

Factors Constraining Commercial Farming of Snail among Farmers in Rural Areas of Rivers State

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Abstract — This study examined the factors constraining the commercial production of snail in the rural areas of Rivers State. The study adopted a descriptive survey design. The study was guided by four research questions. The population for the study were the accessible snail farmers in Rivers state, as 80 snail farmers were purposively sample to answer the research questions. Data were collected using structured questionnaire and structured interview schedule, validated and their reliability established. The data gathered were analyzed using Mean statistics and Standard Deviation. The findings showed that commercial snail production was constrained by factors ranging from finance, environment, lack of technical-know-how to high incidence of pests and diseases. It was therefore, recommended that Government and development stakeholders intervention were needed in areas of credits and education.

Keywords— Constraints, Commercial Farming, Farmers and Rural Areas.

I. INTRODUCTION

Snails' ancestors are one of the earliest known types of animals in the world, there is fossil evidence of primitive gastropods (a mollusk of the large class gastropoda, such as a snail, slug or whelk) dating back to the late Cambrian period, this means that they lived nearly 500 million years ago (Akinbile, 2000). There are many types of snails, but they fundamentally differ because they are either aquatic or terrestrial. The former are adapted to live in the sea or bodies of fresh water, but the latter live exclusively on land, although in humid areas. (Ajibefun & Daramola, 2003).

All land snails are gastropod mollusks, part of the phylum Mollusca, class- Gastropoda and kingdom Animalia. Being a mollusk means Snails lack internal skeleton and bones, but yet not unprotected. The most striking physical feature of snails is their spiral shell that they load on the back. It is a hard structure composed of calcium carbonate, which protects their soft body and internal organs. The biological features of snails are fascinating. For example, most are hermaphrodites, which mean that a single snail has male and female reproductive organs at the same time. However, they usually mate in the "traditional" way with a partner. The life expectancy of snails in the wild is about 3-7 years, but in captivity, they can live up to 10-15 years or even more. (Amao, Adesiyani & Salako, 2007).

Snail meat has been consumed by humans throughout the world since prehistoric times (Yahya, 2012). The interest

in snail farming around the world stems from snails' high quality protein and medicinal value. For instance, protein from snail meat is said to be very rich in all essential amino acids such as lysine, leucine, arginine and tryptophan (Cobbina, Vink & Onwuka, 2008). Snail meat has been found to be higher in protein content (37-51%) compared to that of guinea pig (20.3%), Poultry (18.3%), fish (18%), cattle (17.5%) and swine (14.5%). Iron content is (45.59mg/kg), low in fat (0.005-0.08%), sodium and cholesterol level (Mba, 2008).

The bluish liquid obtained from snail has high iron content and is used for treatment of anemia, hypertension and poor sight, the formulation from this liquid can be used to treat burns, abscesses and other wounds, measles, small pox and some skin diseases (Mba, 2008). In Ghana, the bluish liquid is believed to be good for infants' development (Ashey, Omole and Kehinde, 2001). According to Amao, Adesiyani and Salako (2007), snail meat is recommended in the past for treatment of ulcer, asthma and even at the imperial court, in Rome it was thought to contain aphrodisiac properties (arousing or increasing sexual desire) and was often served to visiting dignitaries in the late evenings. Snail meat being rich in calcium, potassium, magnesium and iron is recommended for a hypertensive and pregnant women. It is important source of protein to human diet, and an additional source of income to farmers in recent times. Snail is one of such micro livestock that has recently attracted attention among farmers in Nigeria

as an aftermath of the alarm raised by FAO on animal protein deficiency among Nigerians. FAO(1986) reported that the average animal protein intake in Nigeria is low, and called for concerted effort towards alleviating the crises of protein shortage. Unfortunately the conventional and regular sources of animal protein supply in the country such as beef, pork, chevon and poultry are getting out of reach of the common populace due to the economic down turn (Ebenebe, 2004). There is therefore the need to look inward and integrate into our farming system some non convention meat sources, as to complement the conventional sources of protein supply.

Snail meat is socially well accepted in many parts of Nigeria. It is commonly known as “Congo meat” and it is also one of the most delicacies in Nigeria. Many species of edible land snails are recognized in Nigeria, but the popular species of economic interest is the West African giant snail (*Archatina Achatina* and *Archatina Marginata*).

They are the biggest land snail that can grow to a desirable size in terms of shape, *Archatina* snails have a pointed apex while the other one have blunted one, and lay many of eggs at a time, (Ebenso, 2002). However, despite these advantages of snail and its production, snail rearing in commercial quantity has been facing by many challenges:

Baba & Adeleke (2006) noted that lack of adequate financial strength is the bane of snail farming in commercial quantities in rural areas where subsistence farming is prevalent. According to them the farmers do not have enough money to procure snail hutch boxes, because of they are expensive. Formulated feed for snail is quite expensive for an average farmer, and poor financial capacity of the farmer to expand the business and the unstable market for snail products are quite challenging (Alamu, 2004).

Mba (2008) observed that short repayable period of credit facilities and inability to access credit due to high collaterals have been part of the financial constraints that has militate against the commercial production of snail in the rural areas.

Aside financial constraint, another limitation to commercial snail farming could be linked to the environment. Environmental factors include the climatic factors, high rate of theft, incidence of wild fire, and insecurity of the area. Unfavourable climate conditions and climate change pose a serious problem to snail population and farming in West African Region. Climatic influence and its effects on snails have an associative effect on temperature, humidity, wind/air movement, light intensity and water logged soil (Ebenso, 2002).

According to Afolabi (2013), the effect of heat occasioned by high temperatures on snails could lead to reduced feed

intake and utilization, reduced egg production, reduce growth rate, low body weight, poor hatchability and fertility. Ebenebe (2004) stated that snails hibernate especially during hot seasons.

Snails enjoy moist and cooler environments, which is usually achieved when it rains, the atmosphere air become moist with high relative humidity. Snail are active at a relative humidity of between 70-90% because it promote good snail activity, growth, feeding while the night dew helps the snail move easily but in the absence of it, the reverse is always the case (Mba, 2008). Snails depend very much on the soil for their food and reproduction. They require moist, aerated, easily drained, non waterlogged soil and non acidic soils. Soil rich in minerals contents and organic matters are good for snail farming, especially if sterilized to kill pathogens (Effiong, 2005).

According to Afolabi (2013), snail farmers are facing the challenges of stealing their products. Most of the stealing take place during the night hours when the farmer(s) might have gone to bed. This has greatly retarded the production of snail commercially, because it discourages the farmers. Another threat to the commercial production of snail is the issue of insecurity in most of the rural areas, (Akinnusi, 2013). Kidnapping, cult clashes and tribal war has displaced so many people in the rural setting, as some snail farms have been abandoned giving way for pilferation by criminals. This condition even discourages intending snail farmers and limiting the expansion drive of those already in business.

Another constraint to commercial snail farming is technical know-how of farmers. Oguniyi (2009) noted that Snail farming as an aspect of micro livestock, requires a scrutiny of technical efficiency for maximum production, because it is the technical process that affects the final output. The evaluation of success of snail enterprise in terms of effective use of inputs and maintenance of a sound cost structure lies in the technical efficiency analysis of the process. Azeez (2009) also opined that one of the constraining factors of the commercial production of snail has been the inadequate technical skills of the farmers who dwell in the rural areas. The technical skills such as skill in the selection of better species: as majority of the farmers lack the ability to select a sexually mature snail with fast growing ability that could reach market size early enough and be able to withstand pest and disease. Others are knowledge of constructing a good snail hutch, handling of snail products, marketing ability (skill) among farmers.

Some lacks the ability to know the kind of natural food for snail such as plantain peel, and other kitchen wastes, how to make the environment better for the growth of snail and skill (knowledge) of harvesting, as many farmer most of

the time sell premature snail, thus leading to low income generation (Effiong, 2005).

Pests and disease have been noted to retard the successful production of snail. Some of the common disease affecting snail include: fungal diseases mainly fusarium spp: this disease commonly referred to as rosy eggs disease turn the eggs reddish brown and eventually lead to the disintegration of it. Bacterial diseases caused by Pseudomonas spp especially Pseudomonas aeruginosa causes intestinal infections in snails which result to poor growth and developmental processes, Alluadihella flavicornis leads to low quality snail (Akinnusi,2013).

Predators such as crows, snakes, centipede, toads, lizard, rats etc inflict havoc on snails by either breaking their shells, bite or sting the snails or eat them as food both their eggs and juvenile stage. Predators adversely affect the commercial production of snail among farmers in the rural areas (Cobbinah, Vink & Onwuka 2008).

Effiong (2005) noted that cannibalism is a great problem in snail farming. This is observed in older snails feeding on the eggs yet to hatch and newly hatchlings as a source of nutrients, especially calcium and water to avoid dehydration and for their survival.

II. STATEMENT OF THE PROBLEM

One of the important alternative sources of animal protein which has received little or no attention in Nigeria is the snail. In Nigeria, especially the rural areas where snail meat is popular, snails are gathered from the forest during the wet season. However, wild snail population has declined considerably primarily because of the impact of environmental factors and human activities and therefore requires alternative means of ensuring constant supply to the market. Despite its high demand occasioned by its nutritive value many farmers appears not willing to venture into commercial production of snail. It is this situation that called for the study of this nature to determine such factors limiting the commercial farming of snail in Rivers state.

III. OBJECTIVE OF THE STUDY

The broad objective of the study is to examine the factors constraining the commercial farming of snail among farmers in rural areas of Rivers State. The specific objectives are:

1. To what extent does finance constrain the commercial farming of snail among rural farmers in Rivers State.
2. Examine the various environmental factors constraining the commercial farming of snail among rural farmers in Rivers State.
3. Determine the extent lack of technical skills constraint commercial snail farming among rural farmers in the study area.
4. Determine the extent disease and pest constraint commercial farming of snail in the study area.

RESEARCH QUESTIONS

1. What are the financial constraints on the commercial farming of snail among rural farmers in Rivers State?
2. What are the environmental factors constraining the commercial farming of snail among rural farmers in Rivers State?
3. To what extent does lack of Technical skills affect commercial farming of snail in the study area.
4. To what extent does pests and diseases constraint commercial farming of snail in rural areas of Rivers State.

IV. METHODOLOGY

Rivers State is one of the 36 states of Nigeria with a population of 5,198,716 making it the sixth-most populous state in the country (NPC, 2006). It has 23 Local Government Areas, and its capital is Port Harcourt. The state is economically significant, as the centre of Nigeria's Oil and gas Industries, which significantly influenced the population and making it potential market for snail products. Rainfall is adequate and the temperature and humidity relatively supports snail production as snail could thrive well in humid soil with enough organic matter. The study employed descriptive survey, and made use of accessible population of snail farmers in Rivers State. The sample size was 80 snail farmers, accidentally selected among snail farmers in the state. A well structured questionnaire and interview schedule were used to gather data. Data collected were analyzed using Mean and standard deviation with criterion mean value of 2.50 and above indicating acceptance.

V. RESULTS AND DISCUSSION

The financial constraints on the commercial snail farming among rural farmers in Rivers State

Table 1 Mean response on the financial constraints on the commercial farming of snail among rural farmers in Rivers State.

S/N	STATEMENTS	Mean	SD	DECISION
1.	Short repayment period makes credit facilities unattractive.	3.47	0.74	High Extent
2.	Production facilities are expensive	3.35	0.55	High Extent
3.	Inability to access credit due to high collaterals	3.77	0.38	High Extent
4.	The expensive nature of formulated feed	3.51	0.77	High Extent
5.	Poor financial capacity for business expansion	3.40	0.97	High Extent
6.	Unstable market for snail product	3.42	0.67	High Extent
7.	Lack of access to supporting programs in agriculture	2.35	0.91	High Extent

Source: Field Survey: 2019

The data on Table 1 showed the financial constraints on the commercial farming of snail. The respondents were of the opinion that commercial farming of snail was constrained by short repayment period of credit facilities (3.47), expensive production facilities (3.35), inability to access credit due to high collateral (3.77), expensive formulated feed (3.51), poor financial capacity for business expansion (3.40), and unstable market for snail products (3.42) respectively. These findings are in line with those of Alamu (2004) who posited that majority of the

farmers do not have enough money procure facilities and other needs in the farm because of their expensive nature, the findings also collaborated that of Baba and Adeleke (2006) who noted that the farmers in the rural areas are not financially buoyant enough to venture into commercial farming as a result of poor income from subsistence farming system practiced by them.

Environmental factors constraining the commercial production of snail among rural farmers.

Table 2 Mean response on the environmental factors constraining the commercial farming of snail among rural farmers

S/N	STATEMENTS	Mean	SD	DECISION
8.	High rate of theft	3.40	0.77	Agreed
9.	Incidence of wild fire	1.90	0.94	Agreed
10.	Insecurity in rural area	3.10	0.77	Agreed
11.	High soil temperature	3.53	0.71	Agreed
12.	Unpredictable rainfall pattern	1.95	0.97	Disagree
13.	Water logged soil	3.63	0.32	Agreed

14.	Poor transportation network in most rural areas	3.58	1.05	Agreed
15.	Low level humidity	3.58	0.71	Agreed
16.	Low soil PH	1.45	0.67	Disagree

Source: Field Survey: 2019

The data on Table 2 showed the environmental factors constraining the commercial production of snail among rural farmers. The findings showed that High rate of theft (3.40), High soil temperature (3.53), insecurity (3.10), water logged soil (3.63), poor transportation network (3.58) and low level humidity (3.58) respectively are the major environmental factors constraining the commercial farming of snail. These findings are in line with Afolabi (2013), who also found that heat occasioned by high temperature could reduce feed in take utilization, egg production, and hatchability respectively. The findings also corroborated that of Mba (2008) who observed that

snail enjoys moist and cool environment with a high humidity of between 70.90% which promotes good snail activity, growth and feeding ability.

On issue of theft and security, the findings were in tandem which those Afolabi (2013) and Akinnusi (2013) who observed that snail farmers were easily discouraged from expansion as a result of insecurity and theft of snail and the farmer uncertain whether or not to continue or abandon the farm.

Lack of technical skills as it constrained commercial farming of snail in the study area.

Table 3: Mean response on to lack of technical skills as a constraint to commercial production of snail in the study area:

S/N	STATEMENTS	Mean	SD	DECISION
17.	Lack of good farm management skill .	3.20	0.73	High Extent
18.	Poor selection of better species of snail.	3.44	0.95	High Extent
19.	Poor knowledge of environmental control in commercial production of snail	3.40	0.77	High Extent
20.	Poor knowledge of feed formulation	3.20	0.78	High Extent
21.	Poor marketing skill	2.25	0.66	Low Extent
22.	Low technical know-how in handling snail products.	2.45	1.16	Low Extent
23.	Poor knowledge of constructing snail hutches and other facilities.	2.00	1.10	Low Extent

Source : Field Survey: 2019

The data on Table 3 showed the extent to which lack of technical skills affect the commercial farming of snail in the study area. The findings showed that lack of good farm

management skill in snail production (3.20), poor stock selection (3.44), poor knowledge of environmental control (3.40) and poor knowledge of feed formulation (3.20) are

the major technical skills constraining, the commercial farming of snail in rural areas. The findings corroborate that of Ogunniyi (2009) who opined that snail farming requires good scrutiny and technical efficiency for maximum production. The result is also in line with that of Azeez (2009) who noted that inadequate technical skills in

the area of selection of better species of snail, poor knowledge of environmental control will always present hurdles the commercial farming of snail.

Pests and diseases as constraints to commercial farming of snail in rural areas of Rivers State

Table 4: Mean response on the extent pests and diseases constraint commercial production of snail in rural areas of Rivers State.

S/N	STATEMENTS	Mean	SD	DECISION
24.	High incidence of pests could lead to high mortality rate of snail	3.58	0.63	High Extent
25.	Incidence of bacteria could lead to high rate of mortality of snail	3.47	0.69	High Extent
26.	High rate of cannibalism among snail	2.60	1.22	High Extent
27.	Challenges of predators such as crow bird.	2.77	0.90	High Extent
28.	Diseases such as Alluadihella flavicornis leads to low quality of snail.	3.20	0.87	High Extent
29.	Fungi infection prevent proper growth of snail	3.42	0.73	High Extent

Source : Field Survey: 2019

The findings on Table 4 showed that pest infestation(3.58), bacteria infection (3.32), and high rate of cannibalism among snail(2.60) could lead to high mortality. Challenges of predators such as crow bird (2.77) is also a major factor constraining the commercial farming of snail in the study area. These findings are in line Akinnusi (2013) who posited that fungi infection caused by *Pseudomonas* spp, especially *Pseudomonas aeruginosa* causes intestinal infections in snail which result to poor growth and development processes, while *flavicornis* leads to low quality snail. The result is also in agreement with Cobbina, Vink & Onwuka (2008) who found that predators such as snake, crow, lizards, rats, etc inflict havoc on snail by either breaking their shells or eat them as food at their juvenile stage. Effiong (2005) also observed high rate of cannibalism by older snails feeding on the eggs and newly hatched snails.

VI. CONCLUSION

Based on the findings, the study concludes that snail farmer would have expanded their production capacity but were constrained by factors ranging from financial, environmental, pest and diseases and lack of technical know-how.

VII. RECOMMENDATIONS

Based on the finding of this study, the following recommendations were made:

1. Snail farmers should have greater access to formal credit facilities from lending institutions in order to expand and improve their production.
2. Government should set up workshop centres in the rural areas where snail farmers will be taught on how to combat environmental factors constraining the commercial farming of snail.
3. Extension agents should assist rural snail farmer during education and linkage services that would enable them

acquire necessary skills in snail farming and have access to credit facilities that would pose less burden.

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