

MARKETING EFFICIENCY OF SMALL-SCALE POTATO MARKETERS IN PLATEAU STATE, NIGERIA.

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ABSTRACT

Potato production is a significant contributor to the food industry with a growing demand in domestic and international markets. Plateau state is the leading producer of Irish potatoes in Nigeria accounting for 90 % of the country's production of the crop. Efficient marketing strategies are crucial to increase sales, revenue and profitability for potato farmers and marketers but the problem of high post-harvest losses and inefficiencies may reduce the profitability. This study examines the marketing efficiency of small-scale potato marketers in Plateau State, identifying areas for improvement to increase sales and revenue. Data was collected with the use of structured questionnaire in three purposively selected markets of Jos metropolis using simple random sampling techniques to select the respondents and data were analyzed using descriptive statistics, market margin analysis and market efficiency. Findings from the study reveal that the majority (42.5 %) of the respondents were between the ages of 36-45 years, household size of 4-6 size had the highest members with 45.0%, and < 3 has the lowest members with 7.5 %. The marketing margin analysis indicated that for every 12.5kg potato, gross marketing margin of the marketers is ₦ 394.9 whereas net marketing margin of marketers is ₦ 345.3, return on investment of the marketers is 1.38 however, marketing margin of marketers is 32.00. This means that potato marketing in the study area was profitable. The marketing efficiency for 12.5kg of potato was 796.16 % for retailers. Generally, it can be deduced that the overall marketing efficiency indicates that the markets were efficient. It was concluded that potato marketing was profitable and efficient in the study area despite the constraints faced by the marketers especially the perishable nature of the potato crop which rank first among the problems/constraints to marketers.

Keywords: Marketing Efficiency, Marketing Margin, Potato, Return on Investment, Small-scale.

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INTRODUCTION

Potato (*Solanum tuberosum L.*), is the most commonly cultivated tuber crop and the fourth most important food crop in the world, after wheat, rice and maize (Haan and Rodriguez 2016). Potato is annually cultivated in about 20 million hectares with approximate production of 320 million tons globally (Poczai *et al.*, 2010). The potato production has rapidly overtaken all other food crops in Africa and Asia since the early 1960s and potato production in the world is undergoing major change. Potato is short-duration crop and fits well in different multiple and intercropping systems. Potatoes are grown in wide range of soil (alluvial, hill, black, red and laterite) having a pH range of 5 to 7.5 (Thamburaj and Narendra 2016). Well drained coarse or sandy loam to loamy soils is good for the growth of roots, stolons and tubers as they supply sufficient oxygen. Soils with high organic matter are perfect for potato cultivation. It requires consistent moisture especially when they are producing tubers. Good crop growth

is observed when days are sunny and nights are cool with temperature not more than 23° C. Tuber formation starts from 20 to 25 days after planting. Highest tuber formation takes place when day temperature 20°C and night temperature 14°C (Choudary *et al.*, 2009).

Plateau State is the leading producer of Irish potato in Nigeria accounting for 90 % of the country's production of the crop. Plateau State's production of potatoes for the year 2021 was 2.36 metric tons (FAO, 2023). The state has annual potato production capacity of 960,000 metric tons and it is cultivated in nine of the state's seventeen local government areas. Opportunities abound for potato farmers in Plateau state to partner with French companies across the potato production value chain. The Nigerian Export Promotion Council (NEPC) has tasked potato farmers in Plateau State to produce high quality products to meet global export requirements hence the need for proper management and efficiency in potato production and marketing. Proper management plays an essential role in farming production. Olukosi and Erhabor, (2006) described farm management as both the science and art primarily concerned with the organization of factors of production and operation of farm firms so as to achieve certain predetermined objectives such as profit maximization.

Olukosi *et al.*, (2005) viewed marketing margin as the difference between the price paid by the consumers and that received by the producers. Adegeye and Dittoh (1985) stated that marketing margin is the representation of the difference in price paid to the seller and that paid by the buyer. Giroh *et al.*, (2014) reported that market performance is concerned with technological progressiveness, growth orientation of agricultural firms, efficiency of resource use and product improvement, and maximum market services at the least possible cost. It thus refers to the impact of structure and conduct on prices, costs and volume of output. Marketing efficiency is the degree of market performance. Giroh *et al.*, (2014) defined marketing efficiency as the maximization of ratio of output to input in marketing. The "set of independent organizations involved in the process of making a product or services available for consumption or use" is marketing channel (Coughlan *et al.*, 2006). Arinloye *et al.*, (2012) defined marketing channel as "downstream part of the value chain which consists of numerous chain actors at different outlets, where final products are made available to final consumers. Marketing channel in the context of the agri-food sector indicates the various ways through which food products are made available to the end users (Rhodes, 2007). Channel for one commodity may differ from the other commodity, and these channels are designed such that they deliver a level of value to consumers.

A combination of various factors seems to have triggered the structural increase in potato consumption over the years with consumption broadening across all socio-economic classes, including the poor. Increasing population growth and income level results in rising demand (Global Agricultural Information Network, 2012) coupled with the ease of its preparation and storage. Between 55 and 60% of subsistence farmers' output provides incomes and forms the basis of many households' diets in rural and urban areas (Balami *et al.*, 2011). Potato production in Nigeria faces many constraints, including disease and pest, unavailability of good-quality potato seeds, poor storage methods, insufficient education on farming methods and pest control, inadequate research and development, and inadequate farming equipment. Some of the problems of potato marketing in plateau states include poor roads, high cost of inputs, high cost of fertilizers, poor seedling, insufficient fertilizers among others.

According to numerous studies (Kumar, 2014; Rutttoh *et al.*, 2018), an effective marketing system enhances producers' share in consumer prices, boosts rural incomes and revenue creation for both producers and marketers, and greatly aids in the development of sustainable agriculture. All business

activities associated with the transfer of a product from the producers to the consumers is summed up in Marketing (Kohls and Uhls, 2002). Marketing seeks to match a farmer's products and services to consumers who want access to those products. The matching of product to customer ultimately ensures profitability. Product, price, place, people, and promotion are the Five Ps of marketing. The Five Ps collectively make-up the essential mix a company needs to market a product or service (Alexandra, 2020). Arene (2016) reported that agricultural marketing involves all those physical, legal and economic services, which are necessary to make products from the producers available to the consumers in the form desired by the consumers, at the place desired by the consumer and at the price agreeable to the producers and consumers for effecting a change of possession.

Agricultural marketing is crucial in getting goods from producers to consumers (Rathore and Panda, 2019). Agricultural marketing studies the entire system of economic activities involved in the flow of agricultural products from producers to final consumers, the types of institutions and price-setting mechanisms that guide those flows, the interactions between consumers, agribusiness companies, farmers, and even governments that determine the levels of expenditures, and the distribution of those expenditures as income to market participants (Olukosi *et al.*, 2012). The current economic meltdown, inflation rate and increase in the pump price of petrol in Nigeria, would definitely have its effects on the production, profitability and marketing efficiency of commodities. In addition, high post-harvest losses, long market chain with many intermediaries, inefficient resource use and limited understanding of marketing efficiency in specific region would also have its effects on the production, profitability and marketing efficiency of commodities. In view of these, this study was conducted to evaluate the marketing efficiency of small-scale potato marketers in Plateau-State, Nigeria.

METHODOLOGY

Study Area

Plateau State is the twelfth largest Nigerian state, it is located near the center of Nigeria and includes a range of hills surrounding the Jos Plateau, its capital, and the entire plateau itself. Plateau State is described as "The Home of Peace and Tourism". With natural formations of rocks, hills and waterfalls, it derives its name from the Jos Plateau and has a population of around 4.7 million people. Plateau State is located in the North Central Zone out of the six geopolitical zones of Nigeria. With an area of 26,899 square kilometres (10,386 sq m), the state has an estimated population of about three million people. It is located between latitude 8°24' N and 10°30' N and longitude 8°32' E and 10°38' E. The state is named after the Jos Plateau, a mountainous area in the north of the state with rock formations. Bare rocks are scattered across the grasslands, which cover the plateau. The altitude ranges from around 1,200 metres (3,900 ft.) to a peak of 1,829 metres (6,001 ft) above sea level in the Shere Hills range near Jos. Years of tin and columbite mining have left the area strewn with deep gorges and lakes.

Although situated in the tropical zone, the higher altitude gives the state a near-temperate climate, with an average temperature between 13 and 22 °C. Harmattan winds cause the coldest weather between December and February, with the warmest temperatures usually in the dry season months of March and April. The mean annual rainfall varies between 1,317 mm (52 in) in the southern part to 1,460 mm (57 in) on the plateau, with the highest rainfall during the wet season in July and August. The cooler climate has led to a reduced incidence of some tropical diseases such as malaria. The Jos Plateau is the source of many rivers in northern Nigeria, including the Kaduna, Gongola, Hadeja and Damaturu rivers. The Jos Plateau is thought to be an area of somehow much younger granite which was intruded through an area of older granite rock, making up the surrounding states. These "younger" granites are thought to

be about 160 million years old. This creates the unusual scenery of the Jos Plateau. There are numerous hillocks with gentle slopes emerging from the ground like mushrooms scattered with huge boulders. Also, volcanic activity 50 million years ago created numerous volcanoes and vast basaltic plateaus formed from lava flows. This also produces regions of mainly narrow and deep valleys and pediments (surfaces made smooth by erosion) from the middle of rounded hills with sheer rock faces. The phases of volcanic activities involved in the formation of Plateau State have made it one of the mineral rich states in the country.



Fig 1: Map of Plateau State showing different local government areas

METHOD OF DATA COLLECTION AND ANALYSIS

This study was conducted in some high potato producing Local Government Area of Plateau State to assess the marketing efficiency of potato production. Eighty (80) potato marketers were selected from the study area using simple random sampling techniques. Structured questionnaire was used to collect data from the respondents. This research work was conducted in three selected markets of Jos metropolis. The markets are Bukuru, Barkin-Ladi and Jos main market due to the high concentration of potato marketing and marketers. Thirty-eight questionnaires were administered in Barkin-Ladi market, twenty-five questionnaires in Jos main market and seventeen questionnaires in Bukuru market giving a total of eighty (80) questionnaires that were administered in all. The questionnaire were administered from February, 2024 till May, 2024. The data for the study were collected from the primary source and was collected using a structured questionnaire. The questionnaire was structured to reflect the objectives of the study. It contains sections where questions were asked on the objectives of the study such as socio-economic characteristics, marketing margin and marketing efficiency. The data for this research was analyzed using descriptive statistics, marketing margin and efficiency of potato marketers

Analytical Techniques

Descriptive Statistics

These are concerned with scientific methods for summarizing presenting and analyzing data as well as drawing valid conclusions and making reasonable decisions on the basis of such analysis. This is done with the aid of mean, percentage, frequency distribution etc

Mean: This is the sum values in the data group divided by the number of values it is the most useful and fundamental measure of location $\bar{X} = \frac{\sum fx}{\sum f}$ (1)

Percentage: This is proportion obtained by dividing the number of observations in each class by the total number of observations multiplied by a hundred percentage = actual change original amount x 100 (2)

Frequency Distribution: This is an organized display of data set which falls into each mutually exclusive class. Therefore, for easy comprehension of findings of this research and its contribution to knowledge it will be to grouped field data in the form of frequency distribution tables, bar charts, pie charts and percentage tables.

Marketing margin: This is the differences in prices of a commodity at different stages of time, place, form and possession as it moves from producer to the ultimate consumer. Olukosi *et al.*, (2005) defined margin as the differences in prices between that paid by the consumers and that obtained by the producer. The study utilized the modified form of marketing margin model adopted by Olukosi *et al.*, (2005), to determine the margin of the marketers in marketing system of potato in the study area. The model is specified as follows:

$$Mm = \frac{Sp - Pp}{Sp} \times 100 \dots\dots\dots (3)$$

Where: *Mm* = Marketing Margin; *Sp* = Selling Price and *Pp* = Purchasing Price

Marketing efficiency: This is the maximization of out-input ratio. The output connotes consumer’s satisfaction or utilities created in a marketing system, while the inputs are the different resources used. The cost is measurable but consumers’ satisfaction or benefits cannot be easily measured. Despite this set back, it has been widely used to measure market performance. The efficiency of potato marketing in the study area will be measured using this model.

The model is specified as $ME = \frac{\text{value added by marketing}}{\text{cost of marketing services}} \times 100$. (4)

Where; ME= marketing efficiency

Value added by marketing=retail price at consumers level less than producer’s price

Cost of marketing service=service cost of performing various marketing.

The decision rule is that if; Marketing efficiency (ME) >100 implies positive returns to business.

While if; Marketing efficiency (ME) > 100 implies negative returns to business.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Potato Marketers

The socio-economic characteristics of the marketers usually assist in getting the clear understanding of the behavior of the respondents. Moreover, several research findings have revealed that, the decision-

making process of an entrepreneur is affected by his biographic and socio economics (Danwanka and Ggala 2007). However, (Doss, 2004) opined that age, marital status and religion do not have much relevance other than for policy makers to understand the demographic characteristics of the respondents. Furthermore, the marketers’ socioeconomic characteristics considered in this study include age, sex, marital status, house-hold size, level of education, cooperative society, marketing experience and source of finance (Table 1).

Table 1: Socio-economic characteristics of potato farmers

Variables	Frequency	Percentage
Age		
26 – 35	12.0	15
36 – 45	34.0	42.5
46 – 55	20.0	25.0
56-65	8.0	10.0
> 65	6.0	8.0
Total	80	100.0
Sex		
Male	70.0	87.5
Female	10.0	12.5
Total	80.0	100.0
Marital Status		
Married	68.0	85.0
Single	12.0	15.0
Total	80.0	100.0
Educational Background		
Primary	6.0	7.5
Secondary	16.0	20.0
Tertiary	58.0	72.5
Total	80.0	100.0

Source: Field Survey, 2024

Age is an important factor in agricultural production and marketing enterprises. It affects the farmers and traders’ ability to acquire necessary inputs required for production and marketing process. The result from table 1a shows that the majority (42.5 %) of the respondents were within the ages of 36-45 years, followed by 25.0 % within the age range of 46-55 years and 8.0 % of age range of over 65 years were the minimum. Majority of the respondents (87.5 %) are male while 12.5 % of the respondents are female; 85.0 % of the respondents are married while 15 % are single. Most of the respondents have post-secondary school certificates, 72.5 % of the respondents have tertiary education this would definitely have a high impact on their marketing skills and productivity (Table 2).

Table 2: Socio-economic characteristics of potato farmers

Variables	Frequency	Percentage
Years of Experience		
<5	48.0	60.0
6 -10	26.0	32.5
11- 15	4.0	5.0
16 – 20	2.0	2.5
Total	80	100.0
Household Sizes		
<3	6.0	7.5
4 - 6	36.0	45.0
7 – 10	26.0	32.5
>10	12.0	15.0
Total	80.0	100.0
Cooperative Society		
Non - Member	56.0	70.0
Member	24.0	30.0
Total	80.0	100.0
Sources of finance		
Personal savings	54.0	67.5
Friends/Relatives	18.0	22.5
Commercial Bank	2.0	2.5
Local money lender	6.0	7.5
Total	80.0	100.0

Source: Field Survey, 2024

Household according to National Population Commission (NPC, 2006) is a group of persons staying under same roof or in the same house. They share the same source of food and think of themselves as a unit. The result in table 1b reveals that most of the respondents sampled were between 4-6 people in their households with 45.0 % followed by household size of 7-10 which has 32.5 %. The minimum household size with a percentage of 7.5 % is the household size of less than 3 family members. Adesina and kehinde (2008) stated that marketing experience enhances proper utilization of scarce resources, economic decision making as well as timely assessment of alternatives. The result from Table 2 reveals that from the marketers, 11-15 years categories were the majority with 60.0 %, and 6-10 years recorded 30.0 % while 5.0 % had less than 5 years' experience. This means that majority of the marketers had high years of experience in potato marketing. Finally, Majority of the marketers' source of finance is from personal savings with 67.5 % while funds from friends/relatives makes up 22.5 %.

Marketing Margin and Marketing Efficiency

Marketing margin represents the differences between price paid for potato by the marketers (producer price) and the price at which the potato was sold to the final consumers by the traders. Each category of marketer earns a sort of margin for the duties performed in the marketing channels Table 3).

Table 3: Marketing margin of potato marketers

Variable	Retailers @ ₦/12.5kg
Sales	1250.70
Purchasing price	855.80
Loading/Offloading	20.40
Cost of storage	10.56
Cost of market levy	5.90
Cost of losses	12.74
Marketing Cost (MC)	49.60
Total Marketing Cost (TMC)	905.40
Gross Marketing Margin (GMM)	394.90
Net Marketing Margin (NMM)	345.30
Return on Investment (ROI)	1.38
Marketing Margin (MM)	32.0

Source: Field Survey, 2024 and Author's Computation, 2024

Table 3 shows the result on marketing margin. For the marketers, per 12.5kg of potato, the purchase price was ₦855.80 and the cost of marketing services was ₦49.60 and the average sales was ₦1250.70 which give a gross marketing margin of 394.9 and a net marketing margin of 345.30. Return on investment of marketers was 1.38 however, marketing margin was 32.0. This means that potato marketing in the study area was profitable with return on investment of 1.38 meaning that for every one naira invested for 12.5kg potato, one will make return of 1.38.

Marketing Efficiency in Potato marketing

Marketing efficiency refers to the maximization of the ratio of output to input in marketing as presented in Table 4 below:

Table 4: Marketing efficiency of potato marketers

Variables	Retailers @ ₦/12.5kg
Marketing Cost	49.60
Purchasing Price	855.80
Selling Price	1250.70
Value added by marketing	394.9
Marketing Efficiency	796.16

Source: Author's Computation, 2024

The results in Table 3 show the marketing efficiency for 12.5kg potato which is high with 796.16 % for retailers. It implies that for every unit of resources on 12.5kg of potato in the study area from the production stage in the farm, the retail marketers generate approximately 8 times the value in returns as compared to the cost of production. Generally, it can be deduced that the marketing efficiency is high which implies that the system of marketing adopted by the marketer ceteris paribus will accrue more margins in their effort.

Constraints of Potato Marketing

The problems faced by the marketers were perishability nature of the potato, price fluctuation, lack of bargaining, poor road and high cost of transportation as presented in Table 5.

Table 5: Problems affecting potato marketers

Constraints	Frequency	Percentage	Rank
Perishable nature	72	90.00	1 st
High cost of Transportation	69	86.25	2 nd
Bad road	65	81.25	3 rd
Price fluctuation	60	75.00	4 th
Lack of bargaining	52	65.00	5 th

*Multiple response recorded

Source: Field Survey, 2024

From the study it revealed that the major constraint to potato marketing was perishable nature accounting for about 90 %, followed by high cost of transportation with 86.25%, bad Road had 81.25 % and price fluctuation having 75 %. In addition, Lack of bargaining rank 5th with 65. Marketing of horticultural crops such as potato is quite complex and risky due to the perishable nature of the produce, seasonal production and bulkiness. The study revealed that the major constraint to potato marketing is perishability which among other things can be due to how the crop was harvested, handled and stored.

CONCLUSION

From the findings marketing margin analysis indicated that for every 12.5 kg potato, Gross marketing margin was computed to be ₦ 394.9 whereas net marketing margin was calculated to be ₦ 345.3, return on investment was observed to be 1.38 however, and marketing margin value was 32.0. This means that potato marketing in the study area was profitable. The marketing efficiency for 12.5 kg potato was high with 796.16 %. Generally, it can be deduced from the marketing efficiency that the markets were efficient. Some challenges were identified to limit the effective marketing of potato in the study areas. From the survey, perishable nature of the crop accounted for about 90.00%, and the least rank constraints was lack of bargaining with 65 %. Potato marketers in the study area are doing well in terms of marketing efficiency and profitability.

LIMITATION

The research would have also covered Bokkos and Mangu LGA's potato farmers and marketers, but for the insecurity problems in the said areas, the research was limited to Barkin-ladi and Jos metropolis which is also an area of large potato production and marketing in Plateau state. Other researchers who understand the terrain of the earlier mentioned LGA's can explore the area to as well determine the marketing efficiency of potato in the area. There is also a limitation of inadequate data on potato marketing in the study area.

RECOMMENDATIONS

Based on the results of the analysis, the following recommendations are made for policy intervention in marketing of potato:

1. Provision of access to storage facilities
2. Construction of good road network to reduce damage of potato during transportation.

3. Extension services and interventions will be of importance to these marketers. This will minimize the exploitation from buyers; increase their handling, packaging, and storage skills.
4. The marketers can also involve themselves in production activities by organizing themselves into producer cooperatives. This will increase their scale of operation, and margins by reducing purchase cost.
5. There should be the reduction of the influence of intermediates on marketing

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