Snail marketing as a means to combating poverty and hunger: the case of edible land snails (*achachatina marginata*) in Jos, Nigeria

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ABSTRACT

Objective: The study examined the profitability and market performance of snail marketers in Jos North Government Area of Plateau State.

Methodology and results: Respondents were drawn from a cross section of snail marketers in six (6) markets. Fifty (50) marketers were selected through a system of random sampling. Data collected through the administered questionnaire were on the socio economic characteristics, profitability and the constraints to potentials of snail marketing as a tool to meeting the United Nation's Millennium Development Goals. Descriptive statistics including, means, and percentages were used to describe the socio – economic characteristics of snail marketers, while gross margin and marketing performance models were used to determine profitability and marketing margin respectively. The result revealed that more than half of snail marketers were women in their youthful ages ranging from 26 to 45 years, with 87.1% and 90.3% and a gross margin of ₦ 199.00 ($1.29 USD) and ₦213.20 ($1.38 USD), for wholesalers and retailers respectively. This is an indication of profitability of snail marketing. Implying that snail marketing is one of the several other forest products that can be used to achieve the MDG target of eradicating extreme poverty and hunger by 2015. The main problems confronting the marketers are low patronage, followed by seasonal supply, poor storage and transport facilities.

Conclusion and application: The study therefore recommended that snail rearing be encouraged for all year round supply of the products to improve the intake of protein through greater consumption while improving the income of the marketers.

Key words: Marketing, Snail, Profitability, MDGs, Poverty and Hunger

INTRODUCTION

The United Nations Millennium Declaration of the year 2000 defined eight Millennium Development Goals (MDGs); the first on the list was to eradicate extreme poverty and hunger. The target was to halve the proportion of people whose income is below $1 a day between 1990 and 2015. However, the reality of the world is that many countries are undeveloped with precarious development indices. More than 1.2 billion people (20%) of the world population survive on less than US $1 dollars per day. (United Nations, 2000)

Nigeria was one of the 50 richest countries in the early 1970s but had retrogressed to the first 25 poorest nations at the threshold of the 21st century. Despite the fact that Nigeria is the sixth largest exporter of crude oil in the world, statistics has shown that poverty indices which was 28.1 in 1980s has risen to 54.4% in the 2004 (Igbozor,

2006). The role of forests in achieving the MDGs has become a pressing issue for those involved in the sector. Some contributions of forest and trees resources to livelihood of rural dwellers include: increase in income by trading in forest products like fruits, nuts and oils, increase in wellbeing, reduced vulnerability (provide biomass) (Beer & McDermott, 1989; Townson, 1995 and Falconer, 1990). Mariara (2009) reported that forests play an important role as an economic 'safety net' that can cushion rural households during periods of economic hardship by providing resources and source of income for both rich and poor people. Thus forests play an important role in household welfare and poverty reduction, with both the poor and rich depending on forests to a certain degree. Adinya (2009) reported that households in the lowest income group in the Cross Rivers state of Nigeria derive about 20% of their income from forests crop, farming and collection activities, while the middle and the upper income household groups earn about 16% and 12% of their income from sales of forests products respectively. Some important forest products include; honey bee, cane rat, mushrooms, bush meat, aquatic organisms like shrimps, fish and caterpillars inside the forest, rivers, streams and lakes. Other plant products excluding timber are: Gum, Tannins, and Medicinal plants (Leaves and roots of trees) (Myers 1992; FAO 1999; Mayer & Brass, 2004).

Snails are said to have high protein content and medically valuable and so for this reasons the demand for snail meat has increased over the years in both domestic and foreign markets. The high iron content of snail meat is considered important in the treatment of Anemia and also for combating Ulcer and Asthma (Efarmspro 2008). Molluscs serve as a significant and essential part of daily diet of Calabar, the Itsekiri, the Yoruba and many other coastal tribes. Mollusks constitute the major source and cheapest form of protein in Nigeria. (Yoloye 1984 & Ademolu *et al.* 2004)

In Nigeria, about 25gm of snail meat will supply 45% of a child's daily protein need, thereby reducing child mortality. In other African countries for example; the addition of 100gm of snail meat to the average Zambian diet would increase the protein by 50%, while about 300gm of snail meat will add to Niger diet by 50% (Fagbuaro *et al.* 2006). The amino acids in the protein of snail meat would complement the cereal source of protein by making good the relative deficiency of Lysine (Brender 1992). France is the world leading consumers of snails, with a consumption rate of 20000 tons a year. 40% is imported from North Africa, China and Taiwan (Bonis 2007).

The study was conducted in six (6) markets areas in Jos North Local Government Area of Plateau state in 2009. The markets were: New, Katako, Main (Terminus), Abuja, Railway and Gada biyu markets. The objectives of the study are: to determine the profitability of snail marketing in the study area and its possibility in combating poverty in the study area and in Nigeria as a whole. Also to assess the constraints to the potentials of snail marketing in Jos North Local Government Area of Plateau State.

MATERIAL AND METHOD

The study was carried out in Jos, the capital of Plateau State with a population of 429,300 inhabitants (National Bureau for Statistics, 2007). The area lies in the southern guinea savannah zone. The mean annual rainfall is between 1460mm – 4800mm annually with temperatures ranging between 10°C to 32°C and a mean relative humidity of 40%. It lies within latitude 9° 5' north and longitude 8° 5' east at an altitude of 1180m above sea level (Ifenkwe & Akalusi 2004). The data were collected through administration of fifty copies of questionnaire which was carefully designed with the view for providing information that certifies the study objectives on the snail marketers. The distributed questionnaires represented 40% of the total snail marketers. The prices of the products were recorded. Data obtained from the questionnaire were analyzed as follows:

Market Performance: The performance of the retail market was measured by the following equation:

$$MM = CP - RP/CP \times 100$$

Where: MM = Market margin, CP =Consumer Price, RP = Retailed Price

 Source: (Iheanacho, 2005)

Gross margin: Gross margin (GM) is the difference between the total revenue (TR) and the Total Variable Cost (TVC) of a unit commodity, it was used to measure the profitability of edible snail market in Jos North LGA and it is expressed as follows:

GM = TR - TVC

Where: GM = Gross Margin, TR=Total Revenue, TVC = Total Variable Cost.

Source: (Olukosi & Erhabor, 2005)

RESULTS AND DISCUSSION
A total of forty-seven (47) copies of the questionnaire were retrieved, representing 94% of the total distributed.

Socio-Economic Characteristics of Snails Marketers: The data presented in this section identified the various interrelated components, such as age distribution, gender, marital status, education and occupation. Together, these components provided the information that led to the effective understanding of snail marketing in the study area.

Age distribution of respondents: Table 1 shows that the majority of snail marketers, both wholesalers and retailers are within the age range of 26 and 45 years

with 83.4% and 75.1% for wholesalers and retailers respectively. This is indicative that most snail marketers are at their youthful and productive ages, and can withstand the vigorous activities associated with snail marketing process. The wholesalers are those who buy the products from collectors/farmers and sale in bulk to retailers, who in turn sale to consumers. The respondents with ages above 46 years represented only 12.9% and 9.3% for wholesalers and retailers respectively. These age groups are less involved in the economic and income generating activities of the study area.

Table 1: Distribution of the respondents according to age

Parameters Age distribution:	Wholesalers (%)	Retailers (%)
15 – 25	3.7	15.2
26 – 35	48.4	53.1
36 – 45	35.0	22.0
Above 46	12.9	9.3

Source: Field survey, 2009.

Gender distribution of the respondents: The results in Table 2 shows that more men than women are involved in bulk selling (72.3%) of snails since it is very tedious to transport snails over very long distance, in addition to the risky and deplorable nature of the roads especially from the east, west and southern parts of Nigeria which are major areas of snail harvesting/production for consumption in the north.

While their women counterparts are more into retailing aspect of the market (80.8%) as it is less rigorous, it involves seating in one location without hustling up and down. The high number of women in retailing of snails helps in supplementing their household incomes. It is in line with the studies of Gaya *et al.* (2006) who reported that more than half of fish retailers in Yola-North Local Government Area, of Adamawa State were women.

Table 2: Distribution of the respondents according to gender

Parameters Gender	Wholesalers (%)	Retailers (%)
Male	72.3	19.2
Female	27.7	80.8

Source: Field Survey, 2009

Marital status of the respondents: Table 3 indicates that majority of respondents (60.5%) and (60.0%) for wholesaler and retailers are married, while 26.5% and 29.3% for both wholesalers and retailers are single, and only 13.5% and 10.7% are either divorced or widows.

Generally, married women are more involved in the snail business as they assist their husbands in household needs during these periods of hardship and economic crises facing developing countries such as Nigeria.

Table 3: Distribution of the respondents according to marital status

Parameters Material status	Wholesalers (%)	Retailers (%)
Single	26.5	29.3
Married	60.5	60.0
Divorced/widows	13.0	10.7

Source: Field survey, 2009.

Educational status of the respondents: Table 4 shows that the majority of the respondents, 80.2% and 76.1% for wholesaler and retailers respectively were educated (marketers who could read and write), only 19.8% and 23.9% were not educated. This implies that more of the unemployed educated youth have found their way into snail marketing as a source of their livelihood. This is a positive development as this has helped to decongest the labor market and improve standard of living to families. This has gone a long way to reduce destitution, prostitution and crime in the communities. This study also reveals the existence of opportunities for intending marketers, thereby providing more employment opportunities.

Table 4: Distribution of the respondents according to education status

Parameters Educational status:	Wholesalers (%)	Retailers (%)
Educated	80.2	76.1
Not educated	19.8	23.9

Source: Field Survey, 2009.

Occupation of the respondents: Table 5 revealed that a larger proportion of the respondents (91.2% and 93.8%) are into snail marketing as a major means of livelihood. This implies that snail marketing is the main activity of the respondents (wholesalers and retailers respectively), other groups of respondents include: snail farmers/marketers 9.8% and 6.2% for wholesaling and retailing respectively, while those who are marketers only constituted 91.2% and 93.8% of wholesalers and retailers respectively. The results indicated that most of the snails consumed in Nigeria are picked or collected in the wild. This is in line with the studies of Ajayi *et al.* (1980), which stated that snails are in abundance in the wild during the rainy season, where they are collected freely from the rainforest and sold cheaply.

Table 5: Distribution of the Respondents according to occupation

Parameters Occupation:	Wholesalers (%)	Retailers (%)
Snail farming	9.8	6.2
Snail marketing	91.2	93.8

Source: Field survey, 2009.

Gross and market margin analyses: Gross margin (GM) measures the level of profit generated from a business or any production activity, after all expenses are deducted. Gross margin was computed for edible land snails for both wholesalers and retailers. The product of a commodity was sold and its corresponding marketing cost was compared. The result from the analysis, as presented in table 6 revealed that trading activities in edible snails in Jos North Local Government is profitable. At the end of trading, to every kilogram of snails sold, wholesaler and retailers go home with ₦199.00 ($1.3) and ₦213.20 ($1.4) respectively. Based on the magnitude of gross margin and their trend in the commodity traded, retailing is more efficient. This means retailers generate higher profit from their sales compared to wholesalers. The gross ratio measures producers' ability to maximize cost or efficiency in input utilization and other costs in production to improve profit. The lower the gross ratio the better is the business, conversely, the higher in gross revenue the worse is the business. In Table 6, the gross ratio of 0.74 for snail retailers market in Jos North market for instance means 74% of the total income generated is used in offsetting production and marketing costs. By implication the profit made from retailing sales is 26% over the capital invested. That is

every ₦1 ($0.01 USD0 invested, generate twenty-six kobo or ₦0.26 "($0.002 USD) as profit, thus raising the earlier Naira invested into ₦1.26.

Profits made by wholesalers and retailers were substantial, however retailers realized higher profit than wholesalers. This is when viewed under the following possibilities. The lack of appropriate storage facilities: there is a limit to which wholesaler can retain snail because they are perishable goods. This is especially the ready cash paid by retailers when snails are alive. In this regards, retailers are likely to obtain higher profits because of the risk they bear as sales are gradual and can take longer periods to exhaust consignments. This situation put the wholesalers at greater risk of trading at lost. Wholesalers usually travel long distance (West, East and Southern Nigeria) to procure products and therefore bear the cost of transport and loading/offloading. These constitute part of their variable cost by reducing profit margin. The volume of sales by wholesalers is higher, as consumers buy in small quantities from retailers, with this market trends, only retailers enjoy the economics of scale from these market. These results obtained are much higher than the result obtained by Anamayi et al. (2005) where the gross margin of 100kg of edible land snails was ₦6,000.00 ($38.96 USD); and Akinyemi et al. (2003) where the gross margin of 100kg of edible land snails' marketers was N2, 977.67 ($19.34 USD) per month.

Table 6: Gross and market margin of 1kg of edible land snail

Parameters	Wholesalers (N)	Retailers (N)
Total revenue (N)	780	1000
Variable cost (VC)		
Snails	560	780
Transport	20.3	4.7
Feeding	0.6	0.67
Security	0.13	-
Loading & off loading	0.13	-
Handling Charges	-	-
Storage	0.26	-
Tax	0.10	1.43
Total variable cost (TVC)	581.03	786.80
Gross margin	199.0($1.3)	213.20($1.4)
Gross Ratio (TVC/TR)	0.74	0.79
Marketing Margin (%)	25.51	21.3

Source: Field Survey, 2009. Exchange rate as 2009 was $1 = ₦154

Market efficiency/performance of snail market: This concept is usually defined to suit one's own conception of the market. To the rural assembler/ snail farmers, marketing efficiency may mean selling his product at the highest possible profit. To consumers it may be getting his commodities at the cheapest price. But if snail prices are too high, this will limit consumer's purchases, which will in turn affect the rural assemblers'/farmers' further production. As a result, marketing efficiency can be seen as movement of snail from assemblers/farmers to wholesalers, retailers and consumers at the lowest cost consistent with the provision of the service consumers' desire.

Marketing performance measures the effectiveness or competence with which the physical aspects of marketing are performed. Such aspects include transportation, storage and other activities meant to reduce wastes and prevent deterioration in quality of snail. An efficient market would have a utility with maximum effectiveness, the best technology available for each marketing job, regardless of cost. The performance of the snail market in Jos is efficient because the wholesalers through the retailers provide snails to the consumers in good conditions (alive and healthy) at the market and available at all times; this transactions is done with the lowest marketing prices possible.

Economic efficiency, on the other hand, requires the realization of maximum output in money terms or of given output with the minimum resources. An efficient market is one that provides goods to consumers in the required form at the required time and place with the

lowest possible marketing cost consistent with the interest of the producer. The Jos snail market is economically efficient because of the regular supply of snail meat at a cheaper cost to consumers. This is due to the negligible cost paid by retailers on security, transport, storage, taxes and other handling charges. Snail meat is also provided to consumers in the required form, time and place, with lowest marketing cost consistent with the interest of the wholesalers and retailers respectively. On the other hand, Eze *et al.* (2006) have reported that snail marketing in Owerri, Imo State was found to be marginally efficient and these may be attributed to the problems of marketing such as the nature of source of supply, poor storability and excessive price paid by consumers per kilogram of snail meat. Marketing margin is the difference between producer and consumer prices of an equivalent quantity and quality of a given commodity (Vanessa & Jonathan 1992). Adekanye (1988) claimed that small margins can be regarded as a proof that distribution or marketing is efficient from these regard; snail marketing in Jos can therefore be seen as efficient because of the small marketing margins of 25.51% and 21.3% for wholesalers and retailers respectively. The low marketing margin is an evidence of efficiency in the snail market in Jos.

Constraints to snail marketing: The results in Table 7 shows that sales duration ranked highest with 32.5% and 34.6% for wholesalers and retailers to completely dispose their consignment within the shortest possible time. The shorter the sale duration of consignments, the better for both categories of marketers. This problem can be traced to lack of information about production and demand of the snails. For instance, sellers may not be able to identify sources of their supplied commodities, while producers (i.e. Rural Assemblers/farmers) may curtail their production as a result of poor patronage, some snails' producers, for instance, keep their snails for longer periods because they cannot get people to buy them. On the other hand, sellers may not know that such snail assemblers/farmers exist. There must therefore be an information system where buyer and seller can be informed of each other's problems. This is followed by seasonal supply with 27.5% and 26.2%; for wholesalers and retailers respectively. The growth of urban centers and the awareness in the consumption of snail meat has created problems of inadequate supply to meet the increased number of consumers. The seasonal variation in price of snail meat is due to lack of storage facilities, processing, preservation and insufficient supply of produce due to lack of snail farms. Most marketers depend on wild picked snails which are mostly abundant during the rainy season.

Transport ranked third with 22.5% and 11.3%, for wholesalers and retailers. This problem has many dimensions. In some cases there are insufficient vehicles to carry goods from the farms to the rural markets and from the rural markets to the towns. In this case, transport accounts for a high proportion of marketing cost. For instance, there are no roads and where they exist, they might be seasonal feeder roads which are usually few and in most cases, have to be constructed and maintained by communal efforts.

Table 7: Constrains to Snail Marketers in Jos North Local Government Area.

Parameters	Wholesalers (%)	Retailers (%)
Seasonal supply	27.5	26.2
Transport	27.5	11.3
Storage	15.0	25.2
Sale Duration	32.5	34.6
Others	2.5	24.0

Source: Fields survey, 2009.

Inadequate storage and warehousing facilities rank fourth with 15.0% and 252% for wholesaler and retailers respectively. Most markets lack storage facilities and warehousing facilities and the amount of loss that occurs due to lack of these facilities often accounts for increasing cost of marketing snails and, hence, higher retail prices to consumers. Other unspecified constraints to marketing land snails were ranked least with 2.5% and 2.4% for wholesalers and retailers respectively. Snails are produced on small-scaled farmers/ wild snail pickers are scattered throughout the country's East, West, South and North-East forest, it is not an easy task organizing how the goods (Snails) can be assembled for efficient

marketing. This is an indication that a good proportion of snails is sourced from the wild which are in abundance during the rainy season. This is in line with the study of Ajayi *et al.* (1980) which stated that snails

are abundant during the rainy season, where they are collected freely from the rainforest, cocoa and rubber plantations and are sold cheaply.

CONCLUSION
From this study, it can be concluded that the snail market in Jos North Local Government Area of Plateau state, is profitable despite the problem encountered by marketers. It was also found that most of the marketers were women in their youthful ages between 26 to 45 years. The study also revealed that more than 90% of snails consumed in Nigeria are collected from the wild.

If well organized, the snail market will have great impact on poverty alleviation particularly among the youth and can lead to achieving the target of the first millennium development goal of halving the proportion of people who live on less than one US dollar per day between 2000 and 2015.

RECOMMENDATION
Based on the findings of this study, the following recommendations are proffered:
• Snail farming should be encouraged by educating the public through seminars and conferences on rearing techniques and adequate knowledge of return on investment.
• Snail farmers and marketers should be encouraged to form cooperative bodies, banks and other micro-finance houses to finance their activities through the provision of credit facilities.
• New processing techniques should be developed on processing and storing of snail meat to make it available all round year.
• High transport fares are a product of rising fuel

price and bad roads. The governments at various levels should address these problems by rehabilitating and were possible construct new roads. This will make road transport easier and will go a long way in reducing fares.
• Government policies towards poverty alleviation and food security should be tilted towards snail farming processing and consumption. This will help in reducing the protein deficiency witnessed on the rural diets and also act as a source of employment to the rural and urban youths.

REFERENCES
Adekanye TO, 1988. The markets for foodstuff in Western Nigeria. In Adekanye, TO. (Ed); Readings in Agricultural marketing. Longman Ibadan, Pp. 12-22.

Ademolu K O, Idowu AB, Mafiana CF, Osinowo OA. 2004. Performance, Proximate and Mineral analyses of African Giant Land Snail (*Archachatina, Marginata).* Fed different Nitrogen Sources. African .Journal Biotech **3**(8) 512-41 7

Adinya I, Ibom LA, Ibekwe HA, Ayabie SA, Ukam VE, Meremikwu VN, Gboshie P, 2009. Analysis of socio-economic constraints militating against the profitability potentials of snail (*Archachatina, Marginata*) production by small-scale farmers in Cross River state, Nigeria. Continental Journal of Agricultural Economics 3:1-15. Wilolud online journals.

Ajayi S.S, Tewo SO, Milligan JK, 1980. Influences of seasonality, on Aestivation and Behaviour of

the Forest African giant Land Snail, *Achachatina marginata* (swaison). Bull Annual Hearth Prod, 28:32-38.

Akinyemi O, Adebayo O, Usman JM, Kihinde AS, Ojo M.O, 2003. An Analysis of Snail Marketing in Ibadan Oyo State, Nigeria. Proceedings of 28th Annual Conference of the Nigerian Society for Animal Production 28: 413-415

Beer J. de and McDermott M, 1989, The Economic Value of Non-Timber Forest Products in South East Asia. Amsterdam: Netherlands Committee for IUCN P6.

Bonis J, 2007. French shellout for organic snails. Telegraph. www.telegraph.co.uk

Brender A, 1992. Meat and meat products in human nutrition in Developing countries. FAO Food and nutrition, Rome. P53

Eze CC, Ohajianya DO, Oguoma NNO, 2006. Analysis of land Snail Marketing in Owerri

Agricultural Zone of Imo State, Nigeria. Animal Production Research advances Institute of Scientific Research and Development **2**(2):94-99.

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

Fagbuaro O, Oso JA, Edward JB, Ogunleye RF, 2006. Nutritional Status of four specifies of Giant Land Snails in Nigeria. Journal of Zhejiang University Science **7**(9): 696- 689.

Falconer J, 1990. The major significance of Minor Forest Products: the local use and value of forests in West African humid forest zone, Community Forestry Note 6. FAO Rome. P10.

Food and Agricultural Organization, 1999. Towards a hormonal definition of non-wood forest product, Unasylva 198: 63-64.

Igbuzor O, 2006. Review of Nigeria Millennium Development Goals- 2005 Report. Action Aid International Nigeria. http://www.dawodu.com/igbuzor11 html

Ifenkwe E. and Akalusi Z, 2004. The effect of length of cutting and hormonal treatment on the Root of *Cassia spectribilis*. Nigerian Journal of Experimental and Applied Biology 5(2):275-282.

Mayers J. and Brass S 2004. Policy that works for forest and people."Real prospects for governance and livelihoods. International institute for environmental development. (IIED), London UK earthscan, p. 122-160.

Mariara JK, 2009. Forest dependence and household welfare: Empirical evidence from Kenya. CEEPA discussion paper No. 4 Making Link between Forests and Poverty Reduction: A resource valuation from Kenya

Myers N, 1992. Tropical forest climate, Kluwer academic publishers. London UK pp. 265

Townson IM, 1995. Patten of Non-Timber forest Products Enterprise Activity in the Forest Zone of Southern Ghana: Main Report. Report to The ODA Forest Research, Oxford Forest Institute, Oxford, PP. 3-7.

United Nations 2000. Resolution adopted by the general assembly on the 55th session agenda item 60(b) 9pp. http://www.un.org/millennium/declaration/ares552e.pdf

Venessa S. and Jonathan K, 1992. Economic Analysis of Agricultural Marketing. Overseas Development and Administration Publishing Company, Pp 1-20.

Yoloye O L, 1984. Molluscs for Mankind, Inaugural Lecture, Ilorin, Nigeria: University of Ilorin; Pp 33.