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MARKET ANALYSIS OF GARDEN EGG (solanum melongena) IN ANIOCHA SOUTH LOCAL GOVERNMENT AREA OF DELTA STATE, NIGERIA

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ABSTRACT

This study investigates the economics of garden egg (Solanum melongena) marketing in Aniocha South Local Government Area of Delta State, Nigeria. A structured questionnaire was used to collect data from a random sample of 100 garden egg marketers. Analytical tools, including descriptive statistics, budgetary techniques, and, were employed to achieve the study objectives. The socioeconomic characteristics of the marketers revealed a significant gender imbalance, with 75.0% being female. The majority falls within the age range of 30-40 years, possess at least a secondary school education, and have 11-15 years of marketing experience. The average household size is 8.17, and 45.0% are members of a cooperative association. The marketing channels analysis indicates that 59.0% of marketers are retailers, emphasizing a retail-centric structure. Most marketers (72.0%) sell directly to consumers, and a majority (54.0%) purchase garden eggs in quantities above 10 bags. The study on costs and returns reveals a profitable venture, with a positive profit margin of N132, 500 and a profitability index of 33.8%.

Keywords: Market, Analysis, Garden Egg, Marketing.

1. INTRODUCTION

Garden eggplants are fruit vegetables of some varieties which are white and shaped like chicken eggs, hence the name ‘eggplants’ and the fruits may be pear-shaped, round, long or cylindrical depending on the variety (Kainga, 2013). The plant with the scientific name *Solanum* spp. is a vegetable with the increasing popularity in the world. It is an economic flowering plant belonging to the family *Solanaceae* and genus *Solanum*. It exists in about 1,400 species found around the world most especially in the temperate and tropical regions (Adakarem, 2014). The genus *Solanum* comprises over 1,000 species with at least 100 indigenous African species (Chamo, Karate & Rabu 2016). Production of garden egg is highly concentrated with 85% of the output coming from five (5) countries of which China is the world largest producer (56% of garden egg output), followed by India (26%), Egypt, Turkey and Indonesia (Adakarem, 2014). Four cultivar groups are recognized within the *Solanum* species, three of which are important for Africa Plant Resources of Tropical Africa (Adakarem, 2014). African garden egg is one of the most commonly consumed fruit vegetable in the tropical Africa, in quantity and value and probably, the third after tomato and onions and before okra. In Nigeria, different local species/varieties are in existence and are grown by different ethnic groups for local consumption and other uses (Adesina & Kehinde, 2018). The fruits can be eaten raw as a vegetable, it could also be boiled, fried and stuffed before consumption (Laleh, Farhad, Seyed and Najafabad, 2017). Garden egg vegetables are mostly annual crops belonging to the group of plants called horticultural crops which are diverse in nature. However, vegetables can be grouped into fruit and leafy vegetables depending on the nature of their consumable products or parts (Okonkwo-

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Emegha, et al., 2020). Fruit vegetables are those that produce fruit such as okra, tomato, garden egg, leafy vegetables are those whose leaves are the desired parts, and so on lettuce, spinach, cabbage, cauliflower, parsley, and so on (Okonkwo-Emegha, Isibor & Adejoh, 2024). Consuming high amounts of garden eggs has been found to be beneficial for people with glaucoma because it lowers the eye pressure (Ozobia, 2013). Vegetables (leafy and fruits) are widely grown in most parts of Sub-Saharan Africa, especially in the urban areas, and they constitute the most affordable and sustainable source of micronutrients in diets. In Nigeria, markets and other business activities have been affected negatively through exploitation of environmental resources which has led to insufficient supply and low income (Emegha, 2023). Garden egg (Solanum spp) is a vegetable with increasing popularity in the world (Laleh, et al., 2017). It originated from tropical Africa, and is an economic flowering plant belonging to the family *Solanaceae*, whose members are mostly herbaceous plants. The fruit is berry; the seeds have large endosperm, and are grown mainly for food and medicinal purposes. Nutritionally, garden egg contains water (92.5 %), protein (1 %), fat (0.3 %), and carbohydrates (6 %). Medicinally, a meal of garden egg is proven to be of benefits to patients suffering from raised intraocular pressure (glaucoma) and convergence insufficiency, as well as in heart diseases and *arteriosccerosis* (Okonkwo- Emegha, Achoja & Okeke, 2019). The crop is widely cultivated across most of the African continent, and more intensively in West and East Africa. It is consumed almost on daily basis by urban families and also represents the main source of income for producing households in the forest zones of West Africa (Okonkwo- Emegha, Umebali & Obiekwe 2025). The economic and nutritional value of garden egg is of great importance; its production cannot only be sustained only through a particular season, since it is becoming increasingly unable to meet the food need of Nigeria (Okonkwo-Emegha, 2025). Several studies have been carried out on garden egg production in Nigeria and African at large. Nkamigbo, Isibor, Obiekwe, & Udemba, (2023) in their work market structure and market conduct of garden egg fruits marketing in marketing in Onitsha Agricultural zone, Anambra state, Nigeria. They reported that the findings from gini coefficient revealed 0.7155 and 0.7488 for wholesalers and retailers. Despite all these studies in garden egg marketing none of these studies have been able to establish the fact that the marketing is profitable in Aniocha South Local Government Area, Delta State, Nigeria. It is this gap that this research sought to fill by examining the economics of garden egg marketing in Aniocha Local Government Area of Delta State. The broad objective of this study was to analyze the economics of garden egg marketing in Aniocha South Local Government Area, Delta State. The specific objectives of the study were to: describe the socio-economic characteristics of garden egg marketers; identify marketing channels of garden egg and estimate costs and returns of garden egg marketing.

2. LITERATURE REVIEW

Marketing Channels of Garden Egg

Agricultural commodities move in the marketing chain through different channels and it consists of individuals, firms who involved in the process of making a product or service available for use or consumption by consumers or industrial users. Marketing Channels are set of interdependent organizations who involved in the process of making a product or service from the producer available for use or consumption by the ultimate consumer (Arene, 2016). Marketing channel serves as alternative routes of products flow from producers to consumers. As the marketing process becomes complex, more intermediaries come between the producers and the consumers.

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These marketing intermediaries constitute the marketing channels. The channel structure reveals the kind of participants involved in the production and ultimate user of the product. The length of the marketing channel depends on the size of market, nature of the commodity and the pattern of demand at the consumer level (Olubunmia, et al., 2019). (Kotler, et al., 2012) describes a zero channel (direct marketing channel) as consisting of producers selling directly to consumers. The channels are outlined below:

Producer---------- wholesaler-----retailer----consumer
Producer----------wholesaler------consumer
Producer----------retailer------consumer
Producer----------consumer

Concept of Marketing Conducts

Market conducts refer to the actions which firms follow in adopting or adjusting to the market in which they buy and sell. It comprises of various methods employed by groups of firms in determining price and output, sales promotion policies; other tactics that are directed at altering the nature of product sold and various selling strategies that are employed to accomplish specific market objectives (Olukosi, et al., 2005). Hence, market conduct resembles the behavioral patterns of enterprise. Thus, given the structure of the market, market conducts determine the outcome. Market conduct is more or less influenced by market structure. The conduct of the market shows the policy of the firm with respect to pricing, product market, relationship with competitors, advertising and marketing channel (Olubunmil, et al., 2018). In developing countries like Nigeria the dynamics of culture and local economic conditions has affected marketing system effectively (Emegha, Ofobuike & Ochuba, 2025). The society is a single inter-connected system in which each of its elements (marketing) performs a specific function in the maintenance of the system equilibrium (Emegha, 2020),

Basic Concept of Garden Egg

Garden egg (Solanum spp) is a vegetable with increasing popularity in the world and it originated from tropical Africa. It is an economic lowering plant belonging to the family Solanaceae, whose members are mostly herbaceous plants. The fruit is berry; the seeds have large endosperm, and are grown mainly for food and medicinal purposes. Thus, decision making does not relate to one issue or question but to a number of issues such as production, marketing, consumption, value chain ans so on (Elech, Offor, & Emegha, 2019).

However, garden egg can be grouped into fruit and leafy vegetables depending on the nature of their consumable products or parts. Fruit vegetables are those that produce fruit such as okra, tomato, garden egg (Okonkwo-Emegha, Isibor, & Adejoh, 2024). On the other hand, leafy vegetables are those whose leaves are the desired parts for examples lettuce, spinach, cabbage, cauliflower, parsley, also garden egg leave and so on, which the cultivation during the dry season with the aid of irrigation is termed dry season vegetable farming (Okonkwo-Emegha, et al., 2020). Consuming high amounts of garden eggs has been found to be beneficial for people with glaucoma because it lowers the eye pressure (Ozobia *et al*, 2013). Eggplant nutritious value is comparable to the values of other common vegetables. Its fresh weight is composed of 92.7% moisture, 1.4% protein, 1.3% fibre, 0.3% fat, 0.3% minerals, and the remaining 4% consists of various carbohydrates and vitamins (A and C). It also contains water (about 92.5%), protein

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(1%), fat (0.3%), and carbohydrates (6%). Similarly, eggplant contains nutrients such a dietary fiber, folate, ascorbic acid, vitamin K, niacin, vitamin B6, pantothenic acid, potassium, iron, magnesium, manganese, phosphorus, and copper (Okonkwo-Emegha, Achoja, & Okeke, 2019). The crop is usually intercropped with okra, tomato and hot pepper under rain-fed conditions and often results in reduction of yield of both component crops possibly due to similarity in the growth pattern and duration. The crop is widely cultivated across most of the African continent, and more intensively in West and East Africa. It is consumed almost on a daily basis by urban families and also represents the main source of income for producing households in the forest zones of West Africa (Okonkwo-Emegha & Isibor., 2023).

Concept of Marketing Structure

There is an established relationship between a direct, casual and deterministic market structure, and conducts (Anuebunwa, Lemchi & Njoku, 2016). Market structure may be defined as the characteristics of the organization of a market which seem to influence strategically the nature of the competition and pricing within the environment in which a firm operates. Market structure consists of characteristics of a market and determines the conducts of that market. It therefore influences the nature of competition as well as the pricing mechanisms within the market and thereby determining the level of market performance (Agbugba, 2018). Market structure is thus the physical dimensions involved in market organization, that is, the approximate definitions of industry and markets, the number of firms in the market, distribution of firms by various measures such as size and concentration, the description of products and product differentiation, and entry conditions. Market structure can thus be studied in terms of the degree of sellers and buyer concentration, the degree of product differentiation, the existence of entry and exit barriers, and the control of the distribution (Okonkwo-Emegha, Isibor & Ibemere, 2023). Market structure is most commonly evaluated by examining trends in the numbers and sizes of firms relative to each other, and to number of consumers and producers, in particular times and places. Estimating the numbers, size and spatial distributions of each category of intermediary provides an indication of both the local structure of the market, and the range of alternatives faced by participants in the marketing chain in their buying, selling and hiring functions (Egesi & Ebe, 2021). Perfect competition, monopolistic competition, oligopoly, oligopoly and monopoly are the major market structures. Perfect competition, oligopolistic competition and monopolistic competition were the three basic theoretical market models often used in analyzing market structure ((Okonkwo-Emegha, Isibor & Ibemere, 2023). Among the major structural characteristics of a market is the degree of concentration, that is, the number of market participants and their size distribution and the relative ease or difficulty for market participants to secure an entry into the market. In garden egg marketing as well as other food marketing enterprises, very large number of marketers at each end of the marketing channel is suggestive of competitive conditions (Okonkwo-Emegha, Achoja & Okeke, 2019). Therefore, the focus in analyzing market structure is on the numbers and sizes of enterprises within the system, and the potential access of additional participants to it. A high number of buyers and sellers along the marketing chain, ease of entry into all functions, and widely available market information, together carry a strong presumption of competitive conditions. The structure of a market determined the efficiency of its marketing system (Agbugba, 2014).

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3. METHODOLOGY.

Research Design

This study employed survey design and was chosen because it is a social research (Okonkwo-Emegha, et al, 2019).

Study Area

Delta State

Delta State was created from the former Bendel State in 1991 with Asaba as its capital city. The state lies between longitude 5°N and 6°45'N East and latitude 5° and 6°30' North, shares boundaries with Edo State to the South-west, Anambra to the East and Bayelsa state to the south. The state has a population of 4,098,391 by the census figure of 2006 (NPC, 2006). The state is made up of different ethnic groups, The Urhobos, Igbos, Izons, Itsekiri and The Isokos. It is made up of 25 local government areas with three agricultural zones namely: Delta North, Delta Central and Delta South.

The study was conducted in Aniocha South Local Government Area Delta State, Nigeria. Aniocha South is a humid (260) tropical rain forest zone, it is located between longitude 6° 45' 1" E and latitude 6° 1' 53" N. (www.anambrastate.govt.ng 2015). The state has an average annual rainfall of about 2667mm in the coastal areas and 1905mm in the northern areas. The rainfall is heavier in July with a short break in August. The state has an annual average temperature range of 29°c to 38°c. It has an estimated land area of 17,698 square kilometers which 1770km^2 is made up of fresh water swamp, 5840km^2 of mangrove swamp and 10088km^2 of rainforest. Thus, with abundant ground and surface water resources in the state. There is potential for production of crops, fish and livestock and marketing of vegetables in the area. The major economic activities of the people are farming. The crops grown are tree crops such as rubber, oil palm, tuber crops, cereals and assorted vegetables. The local government area has 18 communities which include: Ogwashi- uku, Ubulu- Uku, Ubulu-Uno, Ashama, Abah Unor, Aboh -Ogwashi, Isha -Ogwuasi, Oloh Ogwashi, Azagba Ogwashi, Isheagu, Adonte, Egbudu-Akah, Ejeme-Aniogor, Ejeme- Unor, Ewulu, Nsukwa, Ubulu-Okiti, Ukwu-Oba and Umute.

Population to the Study

The population of the Study were all the registered (1,055) garden egg marketers in Aniocha South Local Government Area (LGA) of Delta state.

Sampling Procedure / Technique

Two stage sampling techniques were used in selection of the garden egg marketers for the study.
In stage 1, five communities will be randomly selected -Ogwashi- uku, Ubulu- Uku, Ubulu-Uno, Ashama and Abah Unor.

In stage 2, twenty (20) garden egg marketers from each of the selected communities were randomly selected, making it a total of (100) respondent that were selected for the study.

Method of data Collection

Data for the study were collected through primary and secondary source. The primary source would be through the use of constructed questionnaires with questions stemming from the objectives in order to get a valid data to facilitate a proper research work which would be

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administered to the garden egg marketers. The secondary source of data collection will be done by reviewing of related books, journal, article, and internet and reports to get information and it was referenced properly.

Validity of instrument for Data collection

To ascertain the Validity of the instruments, the initial drafts were given to three lectures from the faculty of agriculture for face and content validity.

Data Analysis

Descriptive statistics such as frequencies, percentages, mean and Gross margin were used to achieve the objectives.

4. RESULTS AND DISCUSSION

Socioeconomic characteristics of garden egg marketers

The result of the socioeconomic characteristics of the farmers is presented in Table.1.

Sex: the study revealed that the majority (75.0%) of marketers are female, while the remaining 23.0% are male. This indicates a significant gender imbalance among garden egg marketers.

Age: The majority of garden egg marketers fall within the age range of 30-40 years, contributing to more than half of the participants, the remaining 30.0% are less than 30 years, and the last 12.0% are above 60 years. The mean age is approximately 31.84 years, this suggests that garden egg farmers are very young and in their active farming years.

Marital Status: The largest group is the married individuals (55.0%), while single (26.0%) individuals and those who are divorced (12.0%) or widowed (7.0%) form smaller proportions.

Level of Education: A majority of garden egg marketers have at least a secondary school education (57.0%), while 15.0% have no formal education. Another 18.0% completed primary school and the last 10.0% attended tertiary education.

Marketing Experience (years): The majority of marketers have 11-15 years of marketing experience, with a mean experience of approximately 12.02 years. The remaining 24.0% have 16 years and above, 20.0% have 6 – 10 years of marketing experience, and the last 10.0% have less than 6 years of marketing experience.

Household Size: The majority of marketers (56.0%) have a household size ranging from 6 to 10 people, with a mean household size of approximately 8.17. another 23.0% have less than 6 people, and the last 21.0% have 11 people and above. The average household size is large enough to supply cheap family labour.

Cooperation Association: Almost half of the marketers are part of a cooperation association (45.0%), and the last 55.0% are not members of any cooperation. These 45.0% that are members of the cooperative are enjoying the principles of cooperative bulk purchase. This is in line with

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the findings of Okonkwo-Emegha, Umebali & Obiekwe, (2025) who reported that cooperative society is the major association of vegetable farmers and marketers.

Table 1: Socioeconomic characteristics of garden egg marketers

Socioeconomic characteristics	Frequency	Percentages (%)	Mean
Sex:			
Male	23	23.0%	
Female	75	75.0%	
Age:			
Less than 30 years	30	30.0%	
30-40 years	58	58.0%	31.84
Above 60 years	12	12.0%	
Marital Status:			
Single	26	26.0%	
Married	55	55.0%	
Divorced	12	12.0%	
Widow/widower	7	7.0%	
Level of education:			
No formal education	15	15.0%	
Primary school	18	18.0%	
Secondary school	57	57.0%	
Tertiary education)	10	10.0%	
Marketing Experience (years):			
Less than 6	10	10.0%	
6-10 years	20	20.0%	
11-15 years	46	46.0%	12.02
16 and above	24	24.0%	
Household Size			
Less than 6	23	23.0%	
6-10 people	56	56.0%	8.17
11 and above	21	21.0%	
Cooperation association:			
Yes	45	45.0%	
No	55	55.0%	

Source: Field survey, 2025.

Marketing Channels of Garden Egg Marketers

The marketing channels of garden egg marketers are presented in Table 2. The result is discussed as: Position in the Market: The majority of garden egg marketers are retailers, constituting 59.0% of the market. This suggests that the enterprise is largely dominated by individuals engaged in direct sales to consumers. 29.0% and 12.0% are producers and wholesalers respectively.

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Marketing Channels: The breakdown of marketing channels reaffirms that a significant portion of marketers (59.0%) are engaged in retailing. Producers/suppliers and wholesalers make up 29.0% and 12.0%, respectively. This distribution indicates a market structure where a substantial number of garden egg marketers operate at the retail level.

Target Customers: The study reveals that the majority of garden egg marketers (72.0%) sell directly to consumers. This underscores the retail-centric nature of the enterprise, with a smaller proportion selling to wholesalers (18.0%) and other retailers (10.0%).

Quantity of Garden Eggs Bought: The majority of marketers (54.0%) buy garden eggs in quantities above 10 bags, indicating a relatively high volume of transactions within the market. Another 34.0% buys 6 – 10 bags, and the last 12.0% buys 1 – 5 bags

Frequency of Purchase: The study shows that the majority of marketers make purchases on a weekly basis (69.0%), with a smaller proportion engaging in daily (12.0%) or monthly (19.0%) transactions. Frequency of Sales: The frequency of sales indicates that a significant proportion of garden egg marketers (58.0%) engage in daily sales, suggesting a dynamic and potentially high-paced market environment. Another 24.0% and 18.0% adopt a frequency of fortnight sales and weekly sales respectively

Transportation Means: The transportation means employed by marketers vary, with a notable portion (45.0%) using tricycles (keke) and buses (23.0%). This information can be crucial for understanding the logistics and distribution aspects of the market. 21.0% uses wheelbarrow, while the last 6.0% carry by hand.

Table 2: Marketing channels of garden egg marketers

Channels	Frequency	Percentage
Position in the market:		
Producer/Supplier	29	29.0%
Wholesaler	12	12.0%
Retailer	59	59.0%
Who do you sell to?		
Wholesaler	18	18.0%
Retailer	10	10.0%
Consumer	72	72.0%
Quantity of garden eggs bought in bags		
1 - 5 bags	12	12.0%
6 - 10 bags	34	34.0%
Above 10	54	54.0%
Frequency of purchase:		
Daily	12	12.0%
Weekly	69	69.0%
Monthly	19	19.0%
Frequency of sales:		
Daily	58	58.0%

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Weekly	18	18.0%
Fortnightly/every two weeks	24	24.0%
Transportation means:		
Carrying by hands or head	6	6.0%
Wheelbarrow	21	21.0%
Keke	45	45.0%
Taxi	5	5.0%
Bus	23	23.0%

Source: Field Survey, 2025

Costs and Returns of Garden Egg Marketing

The cost and returns of garden egg marketing are presented in Table.3.The profitability margin of the marketers revealed a sales revenue of N464, 000. A detailed breakdown of sales revenue allows for a more granular analysis of the financial aspects of garden egg marketing, helping to identify areas where costs are higher or where adjustments could be made.

Again, the marketers incurred a total marketing expense of N307, 000. This total marketing expense is inclusive of the purchase cost of garden eggs, cost of loading and off-loading, market levy, transportation cost, logistics, and the cost of packaging materials. There was a relatively fixed cost of N24, 500 which amounts from asset depreciation and shop rent. These cumulate a total cost of N331, 500. The bulk of the costs comes from Variable Costs, with significant expenses related to the purchase of garden eggs, logistics, and packing materials.

Furthermore, the profit margin, which is calculated as sales revenue minus marketing cost is N132, 500. Again, the profitability index is calculated as profit margin divided by total costs, expressed as a percentage profit margin / total costs) * 100 = (132,500 / 331,500) * 100 ≈ 33.8%

However, the fact that the business generated a Profit Margin of N132, 500, which is 33.8% of the Total Costs, suggests a positive return on investment. Conclusively, the garden egg marketing venture appears to be profitable, with a positive Profit Margin and a relatively healthy Profitability Index.

Table 3: Costs and Returns of Garden Egg Marketing

Items Description	Quantity	Unit price (N)	Amount (N)
Sales Revenue:			
Garden egg (bags)	58	8,000	464,000.00
Variable cost:			-
Purchase Cost	60	3,900	234,000.00
Loading and off-loading			20,000.00
Market levy			3,500.00
Transportation			15,500.00
Logistics			24,000.00
Packing materials	20	500	10,000.00
VC:			307,000.00

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Fixed cost	
Asset depreciation	18,500.00
Shop rent	6,000.00
Total FC	24,500.00
Total cost	331,500.00
Profit margin	157,000.00
Profitability index	33.8%

Source: Field Survey, 2025

5. CONCLUSION

This study investigated the Market Analysis of garden egg (*Solanum melongna*) in Aniocha South Local Government Area of Delta State, Nigeria.

This study revealed some interesting findings about the marketing of garden egg in the study area. The marketing channels analysis indicated that (59.0%) of marketers are retailers, emphasizing a retail-centric structure. Most marketers (72.0%) sell directly to consumers, and a majority (54.0%) purchase garden eggs in quantities above 10 bags. The study on costs and returns reveals a profitable venture, with a positive profit margin of N132, 500 and a profitability index of 33.8%.

6. RECOMMENDATIONS

1. The marketing board or the cooperative societies should place stability in the prices of garden egg
2. Storage facilities should be made available by the government; traders should be trained on the best way to store their garden egg till they are fully sold out.

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