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PROFITABILITY ANALYSIS OF BAMBARA GROUND NUT MARKETING IN ENUGU METROPOLIS, ENUGU STATE, NIGERIA

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ABSTRACT

This study explored the profitability of raw Bambara groundnut marketing in Enugu Metropolis, Enugu State, Nigeria. Multi-stage survey design was used to sample 60 respondents by means of well structured questionnaire. Descriptive and inferential statistics were used to realise the objectives. Majority of the respondents (78.3%) were males; the modal age was 43-53; mean years spent in school was 16.07 years. Only (28.3%) had access to credit, while (71.7%) financed their businesses through personal savings. Quantity of bambara groundnut sold was significantly and positively influenced by: household size ($p < 0.05$); access to credit ($p < 0.01$); and access to market information ($p < 0.01$). The following results were also observed: GPM 16.5%, NPM 14.7%, BCR 1.17:1, and ROI 17.3%. Major constraints include: inadequate finance with mean score of (3.93), seasonal price fluctuations (3.93), poor road network (3.70), weevil attacks (3.23) and high cost of goods (3.28). The study recommends that the relevant government agencies should formulate policies that will enable the marketers to have access to cheap credit facilities for expansions and even for new entrants, in order to reduce unemployment and poverty levels in the area. Good road networks and commodity storage systems should be provided by the agencies to ensure easy movement of goods, as well as curtail post-harvest losses. Also, the marketers should form/join cooperative societies, and other market associations for easy access to finance and other resources.

Keywords: Analysis, Bambara Groundnut, Marketing, Enugu Metropolis .

1. INTRODUCTION

The success of every agricultural production, especially, for commercial purposes lies in the marketability of the goods and services produced. According to Arene (2003), marketing is one of the vital aspects of agriculture since agriculture entails the production of goods and services, and production is said not to be complete until the product reaches the final consumer. Agricultural produce marketing, bambara ground nut inclusive, is very crucial in crop production, consumption, unemployment and poverty reduction, food security and economic growth. Traditionally, bambara ground nut is used as a complete diet, providing food security and source of income for the farmers (Olayide et al. 2018). According to Hassan (2022), agricultural marketing is not just important for increasing productivity and consumption, but also for accelerating economic growth, and as a result, it is the most powerful multiplier of agricultural development. Therefore, agricultural marketing exerts very important influence on food availability, accessibility, and farmers' welfare.

Marketing concept, according to Kotler and Keller (2006), is a philosophy which sees the customer or client as the central focus of all the activities of an organization, as no organization

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will survive without the continued patronage of its customers. Agricultural marketing is the performance of all business activities involved in the flow of food products and services from the point of agricultural production until they are in the hands of consumers (Kohl and Uhl, 1985). According to Arene (2003), agricultural marketing involves all those legal, physical and economic services that make it possible for products from producers to get to consumers in a form desired by consumers, and at a price agreeable to both the producers and consumers for effecting a change of ownership to possession. As simply put forward by Hassan (2022), the term marketing refers to a set of activities involved in getting products from point of production to point of consumption.

Although bambara ground nut is not produced in large quantities in Enugu State, but in the northern part of Nigeria, it is one of the most important legumes chiefly consumed within the state. Therefore, even distribution of this commodity from the North down to the East through marketing, is of paramount importance. Ladele and Ayola, (1997) in Ani et al. (2017) asserts that households' food security is a function of food production level, food marketing efficiency and the house holds' income level. According to Food and Agricultural Organization (FAO, 1997), if available food could be evenly distributed through efficient national and international markets, each person would be assured of 2,700 calories per day, which is the recommended daily calorie ingestion. An efficient food marketing system would reduce post harvest-losses, ensure adequate returns to farmers' investments and stimulate expansion in food production, thereby enhancing the level of food security in Nigeria (Ladele and Ayoola, 1997). According to Hillocks et al., (2012), accessible market outlets might provide the incentives for smallholder households to obtain improved seeds and invest more of their land and labour in the bambara ground nut.

Failure to effectively and efficiently allocate products and services can cause an overthrow of the system by those who are deprived (Spacey, 2018). Olayide et al. (2018) observes that commercialization of bambara ground nut leads to increased welfare of its farmers. To achieve zero hunger by 2030 and to end malnutrition in all its forms, the target is to increase the availability and accessibility to nutrients not just calories (Tan et al. 2020). According to the authors, marketing information is one of the major factors that affect marketing decisions. Access to credit is another important factor to the success of agricultural produce marketing, including bambara nut. Microcredit impacts positively on output, and income; and reduces vulnerability (Evbuomwan, Okoye, 2017; Ayinde et al., 2018). Mure et al., (2014) observes that age, household size, and experience are some of the factors that influence bambara nut value chain. Nnadozie et al. (2015) asserts that based on group synergy and dynamics, advertising cost is reduced. Therefore, being a member of cooperatives and/or related market associations boosts the capacity and capability of an entrepreneur with respect to better market bargaining and access to resources.

Bambara ground nut (*Vigna subterranean (L) Verdc)* is one of the most important leguminous crops consumed in Enugu State, and Enugu Metropolis in particular. According to Hillocks et al. (2012), it is an indigenous African crop which is mainly grown by the people as a subsistence food crop and for income generation. It serves as an important source of protein in the diets of a large percentage of the population, particularly to the poor people who cannot afford expensive animal protein, and shares high nutritive values as other widely consumed legumes (Hillocks et al. 2012). Bambara nut makes a balanced diet as it contains sufficient quantities of carbohydrate (65%), protein (16.25%) and fats (6.3%) with relatively high proportion of lysine and methionine (Tan, et al. 2020). The authors further assert that, this food

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crop has numerous and impressive nutritional and agro-ecological profile, with the potentials to improve the global food system. According to Ibrahim et al. (2018) and Tan et al. (2020), it is a minor crop and an underutilized African legume, which has the potential to contribute to food and nutrition security at household, national and global levels, while providing solutions to environmental sustainability and equity in food availability and affordability.

However, bambara groundnut's potentials are, according to Ibrahim et al. (2018) and Tan et al. (2020), undermined by several factors, including resource limitation, knowledge gap, social stigma, and lack of policy incentives. Hailu et al., (2016) observes that market information and linkage, road access, agro-processing and commercialization, ware housing, financial sectors' development, legislation and transaction costs on marketing were some of the major challenges of agricultural marketing in Konta Special District, Southern Ethiopia.

Problem Statement

The high nutritional values and the advantages of bambara ground nut have not been adequately harnessed. Intake of plant-based foods such as bambara ground nut helps to avert poor diet-related diseases. However, many researchers argue that despite the impressive nutritional and ecological profile of this leguminous crop in improving the global food system, it is neglected and underutilised. Bambara ground nut is one of the neglected and underutilized crops (Mubaiwa et al. 2018; Mayes et al. 2019; Onuche et al. 2020 & Abberton et al. 2022).

Many researchers have studied various related topics on bambara groundnut within space and time, with many focusing on its production, processing, and very few dwelling on its marketing. Works by Berchie, Adu-Dapaah, Dankyi & Plahar, 2010; Hillocks, Bennett & Mponda, 2012; Mure, Olumuyiwa & Elijah 2014; Ibrahim, Dansi, & Alou, 2018; Olayide et al, 2018 & Tan et al., 2020, and Onuche et al. 2020 are some of them. However, from the researchers' knowledge, adequate research has not been done on marketing and efficient distribution of this leguminous food. There is little documented evidence of trade in bambara nut, (Hillocks et al., 2012). Boulay and Khan (2020) also argue that indigenous crops such as bambara groundnut are neglected in development research. This work critically analyses the economics of bambara ground nut marketing in Enugu Metropolis of Enugu State, Nigeria so as to shade more lights on the enterprise's profitability and other economic values of the food crop. This research also, bridges the existing knowledge gap, as the topic has not been explored in the study area.

Objectives of the Study

Broadly, this study analyses the economics of bambara groundnut marketing in Enugu Metropolis, Enugu State, Nigeria. The specific objectives were to: (i) measure the profitability of marketing bambara ground nut in the area; (ii) determine the factors which influence quantity of the commodity marketed; and (iii) identify the constraints which militate against the enterprise.

2. MATERIALS AND METHODS

Study Area

The study was carried out in Enugu Metropolis of Enugu State, Nigeria. The area is domiciled in South-Eastern Nigeria. It comprises of the capital and the administrative areas of the state. The area is located between Longitudes 6˚27' and 9˚60'N; and Latitudes 7˚26', 7˚30'E of the Greenwich Meridian (Geo-information, 2014). It has a population size of 722,664 and density of about 6,400 per square kilometre (NPC, 2006).The inhabitants are very resourceful, and are mostly engaged in trading and civil service, with many involved in agricultural produce

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marketing. Bambara ground nut is not produced in Enugu State, but is usually marketed from the Northern part of the country where the commodity is largely cultivated. However, it is processed and consumed in large quantity in the State. Two seasons: the dry season (November to March) and the rainy season (April to October), are prevalent in the study area. The dry season gives better weather for bambara nut marketing in the area.

Sampling Techniques

Multi-stage survey design was adopted for the study. Well-structured and pre-tested questionnaire, designed to capture relevant data on specific objectives was used for data collection. Four big markets in the study area (Orie Emene, Abakpa, Ogbete, and New market) were purposively selected for the study. These markets were chosen because they are the sites where bambara ground nut is dominantly sold in large quantities. Because these four markets are situated within the metropolis, and have almost the same number of bambara nut marketers, fifteen (15) marketers of the commodity were randomly sampled from each of the markets, giving a total of sixty (60) respondents.

Analytical Techniques

Ordinary Least Square Multiple Regressions

The OLS multiple regression analysis was used to determine the socio-economic characteristics of respondents which affect the quantity of bambara groundnut marketed in the study area. The model is stated implicitly as:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7)$ ei

Where: Y = Quantity of bambara groundnut marketed (kg);

X_1 = Age (years);

X_2 = Gender (dummy: female=1; male=0);

X_3 = Marital status (married = 1; not married = 0);

X_4 = Education level ((years); primary=1, secondary=2, degree=3)

X_5 = Secondary occupation (dummy: farming= 1, others = 0);

X_6 = Household size (number); and

X_7 = Access to credit (dummy: had access = 1, no Access = 0)

X_8 = Belong to Cooperative (dummy: yes = 1, no = 0)

ei = Stochastic error term.

Gross Profit Margin (GPM)

Gross Profit Margin (GPM) = TR – (COGS/TR)*100/1

Where: TR = Total Revenue; COGS = Cost of Goods Sold.

Net Profit Margin (NPM)

Net Profit Margin (NPM) = ((TR – TC)/TR))*100/1

TR = Total Revenue; TC = Total Cost.

Return on Investment (ROI):

(ROI) = ((TR – TC)/TC)*100/1

Likert Scale Rating

A four- point Likert Type Scale Rating was employed to realize objective vi. The corresponding points are as follows, Very serious (4); Serious (3); Moderate (2); and not serious (1). The real limit point is (4+3+2+1)/4. This gives a real limit value of 2.5. The upper limit was (2.5 + 0.05) =

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2.55, while the lower limit was (2.5 – 0.05) = 2.45. Any constraint with a mean score of (MS ≤ 2.45) did not seriously affect the quantity of bambara nuts marketed; constraint with the mean score of (2.45 ≤ MS ≤ 2.5) was moderately serious on the quantity marketed, while any mean score of (2.5 ≤ MS ≥ 2.55) means that the constraint is very serious.

3. RESULTS AND DISCUSSION

Socio-economic characteristics of Bambara Groundnut Marketers

From table 1, males (78.3%) constituted majority of the respondents. Age distribution shows that 36.7% of the respondents were within the 43-51 age categories, followed by the 25-33 (26.7%) age categories. This result is in tandem with the findings of Umezurike (2015) who found the same result and submitted that this may be due to the energy requirement involved in the marketing of raw bambara groundnut. From the result, 41.7% of the respondents were married, while 38.3% were single. Access to market information was 98.3%. This implies that majority of the marketers were informed about the market dynamics which could help them to predict the market trends and to take some robust proactive measures. The respondents had average household size of 5 members. The implication is that the marketers have moderate households size, which might not put financial pressures on their enterprises. Mean years of schooling was 16 years which suggests that the marketers acquired quality education. This could positively influence the marketers' choice of business decisions; enhance efficiency, and returns on investments. Olayide et al. (2018) corroborates this finding. Only 17 respondents (28.3%) had access to credit, while 43 (71.7%) financed their businesses from personal savings. Market information was accessed by 98.3% of the respondents.

Table 1a: Distribution of Respondents According to Socio-economic Characteristics (n=60)

Item	N	Minimum	Maximum	Mean
House hold size	60	1	10	5
Number of years spent in school	60	6	26	16.07
Proximity to produce market	54	25	1092	482.16
Market experience	60	3	30	12.70

Source: Authors' Computation from *Field survey, 2021*

Table 1b: Distribution of Respondents' Socio-economic Characteristics (n=60)

Gender	Frequency	Percent (%)
Male	47	78.3
Female	13	21.7
Age:		
15 – 24	6	10.0
25 – 33	16	26.7
34 – 42	10	16.7
43 – 51	22	36.7
52 – 61	6	10.0
Marital status:		
Married	25	41.7
Single	23	38.3
Others (widows and widowers)	12	20.0
Access to market information		

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Have access	59	98.3
Access to credit		
Have access	17	28.3
No access	43	71.7
Source of capital		
Bank	2	3.3
Relative	8	13.3
Co-operative society	7	11.7
Personal savings	43	71.7

Source: Authors' Computation from *Field survey, 2021*

Determinants of Quantity of Bambara Ground Nut Marketed in the Study Area

Education

Education has positive and statistically significant ($p < 0.05$) relationship with the quantity of bambara ground nut marketed. This implies that a unit increase in the level of education, all things being equal, will increase quantity sold. As level of education increases, it is likely that the tendency for the marketer to learn and cultivate the habit of customer relation and retention would increase. Olayide et al., (2018) observes that education with commercialisation of bambara nut lead to increased farmers' welfare.

Table 2: Socio-economic Factors which Determined Quantity of Bambara Ground Nut Marketed

Variable		Coefficient	T – value	P > |t|
(Constant)		4876.428	1.003	0.323
Age		190.225	1.562	0.228
Education		1524.234	0.773	0.023**
Household size		1645.576	2.130	0.041**
Sex		879.819	0.374	0.711
Marital status		3511.792	1.302	0.202
Access to credit		2638.238	0.646	0.002***
Membership to market association		9494.580	3.772	0.001***
R^2		0.581		
Adjusted R^2		0.566		
F – value	(13.44)	0.0000***		
No of obs.		60		

Source: Authors' computation from field survey, 2021

*** And ** signify 1% and 5% significant levels respectively.

Dependent Variable: Quantity of bambara ground nut marketed.

The F - value of 0.0000*** which is significant at ($P < 0.01$) implies a good fit for the regression madel. Adjusted R^2 of 0.566 shows that 57% change in the dependent variable is caused by the correspondent change in the independent variables.

Household Size

The coefficient of household size has a positive and significant relationship ($p < 0.05$) with the quantity of bambara nut sold. The implication is that an increase in household size, with

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the grown up children assisting in sales, there will be an increase in quantity of bambara nut sold. Mure et al., (2014) agrees with this finding.

Access to Credit

From the result, the coefficient of access to credit is positively and significantly ($p < 0.01$) related to quantity of bamabara ground nut sold. An increase in the amount of credit accessed by the marketers while holding other factors constant would increase the quantity bought and subsequently marketed by the actors. Microcredit impacts positively on output, and income; and reduces vulnerability (Ayinde et al., 2018; Evbuomwan, Okoye, 2017).

Membership to Cooperative Societies

Cooperative membership has positive and significant relationship with quantity of bambara groundnut sold ($p < 0.01$). This implies that belonging to marketing associations significantly improves the marketers' effectiveness. This could be as a result of members' socio-economic networking, acquisition of market information on prices and availability of produce, as well as other resources. Nnadozie et al. (2015) in their study of the Nigerian Agricultural Cooperatives and Rural Development in Ivo L.G.A, Ebonyi State, Nigeria corroborate this result.

Cost and returns on Bambara groundnut marketing

Table 3: Monthly Total Cost and Returns of Bambara Groundnut Marketing

Variable	**Cost in Naira**
Loading cost	75050
Unloading cost	91300
Transportation	327300
Storage	71400
Storage loss	26400
Market fees	64500
Rent	551000
Cost of Goods Sold (COGS)	**56271000**
A: Total Cost (TC)	**57477950**
B: Total Revenue (TR)	**67422500**
Net PROFIT (NP)	**9944550**

Source: Authors' Computation from *Field survey, 2021*

Gross Profit (GP) = TR – COGS = 67422500 – 56271000 = ₦11151500=00

Gross Profit Margin (GPM)

Gross Profit Margin (GPM) = ((TR – COGS)/TR)*100/1

GPM = ((67422500 – 56271000)/67422500)*100/1 = (11151500/67422500)*100/1 = 16.5%.

GPM=16.5%.

From the result, marketing of bambara ground nut in the study area yielded GPM of 16.5% within the period under study.

Net Profit (NP) = TR – TC =₦9,944,550=00. (That is B – A). Therefore, the aggregate net profit made by the marketers during the period under study was ₦9,944,550=00.

Net Profit Margin (NPM)

Net Profit Margin (NPM) = ((TR – TC)/TR))*100/1

NPM = ((67422500 – 57477950)/67422500)*100/1 = (9944550/67422500)*100/1

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NPM = 0.147*100/1 = 14.7%. For every unit of Naira added to the business, there is a marginal profit of 14.7%. This result indicates that bambara ground nut marketing in Enugu Metropolis of Enugu State, Nigeria is a profitable enterprise.

Return on Investment (ROI)

ROI = ((TR – TC)/TC)*100/1 = Net Return on Investment/Cost of Investment*100/1

ROI = (NP/TC)*100/1; ROI = (9944550/57477950)*100/1 = 0.17301*100 = **17.3%.**

The ROI result shows that capital invested in the enterprise by the marketer yielded 17.3% interest during the period understudy. This implies that the business is a moderately viable venture because if the entrepreneur borrowed the invested fund at any interest rate below 10%, he could still record some profit.

Constraints associated with Bambara groundnut marketing in the study area

Table 4: Constraints associated with Bambara groundnut marketing in the Area

Constraints	Mean	Decision
Inadequate finance	3.93	**Very Serious**
Seasonality of produce	3.57	**Very Serious**
High cost goods	3.28	**Very Serious**
Rapid deterioration in quality	2.40	**Not Serious**
Bambara nut weevil attacks	3.23	**Very Serious**
Breakage	2.45	**Not Serious**
Inadequate information	2.55	**Moderately Serious**
Imposition of heavy taxes/levies	3.78	**Very Serious**
Seasonal price fluctuation	3.93	**Very Serious**
Poor road network	3.70	**Very Serious**

Source: Authors' Computation from *Field survey, 2021*

From the table, inadequate finance with mean score (3.93), seasonality of product (3.57), high cost of production (3.28), rapid deterioration in quality (3.20), pest and disease attack (3.23), breakage (2.67), inadequate information (3.73), imposition of heavy taxes/levies (3.78), seasonal price fluctuations (3.93) and poor access roads (3.70) are constraints seriously affecting marketing of bambara groundnut in the study area. Hailu et al., (2016) in their findings corroborate the results of this research with regards to agricultural produce marketing.

4. SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

Though profitable and a viable source of income with moderate returns to investment, certain constraints impede the realization of full potentials of bambara groundnut and its marketing in the study area.

Conclusion

Based on the findings of this study, bambara groundnut marketing in is a viable and promising enterprise, which can serve as an avenue for reduction of poverty and unemployment levels especially in the study area, and generally in Enugu State, Nigeria.

Recommendations

The following recommendations were therefore made by the authors:

1. Pro-agricultural produce marketing policies, adequate and efficient infrastructural facilities such as good road networks and storage systems should be put in place by the

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relevant government agencies so as to ensure availability of funds, easy movement of produce, and as well curtail post-harvest losses.

2. The researchers also, recommend that bambara ground nut marketers in the study area should form or join existing cooperative societies for easy access to credits at cheaper interest rates.

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