
NET RETURNS AND STRUCTURE OF GARDEN EGG LEAF MARKETING (*SolanumAubergine*) AMONG SMALLHOLDER FARMERS IN ONITSHA AGRICULTURAL ZONE, ANAMBRA STATE.

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ABSTRACT

The study examined the economics of garden egg leaf marketing (*solanumaubergine*) among smallholder farmers in Onitsha agricultural zone, Anambra State. Specifically it described the socio-economic characteristics, market conduct, market structure, net marketing margin and constraints to garden egg marketing in the study area. Multistage sampling procedure involving purposive and random sampling methods were used to select 4 LGAs from Onitsha agricultural zone, 8 daily markets and 160 respondents (1600 garden egg leaf marketers). Primary data were collected means of structured questionnaire administered to the respondents through enumerators. Data were analyzed using descriptive statistics, mean ranking, net margin and gini-coefficient. Findings on the socioeconomic characteristics showed that there is a high percentage of marketers who sell in the market and also hawk in the streets, events and offices (54.37%) than those who only sell in the market. Findings on market conduct showed that size of the bundle of garden-egg leaf, colour and specie is a determining factor of criteria for purchase for marketers while absence of yellow coloured ones was the least in the study area. Findings on market structure showed that there is high concentration of sales in the hand of few marketers hence existence of imperfect competition. Findings on the net marketing margin showed that for every one naira invested in the enterprise, 1.56k was generated as profit. The findings on constraints revealed that perishability, irregular prices and hazardness associated with hawking were perceived as the most serious constraints to the marketers. Government and relevant authorities should address the menace of hawking mostly for under age and school children and also assisting the small holder farmers in securing affordable storage facility for the leaf were recommended.

Keywords: *Profit, Structure, Marketing, Garden Egg Leaf*

INTRODUCTION

Nigeria has an agrarian economy and Agriculture is the main stay of the economy providing employment to over 90% of the rural dwellers who contribute about 70% of the total population through agricultural output, processing, packaging and marketing Nkamigbo and Isibor (2019). Agricultural sector is an engine room for sustaining growth of Nigeria economy and still remain the mainstay of our economy by providing food for the teeming population, create jobs as well as wealth, raw materials for industrial sector and foreign exchange earnings. Nigeria is one of the sub Saharan African countries of which agriculture was the back bone of her economy before the oil boom of 1970s (Nkamigbo, Isibor and Ekeke, 2021). Nigeria agriculture is the major source of food and accounts for about 35% of the Gross Domestic Product (GDP), 37% of merchandised export, 75% of the rural household income and 70% of employment (Gbughemobi, Nkamigbo and Meludu, 2021).

Garden egg is scientifically known as *Solanum melongena* and belongs to the subgenus *Leptostemonum* (Obeng-Ofori, Danguer and Ofusu-Anim, 2007 and Nwaiwu, Eze, Onyeagocha, Ibekwe, Korie, Ben-Chendo, Henri-Ukoha, Osuji, Kadiri and Ukoha, 2012). Garden egg (*Solanum* spp) is a vegetable with increasing popularity in the world and it originated from tropical Africa. It is an economic flowering plant belonging to the family Solanaceae, whose members are mostly herbaceous plants. Onunka, Chinaka and Ezeh (2011) opined that garden egg is among the oldest vegetables grown for its nutritional, medicinal and economic values of the leaves and the fruits with various varieties of economic importance commonly produced in Southeastern Nigeria. Further stated that garden egg contains a lot of minerals, vitamins, carbohydrates and water substances which are important and highly beneficial for maintenance of health and prevention of diseases. The fruits may be pear shaped, round, long or cylindrical depending on the variety. The genus *Solanum* comprises over 1000 species and almost cosmopolitan with at least 100 indigenous African species. Four cultivar groups are important to Africa which are *Gilo*, *Kumba*, *Shum* and *Aculeatum* while *Shum* is highly cultivated for its leaves Nwaiwu et al. (2012).

Akunneh, Aduema, Iheukwumere and Akunne (2018) stated that *Solanum* species are popularly known as garden egg plants and these plants are made up of leaves, fruits, stems and roots. Many tribes or

ethnic groups have different names, in Igbo, it is called “Aghara” (Anara) or “Afufa”, guata in Hausa, Anyara in Efik, “Nya” in Ibibo and Igbaaja in Youruba. The leaves are extensively used in management of diabetes mellitus. They further stated that the leaves and fruits of garden egg maybe used by patient suffering raised intraocular pressure (glaucoma) and convergence insufficiency. It serves as cardo protection, good source of dietary fiber for free bowel motion, enhancing good skin and hair and useful in management of heart diseases. Omovbude and Ikenwa (2020) stated the leaves of garden are used to cure boils, stomach and throat pains.

MATERIALS AND METHOD

The study was carried out in Onitsha Agricultural zone. Onitsha agricultural zone is located at the southern part of Anambra State at the latitude of 6°05-8°-21 of the equator and longitude 6°.44-7.41E of the meridian. The zone has an estimated population of about 2m people (Wikipedia, 2022). The zone is made up of seven (7) LGAs, Ekwusigo, Idemili North, Idemili South, Ihiala, Ogbaru, Onitsha North and Onitsha South. The landscape of the area is lowland with temperature of 39°. It experiences two major seasons, the rainy season starts at the end of March and lasts till the end of October and dry season covers from the month of November and ends in the month of February. There is a high rate of commercial activities due to the presence of the City of Onitsha and Onitsha main market which is the largest single market in the West Africa Sub-region. There are other several markets in the zone where almost every agricultural produce are marketed both wholesale and retail.

Population and Sampling Technique

The study was made up of all garden egg leaf marketers in Onitsha Agricultural zones, Anambra State, Nigeria. Multistage, purposive and random sampling methods was used to select 4 LGAs, 8 communities, 16 daily garden egg-leaf (Agricultural Food) markets and 160 respondents for the study. The respondents were selected based on the size of the markets. Details of selection process is given as:

Stage 1: Four Local governments were randomly selected from the agricultural zone.

Stage 2: This involves random selection of two communities from each of the selected LGAs making it a total of 8 communities.

Stage 3: This involves random selection of 2 daily markets from the 8 selected communities making it a total of 16 daily markets.

Stage 4: Ten garden egg-leaf marketers were randomly selected from each of the 16 markets selected in stage three making it a total of 160 respondents (markets) for the study.

Method of Data collection and analysis

Data for the study were collected from primary source. Primary data were obtained using structured questionnaire to the respondents from the list of garden egg leaf marketers obtained that constituted the sampling frame for the study. The objectives of the study were analyzed through the following analytical tools. Descriptive statistics such as tables, means, percentages, frequency, gini coefficient, marketing margin and relative importance index.

MODEL SPECIFICATION

Socioeconomic characteristics

AGE= Age in years

GEN = Gender (dummy: male =0; female = 1)

MRS = Marital status

EDU = Educational level

SOF = Source of finance

HOS = Household size (number of persons living together)

TOU = Membership of trade union (dummy: member =0, non-member = 1)

EXP = Marketing experience

MKS = Marketing cost

Gini-coefficient is being calculated as follows:

Gini -coefficient = $1 - \sum XY$

Where:

X= the ratio of percentage of onion marketers

Y= the ratio of cumulative percentage of their income

\sum = summation sign.

Marketing margin and marketing efficiency models were adopted from Mendoza (1995) as applied by Kadurumba, Mejeba and Nwaru (2021) and are specified as:

$NR = TRS - TMC$ -----(1)

Where, NR= Net returns measured as the difference between the total revenue and the total cost of fresh pepper marketing. TRS= Total Revenue sales which is obtained by calculating the total amount (₦)

realized from the sales of fresh garden egg leaf, TMC= Total marketing cost is the sum of the total cost incurred in marketing fresh garden egg leaf. Marketing margin is one of the indicators usually identified with marketing efficiency, the formula is specified thus:

$$M_m = \frac{S_p - P_p}{S_p} \times \frac{100}{1}$$

Where M_m = Marketing margin (₦), S_p = selling price (₦), P_p = Purchase price (₦) .

Marketing efficiency describes the movement of goods from producer to consumers at lowest marketing cost consistent with the provision of the services that the consumers' desire and can afford specified as thus:

$$M.E. = \frac{\text{Value added by marketing (net return)}}{\text{Total marketing cost (TMC)}} \times \frac{100}{1}$$

For processors, cost and return analysis were used for profitability, thus
 $NR = TRS - TMC$

Constraints to Garden egg-leaf marketing

The respondents were asked to rate the problems the face in garden egg leaf marketing from a list of problems compiled by the researcher. The relative importance index will be used in determining the degree of importance of the problem as follows: Very important =4, Important =3, moderately important =2, Not important = 1. The responses on constraints to garden egg leaf marketing will be disaggregated as follows:

Where:

$$RII = \frac{\sum W}{A * N}$$

RII = Relative importance index

W = Weighting given to each factor by the marketers (ranging from 1-4)

A = Is the highest weight

N = Is the total number of marketers.

To make inferential statement, the mean score were compared with the critical mean, 2.5. If the calculated mean of a problem is greater than the standard critical value, then the problem is regarded as very serious.

RESULTS AND DISCUSSION

Socioeconomic characteristics of Garden Egg-Leaf Marketers

Socioeconomic characteristics of marketers in Table 1 indicates that majority of the marketers are within the age limit of 25-35 years (56.25%). The implication of this is that they are energetic and relatively young. Some of these young ones are children whose parents were in the enterprise who find it as a means of survival for themselves both hawking and selling in the market for either for their parents or for themselves. There is a presence of female dominance and married folks among the marketers. It was discovered that there is no marketer who does not know how to read and write in the study area. This contradicts Idris, Chinda and Ahmed (2018) who reported that 47.5% of the marketers of onion in Adamawa had no formal education. Due to the nature of the enterprise, many kick started their business with the money they saved (75.63%). This is at variance with Ekeke, Isibor and Nkamigbo (2021) who opined that friends and relatives were instruct mental for resources for kick-off finance for actors in advancing agribusiness using social network in Anambra State. From the result 5-8 persons living and eating from the same pot recorded a high percentage of (50.63%). It was discovered that in order to attract customers 91.87% of the marketers brands their products for quick sales. This puts them at edge to other marketers. Also the study reveals that 47.5% of the marketers have 1-5 years' experience in the enterprise. The reason is that children of the marketers sees it as a business they can easily start on themselves so there's always new entrant to the enterprise. There is a high percentage of marketers who sell in the market and also hawk in the street, events and offices (54.37%) than those who only sell in the market. The study also revealed that marketers have other business enterprise (76.87%) they engage on.

Market Conduct of Garden Egg Leaf Marketers

The distribution of conduct of garden egg leaf marketers is shown in Table 2. The result showed that size of the bundle of garden-egg leaf (45%) and colour and specie of garden-egg leaf (44%) is a determining factor of criteria for purchase for marketers while absence of yellow coloured ones (6.87%) was the least in the study area .This is in agreement with Nkamigbo, Ugwumba and Okeke (2019) who reported that marketers considered size of the fruits, well ripped and mature watermelon as a criteria for purchase. The result also revealed that marketers used common techniques of fixing prices through consideration of purchase price and other expenses incurred in marketing

of garden egg leaf. This supports the findings of Nkamigbo and Isibor, (2021). The findings also revealed that weight of the bundle of garden egg leaf (65.25%) was a criteria used for purchase marketers from the supplier while leaf without distortion (45.62%) was a strategy used by end users in purchasing the product in the study area.

Table 2: Market conduct of garden egg leaf marketers

VARIABLES	F	%
CRITERIA FOR PURCHASE		
Colour and specie of garden-egg leaf	44	27.5
Size of the bundle of garden-egg leaf	45	28.12
Freshness of garden egg leaf	39	24.37
Lack of wounds, decay, cut or diseased	21	13.12
Absence of yellow coloured ones	11	6.87
Total	160	100
STRATEGIES OF FIXING SELLING PRICES		
Fix price as you like (Arbitrary)	54	33.75
Fix prices through consideration of purchase price and other expenses incurred.	83	51.87
Fix prices through bargaining with wholesalers, retailers and consumers (demand and supply push)	23	14.37
Fix price by garden egg leaf union	-	
Total	160	100
PURCHASE STRATEGIES FROM SUPPLIER		
Weight of the bundle of garden egg leaf	90	65.25
Direct from the garden	70	43.75
Total	160	100
SELLING STRATEGIES TO BUYERS		
Leaf without distortion	73	45.62
Well-arranged and size of the garden leaf	49	30.63
Cleanness of garden egg leaf	38	23.75
Total	160	100
STRATEGIES USED IN ATTRACTING CUSTOMERS		
Neat environment	78	48.75
Good rapour with customers (mannerism)	82	51.25
Total	160	100

Source, field survey, 2023.

Market structure of garden egg-leaf marketers

To measure the degree of seller concentration of marketers of garden egg-leaf, gini coefficient was employed through the value of monthly sales. The result of the analysis of market structure using gini coefficient was shown in Table 3. The result revealed a gini coefficient 0.7758. This implies there is a high level of income inequality (sales margin) in the distribution of income among the marketers and also high concentration

of sales in the hand of few marketers. Hence there is existence of imperfect competition in the marketing of garden of garden egg leaf in the study area. This is also an indication that some marketers can influence the price in the market. This is in tandem with Haruna, Nkegbe and Ustarz (2012) and Isibor, Nkamigbo and Ekeke, (2020) who reported a gini coefficient of 0.58 and 0.64 for wholesalers and retailers of tomato marketing in Ghana and 0.726 (high concentration) among actors using social network in advancing agribusiness. This is at variance with Illo, Kaka, Hassan, Umar and Bamidele (2016) and Ogaje (2020) who reported a gini coefficient of 0.026, 0.103 and 0.3245 respectively for wholesale, retailers of onion marketing and small scale soybean marketing which is a low market concentration.

Table 3. Estimated Gni coefficient of garden egg leaf marketing.

Monthly Sales (N)	F	Pro of WT _s X _i	Cum. Of WT _s (N)	TMS (N)	Cum. Pro of TMS Y _i	X _i Y _i
200,000-650,000	60	0.3750	0.3750	334,965.0	0.1686	0.0632
651,000-1101,000	49	0.3062	0.6812	474,075.64	0.2386	0.0730
1102,000-1552,000	32	0.2000	0.8812	432,521.86	0.2177	0.0435
1,553,000 and above	19	0.1187	0.9999	744,937.5	0.3750	0.0445
	160			1,986,500.00		0.2242

Key Note: Pro= Proportion. Cum=Cumulative. TMS=Total monthly sales. Source: Field survey, 2023.

$$GC = 1 - \sum X_i Y_i$$

$$1 - 0.2242 = 0.7758$$

Net returns of garden egg leaf marketers

Marketing margin is the difference between purchase price and price received on resale Olukosi and Isitor, 1990 as applied by Sulumbe, Shettima and John (2015). The marketing margin reflects the effect of the product characteristics on the complexity of the marketing functions that must be performed as the product passes through the marketing system. From the result of analysis the marketing margin was 40.3% which is below 50% indicates an average return on investment in providing the marketing services. This is at variance with Sulumbe et al. (2015) who reported a market margin of 27.27% which implies that the marketers gets a fair share of the profit realized in the marketing of garden egg leaf in the study area. The marketing efficiency analysis showed that the marketers had an efficiency of 152.4%. This implies that they are efficient

in performing their marketing functions. This agrees with Sulumbeet *al.* (2015) who reported a marketing efficiency of 132% and 129% for wholesalers and retailers of onion marketing in the study area. The net return per naira invested was 1.56%. The implication of this is that for every one naira invested in the enterprise, 1.56k was generated as profit. This implies that garden egg leaf marketing is profitable in the study area.

Table 4: Net returns of garden egg leaf marketers (average quantity/week)

Variables	Quantity (1 bundle/25 kg)	Unit cost(₦)	Total cost (₦)
Purchase	204	6,500	1,644,400.00
Transportation			33,850.00
Loading		350.00	71,400.00
Miscellaneous			11,784.7
Total variable cost			1,761,434.7
FIXED COST			
Selling point rent			18,334.4
Depreciation and Taxes			9,334.2
Total market cost			1,789,103.3
Selling price		13,500.00	2,754,000
Revenue			2,754,000
Net return (TR-TC)			964,896.7
Performance indicators			
Marketing margin			40.3%
Marketing efficiency			152.4
Return on Naira investment (₦)			1.56

Source, field survey, 2023.

$$M_m = \frac{S_p - P_p}{S_p} \times \frac{100}{1}$$

$$= \frac{2,754,000 - 1,644,400.00}{2,754,000} \times \frac{100}{1} = \frac{1,109,6000.00}{2,754,000.00}$$

$$= 40.3\% \text{ marketing margin}$$

Marketing efficiencyn

$$= \frac{\text{value added by marketing (Net Return)}}{\text{Total marketing (TMC)}} \times \frac{100}{1}$$

$$= \frac{964,896.7}{1,789.103.3} \times 100$$

$$= 152.4\% \text{ marketing efficiency}$$

Constraints to garden egg leaf marketing

The constraints associated with garden egg leaf in the study area were shown in Table 5. The findings show that perishable nature of garden egg leaf was the most perceived constraints to garden egg leaf marketing in the study area. This is at variance with Alawode and Abegunde (2016) and Nkamigbo, Chiekezie and Ozor (2020) who reported that perishability is not a major factor in the marketing of pepper in their study area and marketing of fresh tomato in Nnewi metropolis. Inadequate price control (irregular prices) was also reported as one of the major constraints. This is in tandem with Alawode and Abegunde (2016), Onyia, Chiemela, Ujah and Onah (2021) and Isibor and Nkamigbo (2023) opined that irregularity affected fresh vegetables marketing like pepper, leafy vegetables and tomato in their various study area. Most garden egg leaf marketers are fond of carrying their products from street to streets, offices, places of events in order to make much sales than staying in the market. This has resulted to various hazardness like accident on the way and exposure to wrong people in terms of minor who hawk for their parents to make end meet. Low patronage rank fourth among the most perceived constraints in the marketing of garden egg leaf. Unperceived sit at home due to clamor for freedom in the South east do affect the product which will begin to decay after a long time of sit at home that was not planned. Other constraints of garden egg leaf marketing that are not among the most serious challenges were seasonality of garden egg leaf, inappropriate storage facilities and temporal selling point among the marketers.

Table 5 Constraints to garden egg leaf marketing

Constraints	Mean score	Rank
Seasonality of garden egg leaf	2.96	5 th
Inadequate price control (Irregular prices)	3.15	2 nd
Inappropriate storage facilities	2.49	6 th
Perishable nature of garden egg leaf	3.58	1 st
Low patronage	3.01	4 th
Hazardness associated with hawking	3.06	3 rd
Temporal selling point	2.40	7 th

Source, field survey, 2023.

SUMMARY

Findings on the socioeconomic characteristics showed presence of female dominance and married folks among the marketers. It was discovered that in order to attract customers 91.87% of the marketers brands their products for quick sales. This puts them at edge to other marketers.

Findings on market conduct showed that size of the bundle of garden-egg leaf and colour and specie of garden-egg leaf is a determining factor of criteria for purchase for marketers while absence of yellow coloured ones was the least in the study area.

Findings on market structure showed that there is a high level of income inequality (sales margin) in the distribution of income among the marketers and also high concentration of sales in the hand of few marketers. Findings on the net marketing margin showed that the marketing margin was 40.3% which is below 50%, indicates an average return on investment in providing the marketing services. The net return per naira invested was 1.56%. Perishable nature of garden egg leaf, inadequate price control (Irregular prices), Hazardness associated with hawking and low patronage were perceived as the most serious constraints to the marketers.

CONCLUSION

Garden egg leaf marketing among smallholder farmers in Onitsha agricultural zone, Anambra State is a profitable venture given the positive values of gross margin, net returns and return on investment. The marketers are efficient in the enterprise. The level of profitability would improve if adequate measures are taken to address the marketing constraints by relevant authorities.

RECOMMENDATION

- i. Government and relevant authorities should address the menace of hawking mostly for under age and school children.
- ii. Relevant authorities should assist the small holder farmers in securing affordable storage facility for the leaf.
- iii. Irrigation among small holder garden egg farmers should be intensify for all year round production.

CONTRIBUTION TO KNOWLEDGE

- i. The study established that garden egg leaf marketing is a profitable enterprise and as a means of survival.
- ii. The study established that marketers are efficient in the marketing.
- iii. The study reported a near imperfect competition in the market structure of garden egg leaf.
- iv. The study noted that perishability, irregular prices and hazardness associated with hawking were perceived as major constraints.

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