

Profitability Analysis and Efficiency of Ginger Marketing in Benue State, Nigeria

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Abstract: The study examined the profitability and efficiency of Ginger Marketing in Benue State Nigeria. Multistage sampling technique was used in selecting 256 respondents. Data were obtained from primary source with well-structured questionnaire and analyzed using descriptive statistic, gross margin and marketing efficiency analysis. Results from the socio-economic characteristics showed that 35.2% were male and 64.8% were female with mean active workforce of 46.82 years; majority of ginger marketers (77.3%) were married and the mean household size was 9; ginger marketers had a mean marketing experience of 10 years and the mean formal education attained by ginger marketers was 7 years indicating that most ginger marketers had education. The gross margin was N98.36 and N151.78 for wholesalers and retailers respectively. The result further showed that marketing efficiency was 46.58% for retailers and 7.96% for wholesaler in the study area. Ginger marketers are faced with the problem of heavy tax and high cost of transportation. The study showed that ginger marketing is profitable and efficient in the study area. It is recommended that tax should be properly conducted to reduce multiple taxation and good roads should be provided to reduce transport cost.

I. Introduction

Ginger (*Zingiberofficinale* Roscoe) belongs to the family Zingiberaceae and is an important commercial crop grown for its aromatic rhizomes. It is one of the oldest and renowned commercial spices esteemed for its aroma, flavour and pungency. Ginger is a herbaceous spice grown extensively around the World for its pungent aromatic rhizome (Erinle, 1988, Nmedu and Marcus, 2012; Abah 2019). It is an important commodity in world trade (Ajibade and Dauda, 2005) and is used in Asia and around the World as a spice and for medicinal purposes (Asumagba *et al.*, 2006, Jakes, 2007, Egbachina and Enujeke, 2013; Abah 2019), its acceptance and use are on the rise in Nigeria due to heightened health consciousness.

Northern Nigeria is the largest user of ginger in the country (Abah *et al.*, 2008; Gege, 2021). In Nigeria, ginger is mainly cultivated in Kaduna State (Obinatu, 2003; Nmadu and Marcus, 2012; Makarau *et al.*, 2013; Ayodele and Sambo, 2014). Yields of 35 to 50 tons/hectare can be obtained under good agronomic practices (Asumugha *et al.*, 2006; Jakes, 2007; Gege, 2021). Out of the estimated world annual ginger production in the 1980s of 50,000 tonnes (dry weight) of ginger, Nigeria accounted for 15,000 tonnes. In 2000, the World production was estimated at 717,461 tonnes from a land area of 296,650 hectares mainly from Nigeria, India, China, Indonesia, Bangladesh, Thailand, The Philippines and Jamaica. In terms of area under ginger cultivation, Nigeria ranks first with 56.23% of total world area under cultivation. This is followed by India (23.6%), China (4.47%), Indonesia (3.37%) and Bangladesh (2.32%) (Asumugha *et al.*, 2006; Gege, 2021).

In Nigeria, Benue State produces about 500 tonnes of fresh black ginger annually (Gbenga, *et al.* 2019). It is expected that the figure has increased in recent times.

The economic value of ginger (*Zingiberofficinale* Roscoe) centres around its uses in the preparation of medicines, foods and in the manufacturing of beverages, pharmaceuticals and perfumes. In foods, ginger is used to flavor bread, cakes, biscuits, usages and cookies. It is also blended with other spices for household uses. Ginger ale, ginger beer, and ginger tea are among the beverages produced with it (Rodriguez, 1971, Egbuchua and Enujeke, 2013, Olubumiet *et al.* 2013). It is also used to some extent in perfume products (Currement 2021).

With the emphasis currently being placed on local sourcing of raw materials in Nigeria, it is envisaged that in the very near future, ginger will be industrially utilized on a larger scale for the manufacture of an assortment of perfumes, confectionery, alcoholic drinks and pharmaceuticals.

The ginger crop, in spice sub-sector, has an immense potential for economic development and poverty reduction through creation and expansion of employment opportunities and distribution of income and foreign exchange earnings. Despite all the potentials

and opportunities of having such a long history with a diversified conducive agro-ecology base, this spice sub-sector is still not organized.

Ginger being an agricultural product is bulky and perishable. It therefore exerts various pressures on handling, packaging, transport and sales with adverse antecedent effect on market prices. In addition, poor storage facilities coupled with improper handling and transportation stress lower quantity and quality and cause losses leading to reduced market margins and poor returns (Ugwumba, 2009; Saleh *et al.*, 2016).

Agricultural marketing is concerned with all stages of operations which includes movement of commodities (e.g ginger) from the farms to the consumers. It involves the performance of all activities involved in the flow of goods and services from the point of initial production until they are in the hands of ultimate consumers (Adesiyani *et al.*, 2007). Marketing is the sum total of all business activities involved in the movement of commodities from production to consumption. This definition is applicable to the marketing of industrial goods as well as that of agricultural commodities (Katherine *et al.*, 2010).

The main aim of marketing is to achieve efficiency, but most of Nigerian agricultural markets are inefficient due to high market margin, abnormal profits, infrastructural facilities, high marketing cost and poor pricing performance (Bila and Bulama, 2007; Solumbe *et al.*, 2015). The inadequacy of marketing facilities and socio-economic infrastructure in most developing countries might also have effect on both consumers and sellers of gingers and other commodities. In the midst of the various problems bedeviling agricultural marketing in developing economies research attention will continue to interrogate the levels of efficiency from different dimension in order to suggest strategies for improvement. The objective of the study is to analyze the marketing efficiency and profitability of ginger in Benue state. Specifically, the study aimed to describe the socioeconomic characteristics of ginger marketers in study area, determine the cost and returns associated with marketing of ginger, examine the marketing efficiency of ginger, and identify the constraints to ginger marketing in the study area.

II. Methodology

The Study Area

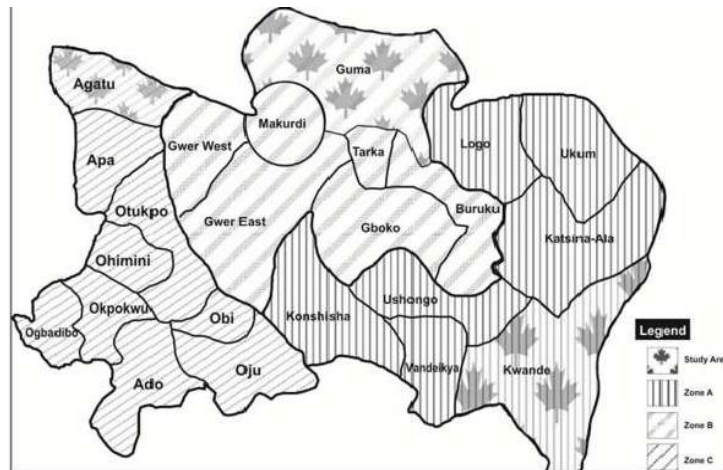
The area of this study is Benue State of Nigeria. Benue state was created in 1976 and is located in the middle belt region of Nigeria with the capital at Makurdi. Benue state lie approximately between latitudes 6030'N and 8010'N of the equator and longitudes 6035'E and 8010'E of the Greenwich meridian, [Benue State Agricultural and Rural Development Authority, (BNARDA), 2005]. Benue state is considered as one of the hottest States in Nigeria with an average minimum and maximum temperature of 210C and 380C respectively. It is in the southern guinea savannah ecological zone, which has a typical climate with the clearly marked seasons of dry season (late October to March) and wet season (April to early October).

The main annual rainfall in the state is 15000mm. The important feature of the state is the river in which the state derived its name from. The state share boundaries with five States, Nassarawa to the North, Taraba to the East, Cross -River to the Southeast, Enugu to the Southwest and Kogi to the west. The southern part of the state is also bounded with republic of Cameroun. Benue State has a land mass of about 33,955km with 23 local government areas. Geographically and agriculturally, Benue State is divided into three zones, Zone A (Katsina-Ala, Ukum, Ushongo, Vandeikya, Logo, Kwande and Konshisha local government areas) Zone B (Gboko, Tarka, Buruku, Gwer East, Gwer West, Guma and Makurdi Local government areas), Zone C (Ado, Agatu, Apa, Otukpo, Ohimini, Okpokwu, Ogbadibo, Obi and Oju local government areas). The state has a total population of 5,741,800 people (National Population Commissions 2006).

About 80% of the state population is directly involved in agriculture. The state is also called the food basket of nation, because the state produces agricultural commodities in large quantities.

These crops among others are cultivated in great quantity. They include cash crops like; Palm produce, Cashew, Groundnut, Coffee, Cotton etc. Ginger, being a multi-facet economic crop and having both domestic and international value, its cultivation and marketing is becoming popular within the study area, as its production and marketing cuts across gender groups.

Figure 1: Map of Benue State showing the study areas.



Source: Modified from [https://www.onlinenigeria.com\(2003\)](https://www.onlinenigeria.com(2003))

Population and Sampling Method

The population of the study comprised 850 ginger traders in Benue State (Association of Ginger farmers Benue State 2022). The interest was on wholesalers and retailers who purchase ginger in large quantities of 500kg and above for resale to both processing establishments and final consumers in major towns and local government.

Purposive, multistage and stratified sampling technique were adopted for the study. In stage one; the study area was divided into three agricultural zones which are; zone A, zone B and zone C. In stage two, two local government areas (LGAs) were purposively selected from each of the three agricultural zones, namely, Vandeikya and Kkonshisha from zone A, Buruku and Makurdi from zone B and Otukpo and Oju from zone C. In third stage, twelve major markets were randomly selected from these local governments based on a prior information that they are leading ginger markets in terms of existence of many buyers and sellers and also volume of ginger. These markets are Tsar, Ihugh and Agbo markets in Vandeikya Local Government Area, Tse-Agberagba, Korinya and Jor markets in Konshisha Local Government Area, Wurukum, Wadata and Railway markets from Makurdi Local Government Area, Tyowanye, Abwa and Ajoho markets in Buruku Local Government Area, Ihigile, Ihi-ejo and Ihi-Obile markets from Oju LGA and Ela, Olihi-Ogli and Ogoli markets from Otukpo LGA. In the last stage, the marketers were stratified into wholesalers and retailers and proportionately selected according to the population of each market. From the sample frame of 850 registered ginger marketers, a sample of 256 marketers were randomly selected to constitute the study respondents.

Method of Data Collection and Analysis

Primary data were collected using a structured questionnaire on the socio-economic characteristics of ginger sellers, marketing efficiency, costs and returns and constraint associated with ginger marketing in the study area. Prior to the administration of the questionnaires, the questionnaires were pre-tested and necessary corrections were made. Content validity was used to determine the adequacy of the research instrument. In the process, the instrument was thoroughly and independently examined by appropriate experts. The experts gave their critical opinion on the adequacy and relevance of the instrument to the objectives of the study. The observation was harmonised and necessary corrections were made on the instrument before the start of the survey. The test-retest method was used to determine the reliability of the research instrument. Twenty copies of the research instrument were administered twice to the respondents at given intervals. The two results were correlated and a correlation coefficient of 0.920 was obtained indicating high reliability. The data collected for this study were analyzed using both descriptive, gross margin and marketing efficiency analysis. The elements of descriptive statistics such as average, frequency and percentages were adopted to analyze the socio-economic characteristics of ginger sellers in Benue State, while gross margin model and marketing efficiency analysis was used to determine the profitability and marketing efficiency of ginger marketers.

Model specification

Descriptive statistics

Descriptive statistics involving the use of measure of central tendency such as frequency and percentages was used to describe the socioeconomic characteristics of ginger marketers and problems associated with ginger marketing in the study area.

Gross Margin

The Gross Margin model is specified from the point of view of estimation of total expenses (costs) as well as various returns or revenue within a ginger marketing period. In line with Ekerete & Asa, (2014) gross margin model is specified as follows:

$$\text{Gross Margin (GM)} = \text{TR} - \text{TVC}$$

Where,

TR = Total Revenue

TVC = Total variable cost (loading and offloading cost, rent on store, local government fee, market levy, sacks, transport cost, security, e.t.c)

$$\text{Total revenue (TR)} = Q \cdot P_y$$

Where,

Q = Quantities of ginger sold (100Kg);

P_y = Unit price of ginger (₦/100kg)

Fixed costs were not included because they were negligible.

Marketing Efficiency Analysis

Marketing efficiency analysis was employed to estimate the marketing efficiency for the wholesalers and retailers of ginger in the study area.

$$\text{Marketing efficiency} = \frac{\text{selling price} - \text{cost price}}{\text{marketing costs}} \times \frac{100}{1}$$

Where

Selling price = the return from the sale of ginger.

Cost price = purchase price

Marketing costs = all expenses made to market ginger.

III. Results and Discussion

Socio-economic Characteristics of Ginger Marketers

The socio-economic characteristics of ginger marketers studied in this research work in Benue State included sex, age, marital status, household size, marketing experience, formal education and membership of market association. The distribution of respondents by each of the socio-economic characteristics in this study is shown below.

From the study, the distribution by sex showed that of the 256 farmers interviewed, 90 are male and 166 are female. The percentage distribution by sex is 35.2% for male and 64.8% for female. This revealed that women play a greater role in the retailing of ginger in the study area. This is in agreement with Akinpelu *et al.* (2011) that spice marketing is dominated by female. Thus, women are more active in the marketing of ginger than men in the study area.

The result of the analysis showed that, the average age of respondents was 46.82 years. This implies that ginger marketers are in the productive age which could lead to increase in their efficiency. Specifically, 36-47 years had the highest frequency of 93 with percentage distribution of 36.3% followed closely by the age range of 48-59 years which had a frequency of 90, with percentage of 35.2. Next is the age range of 24-35 years whose frequency was 56 and has percentage of 21.9% and lastly, the age range of 60-71 years with the percentage of 6.6%. This indicated that the active work force in ginger marketing in the study area fell within the ages of 36-47. Young people of ages 24-35 years did not find ginger marketing very attractive as the age range ranked third in the frequency distribution. People within the ages of 48-59 years also find ginger marketing business an attractive one. This is shown in the table as the age range ranks second highest.

From the table also, 77.3 % of the respondents were married from the result of this study while 22.7% were single. This meant that, people who are married engage more in ginger marketing. It also implied that the income from the sale of ginger is also used for the upkeep of the family. This agreed with Akinpelu *et al.* (2011) that married people tend to have more financial commitment and home up keep than singles therefore need to have a source of income such as marketing spice to Cater for these responsibilities. This also confirms the research work of Ishaya (2014) who reported that it could also be attributed to the fact that marriage comes

with more responsibilities as a result of large family size, and hence, the need for household head to engage in multiple livelihoods that could provide sufficient income for the family up keep.

The average distribution of household size was 9. This implies that there was availability of family labour and this could lead to reduction in the cost of marketing. Specifically, the household size of range 6-9 (54.7%) had the highest frequency followed by the range of 2-5 with the percentage of 34.8%, next, the range of 10-13 household size with the percentage of 7.8% and lastly the household size of 14-17 which is represented by 2.7%. This result signified that household with lower population engage more in ginger marketing. This could be attributed to the fact that household with higher population engaged in marketing more spices in addition to ginger.

Ginger marketers have marketing experiences ranging as follows 2-10 years or months? with the highest percentage of respondents 66.8%. The range of marketing experience 11-19 years had 21.1% marketing experience with the range of 20-28 years having 9.0 % and ginger marketers with marketing experience of range 29-37 years had 3.1%. This result implied that majority of ginger marketers are new in the business.

The average distribution of educational attainment of respondents in this study was 7.0. 16.40% has no formal education whereas 14.5%, 46.80%, 22.88% had primary, secondary and tertiary education. This shows that majority of the respondents were literate enough to acquire additional knowledge to sustain their marketing activities. This is in agreement with Ishaya (2014) that most of the respondents are literate enough to give room for effective communication in undergoing their marketing business in the study area. This is acceptable on the ground that educational level plays a good role in adoption of new policy and undertaking risks (Nkang *et al*, 2009), as cited by Ishaya, (2014).

Results from the study shows that majority of ginger marketers 79.7% did not belong to any ginger market association and 20.3% were members of market association. This is because most of the marketers are new in the business.

Table I: Socio –economic characteristics of respondents

Characteristics	Frequency	Percentage	Mean
Sex			
Male	90	35.2	
Female	166	64.8	
Age (years)	56	21.9	46.82
24-35			
36-47	93	36.3	
48-59	90	35.2	
60-71	17	6.6	
Marital Status			
Single	58	22.7	
Married	198	77.3	
Household Size	89	34.8	9.12
2-5			
6-9	140	54.7	
10-13	20	7.8	
14-17	7	2.7	
Ginger Marketing Experience			10.31
2-10	171	66.8	

11-19	54	21.1	
20-28	23	9.0	
29-37	8	3.1	
Formal Education			7.0
No formal Education	42	16.40	
Primary Education	37	14.45	
Secondary Education	120	46.87	
Tertiary Education	57	22.88	
Marketing Association			
Yes	52	20.3	
No	204	79.7	
Source: field survey, 2022			

Costs and Returns associated with Ginger Marketing

Table 2 showed the result of cost and returns of ginger marketing as a measure of profitability in the study area. For the wholesalers, the average total returns obtained from the sale of 1kg of ginger was ₦105.12 and the average purchase price for 1Kg was ₦91.2. The average total variable cost for 1kg of ginger was ₦6.761 and the total cost of 1Kg of ginger was ₦97.97. The gross margin obtained from the sale of 1kg of ginger by the wholesaler was ₦98.36.

From the table, the retailers had average total revenue of ₦160 per Kg of ginger sold. The average total purchase price of 1kg of ginger was ₦101.98. The average total variable cost for 1Kg of ginger was ₦8.22 and the average total cost of 1Kg of ginger was ₦110.20. The gross margin obtained by the retailers per Kg of ginger was ₦151.78. The positive values of gross margin obtained shows that the ginger marketing actors were able to cover operating expenses with a significant level of profit obtained from the study area.

The result is in line with that of Aina *et al.* (2012) whose result of gross margin analysis revealed that total revenue (TR), total variable cost (TVC) and gross margin (GM) were ₦6,962.4, ₦4,254.5 and ₦2,707.9 respectively was profitable for plantain marketing in Ondo state.

Table 2: Costs and Returns of Ginger Marketers

Variables	Wholesalers	Retailers
Average Revenue from sale (N/Kg)	105.12	160.00
Average Purchase price (N/Kg)	91.20	101.98
Average Total variable cost(N/Kg)	6.761	8.220
Average total cost (N/Kg)	97.97	110.2
Gross margin (N/Kg)	98.36	151.78
Source: field survey, 2022		

Marketing Efficiency of Ginger Marketers

The marketing efficiency analysis was used to determine the marketing efficiency of ginger marketers. The marketing efficiency of 46.58% was obtained from the result of retailers and that of the wholesaler was 7.96% from the study. Values of result shown on table 3 are greater than 1, indicating that ginger marketing in the study area is efficient.

The marketing efficiency of the retailers is higher than that of the wholesalers. This may be attributed to retailers adding value to the products by way of packaging in smaller quantities. This is reflected in the higher profitability level as analyzed under costs and returns. This finding agrees with Sulumbe *et al.* (2015) who associated nature of cost incurred in performing the marketing functions as the reason for differences in marketing efficiencies of onion farmers in Borno State.

This result on table 3 further showed that the coefficient of variation (CV) of marketing efficiency of retailers and wholesalers were 0.43 and 0.99 respectively. The coefficient of variation is often compared between two groups to understand which group has lower standard deviation relative to its mean (in this case, the retailers and the wholesalers). In most fields, lower values for coefficient of variation are considered better because it means there is less variability around the mean. In this scenario, the retailers had a lower coefficient of variation from the mean. It is better to invest there as a greater chance of recovery of investment is more guaranteed.

Table 3: Marketing Efficiency of Ginger Marketers

Variable	N	Mean	Standard Deviation	Minimum	Maximum	CV
Retailer	174	46.58	19.98506	43.59013	49.57019	0.43
Wholesaler	82	7.96	7.937843	6.21718	9.704989	0.99

Source: field survey, 2022

Constraints to Ginger Marketing

Table 4 shows that heavy produce tax/levy ranked the highest with frequency of 96 followed by high transportation cost. Ginger marketers also lacked credit facilities. Most ginger marketers obtain their source of finance from personal savings which was one of the reasons they could not expand their business. Inadequate Infrastructures, storage facilities and security were also a noticeable problem. These constraints have affected the performance of ginger marketing in the study area. This study disagrees with Obayelu, *et al.* (2014) whose findings showed that greater percentage (29%) of the marketers were faced with the problem of inadequate storage facilities which often lead to produce loss due to spoilage as a result of fungal and bacteria attack, insects and rodents' infestation. These result into increase in marketing costs leading to higher retail prices and reduced marketing efficiency.

Table 4: Constraints to Ginger Marketing

Variables	Frequency	Percentage	Rank
Heavy produce tax/levy	96	37.5	1
High transportation	84	32.8	2
Lack of credit facilities	75	29	3
Inadequate infrastructures	70	27.3	4
Poor storage facilities	60	23.4	5
Robbery	52	20.3	6

Source, field survey, 2022

IV. Conclusion

The study analyzed the efficiency and profitability of ginger marketing in Benue State, Nigeria. The findings show that ginger marketers were new in business and did not belong to any ginger marketing association.

Ginger marketing is profitable and efficient in the study area. The main problem faced by the marketers was multiple produce tax and high transportation cost.

V. Recommendations

Based on the findings, the following recommendations were made;

1. Efforts should be made to eliminate the constraints to the ginger marketing in the study area by improving on the socio-economic facilities such as roads, markets and related amenities. The Benue State Government can do its own part by

renovating existing bad roads and constructing new ones especially those that link the points of supply to point of consumption.

2. marketers should be encouraged to form cooperative societies to promote bulk purchase and transportation of ginger in the area. This will reduce the high cost of transportation involved in the marketing of these commodities as well as enable them achieve the benefits from the economy of scale.

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