ANALYSIS Vol. 4, 2018

ISSN 2347–3819 EISSN 2347–386X

DISCOVERY Agriculture

A study of structure, conduct and performance of cowpea marketing in Lafia local government area of Nasarawa state, Nigeria

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Article History
Received: 29 March 2018
Accepted: 22 May 2018
Published: May 2018

Citation
Onuk EG, Abah D, Zaknayiba DB. A study of structure, conduct and performance of cowpea marketing in Lafia local government area of Nasarawa state, Nigeria. *Discovery Agriculture*, 2018, 4, 85-93

ABSTRACT

This study analyzed the structure, conduct and performance of cowpea market in Lafia local Government area of Nasarawa state. Results from the findings revealed that the difference in the marketing margin between the wholesalers and retailers was estimated at 21%, indicating an inequality in the marketing system between the wholesalers and retailers. The findings also revealed that the Gini coefficient values of 0.691 at both the wholesaler and retailer levels were obtained, suggesting a high degree of concentration. The gross margin of retailers per ton was estimated at ₦ 14,989.80 and a net income of ₦ 3,656.63per ton. The total variable cost

was found to be ₦ 98, 524.75. The total fixed cost was estimated to be ₦11,242.17, giving a total cost of ₦109,766.92. The findings further revealed that the gross margin and net income of wholesalers was estimated to be ₦ 27,369.82 and ₦8,793.15 per ton, the total variable cost was estimated to be ₦90,751.73 per ton. The total fixed cost per ton was ₦18, 576.67. The total revenue for retailers was N113,423.55 while that of wholesalers was estimated to be ₦118,121.55. Results from the findings also revealed that 31.0% (which ranked highest) of the respondents had lack of transport facilities as a constraint. Conclusion from the study showed that the marketing is characterized by large number of buyers and sellers, differentiation and in the services provided, barriers to entry, and high level of seller concentration. Structurally, the market is an imperfect competitive market. It was further recommended that the degree of seller concentration can be reduced by removing any hindrance to entry into the trade such as the provision of sufficient market stalls and spaces by government authority and enhancing the economic power of the traders by empowering them through micro credit facilities.

1. INTRODUCTION

Agriculture is recognized as one of the most challenging and risky enterprises. Hence, maximizing long-term profitability of farms is of utmost importance to farmers' wellbeing and competitiveness as well as the related people who engaged in this business to a larger extent Behjat *et al,* (2013). Apart from contributing the largest share of Gross Domestic Product (GDP), agriculture is the largest non-oil foreign exchange earner, the largest employer of labour and a key contributor to wealth creation and poverty alleviation in Nigeria (Adamu *et al.* 2013).

Several food crops are grown in Nigeria for food and income generation, this include, beans, groundnut, rice, sorghum, maize cowpea among others. This study would concentrate on cowpea (*Vigna unguiculata L. Walp*.) and the structure, conduct and performance as a food and an income generating crop. Onuk (2016), explained that cowpea as a legume crop is usually intercropped with cereal crops like maize, millet and guinea corn. This intercropping has gone a long way to improve the already limited fertility profile of many farming plots.

Thus, Bakoji *et al.* (2013) observed that, several constraints including high cost of transportation, lack of credit facilities, in sufficient funds, price fluctuation and lack of good storage facilities among others affect the profit margin of cowpea marketers and other marketing activities in Nigeria.

Cowpea (*Vigna unguiculata L. Walp*.), is one of the most ancient crops known to man. Its origin and subsequent domestication is associated with pearl millet and sorghum in Africa. It is now a broadly adapted and highly valued crop, cultivated around the world primarily for seed, but also as a vegetable (for leafy greens, green pods, fresh shelled green peas, and shelled dried peas), a cover crop and for fodder. Cowpea is considered more tolerant to drought than soybeans and better adapted to sandy soils. Many cowpea cultivars have a vining growth habit, but modern plant breeding has also led to more upright, bush-type Cultivars, Abah *et al,* (2012).

Cowpea is an important source of plant protein in the developing world and most especially in West Africa; it is the most important economically and nutritionally indigenous African legume crops, especially in West and Central Africa (WCA). Cowpea is rich in protein and constitutes a staple food for people in rural and urban areas, Baributsa, *et al* (2010). It can be consumed alone when cooked or mix with other foods such as rice, maize, millet, plantain, yam, gari, etc. Large quantity of cowpea is also consumed as deep oil fried product called "akara" and a steamed product called "moin-moin' in most parts of Nigeria.

Onuk *et al.* (2017), reported that cowpea is considered to be the most important staple food grains, rich in quality protein and has contents almost equivalent to that of cereal grains. It is cultivated primarily for grain and also as vegetables, a fodder and cover crops in the dry Savannah of Tropical Africa both in the rural and urban dwellers. Nigeria remains the largest producers and consumer of cowpea both in West Africa and in the world.

As revealed by Afolami (2001), cowpea is an important staple food in Nigeria which is being produced for domestic consumption. It is a veritable source of protein which may be capable of providing remedy to the protein- carbohydrates nutrition imbalance of the Nigerian populace. Similarly, it is considered as an industrial raw material, income earner, livestock feed as well as its capability of improving and reconditioning of the fertility of soils (Quinn, 2007).

Increased cowpea production from intensified cropping system can play a key role in income generation in West Africa because of the multiple uses of cowpea grain and fodder in human and animal diets. Economically, cowpea has a great value in the internal trade in the country because it promotes trade between the production area and non-producing area. It also serves as a source of income for middlemen who embark on transportation from one place: to another. The returns from cowpea marketing like any other business firm ensures sustainability of the system through enhance revenue generation to both marketers and producers. However,

the challenge that marketers face is to satisfy consumer's wants at a reasonable profit level and in a socially acceptable manner (Kotler, 1990).

The need for the marketing system of cowpea to be well structured and efficiently organized cannot be over emphasized. It enhances the pace of economic development by encouraging specialization, generation of foreign exchange earnings, development of an exchange economy, provision of income and employment opportunities for marketing agents, (Olukosi *et al.,* 2005).

While Market performance on the other hand, is the assessment of how well the process of marketing is carried out and how successfully its aims are accomplished (Giroh, *et al.* 2013).

However, in marketing system, the structure, conduct and performance of a market is one of the most important approaches to analysis of market. This encourages the participation of a large number of individuals at various types of markets and exchange points where the marketing services of assembling, storage, processing, transportation and break-of-bulk are performed. An important variable in market structure analysis is concentration, which shows a situation in which a few large firms have the largest share of business. The effects of market structure, conduct and performance can go a long way in affecting the supply response of agricultural products, especially in cowpea processing and marketing. Cowpea marketers face a number of problems; notable among them are insect pest infestation, inadequate storage facilities, high cost of transportation, poor credit facilities, inadequate market infrastructure, and lack of uniform measure and long chain of distributors.

Other constraints according to Ajetomobi and Abiodun (2010) include drought, flooding, salt stress and extreme temperatures, all of which are expected to worsen with climate change which could subsequently reduce crop productivity and marketing activities.

Justification of the Study

Agricultural marketing is the main driving force for economic development and has a guiding and stimulating impact on production and distribution of agricultural produce. The increasing proportion of the population living in urban centers and rising level of income require more organized channels for processing and distributing agricultural products. The weak performance of agricultural markets (both input and output markets) in Nigeria has been recognized in various studies as a major impediment to growth in the agricultural sector and the overall economy (Giroh *et al.,* 2013).

Olukosi *et al.* (2005), also explained that the flow of agricultural produce from the producer to the consumer involves a long chain of intermediaries, who, without creating value-added, merely keep on stretching the chain. He further pointed out that the involvement of these superfluous intermediaries has constrained the development of the sector and deprived the farmers of equitable returns. Mohammed (2007) also clearly stated that the knowledge gaps in the crop sector in Nigeria were inefficiency of the market system which includes inefficient marketing chain, improper transmissions of price to producers and the type of product produced by farmers i.e. whether it satisfies the consumers taste and preference.

Improving marketing facilities for agricultural crops in general and cowpea sector in particular enables farmers to plan their production more in line with market demand, to schedule their harvests at the most profitable times, to decide which markets to send their produce to and negotiate on a more even footing with traders. However, the nature of the product on the one hand and the lack of organized market system on the other have resulted in low producers' price. Despite the significance of cowpea in the livelihood of many farmers and income generating crop in the study area, it has not been given due attention. It is only recently that few studies have been done on cowpea. However, most of these studies have focused on production and were limited to a specific area and marketing aspects. Systematic and adequate information on the market structure, conduct and performance were not well identified. Furthermore, cowpea marketing channels and their characteristics have not yet been studied; hence, this study attempts to fill in these gaps.

Marketing is the most important aspect in the development process. This is obviously due to the fact that development basically means larger size productive activities in the economy. But we cannot have more of production unless the goods produced are actually sold out and selling depends on the proper marketing conditions (Prasad and Prasad, 2005).

The importance of this study is to producers and to all actors in the marketing system. The performance of marketing of cowpea has impact on the income of producers, processors, traders and consumers too. This information could help farmers, consumers, traders, investors, and others, who need the information for their respective purposes. Since Lafia is composed of numerous marketing outlets where cowpea is sold on daily basis, detailed information on how the cowpea market is currently functioning and identifying the pros and cons of the marketing system would help governmental and non-governmental organizations to design appropriate intervention measures. Besides, the document also would serve as a reference for researchers to embark upon similar or related work in other parts of the country.

Objectives of the Study

1.analyze the structure, conduct and performance of cowpea marketers

2.describe the marketing margin of cowpea marketers in the study area;

3.identify major constraints associated with cowpea marketers in the study area.

2. MATERIALS AND METHODS

The study was conducted in Lafia Local Government Area LGA. Lafia Local Government Area is within the capital of Nasarawa State, Nigeria. Lafia is the capital of Nasarawa State and is located within the Guinea Ecological/Savannah of middle belt zone or central region of Nigeria. It is located within longitude $8^0 33'$ North of the equator, and between latitude $8^0 32'$ East of the Green Which Meridian. Lafia L.G.A. shares boundaries with Nasarawa – Eggon Local Government Area in the North, Obi Local Government Area in the South, Doma Local Government Area in the West and Quan-pan Local Government Area of Plateau State in the East. Lafia has a landmass of 2799.531 sq km with a projected population of 330,712 inhabitants according to (NPC, 2006).

Lafia is characterisized by two seasons, the rainy and dry season. The rainy season normally starts from late April and lasts till October, with annual rainfall of about 1500mm. Highest rainfall is usually experienced in the months of July, August and September. The dry season commences in November and lasts till late March. The major tribes in the area include; Eggon, Gwandara, Kamberi or Kanuri, Alago, Migili, Hausa, Fulani, Akye, Tiv and Rindre.

The major occupation of the people is farming. The soil structure of the area is sandy-loamy, which is suitable for agricultural production. The people engage in crop production such as cassava, yam, rice, maize, millet, guinea corn (Sorghum), beniseed (Sesame), groundnut, cowpea, soya beans and melon while tree crop includes: mangoes, cashew, citrus, palm tree and rearing of livestock like cattle, sheep, goat, pig and poultry etc.

Lafia Local Government Area has 6 districts namely, Lafia Central, Lafia East, Lafia North, Lafia West, Akunza, and Agyaragu Tofa. Lafia Local Government Area has twelve (12) political wards which are: Chiroma 1, Chiroma 2, Gayam, Wakwa, Akikya, Wambai, Akurba, Shabu, Kwandere, Adogi, Ashige and Assakio.

Data was collected on the various fixed and variable costs involved in the marketing of cowpea. The fixed cost includes the costs of renting a shop and also cost of renting land. The various variable costs include cost of cowpea purchase, cost of transporting cowpea, cost incurred in settling commissioning agents, and sale tax. Data from Lafia main market was collected daily because the markets operate on daily basis, while data from Alamis market and shabu market was collected weekly (every Thursday of the week for Alamis and every Saturday Shabu market) within a period of three (3) weeks.

Sampling Procedure and Data analysis

The study consisted of three major markets in Lafia Local Government Area of Nasarawa State. The markets include; Alamis market day, Lafia main market, and Shabu market day. These markets are purposely selected based on the high concentration of cowpea marketers. The respondents were selected using simple random sampling techniques in proportion to the size and number of cowpea marketers. The sample selection comprised of 75 cowpea marketers from which 35 respondents were selected from Lafia main market, 25 from Alamis market day and 15 from Shabu market day. (However, 74 respondents were used for the study because one of the questionnaires had responses that were inconsistent; hence it was treated as an outlier).

Data collected covered relevant information on the cost of marketing cowpea by the various stakeholders in the various markets. This consists of the cost of transportation, cost of purchase, cost of incurred on tax, cost of the various commission agents, and cost of land.

Primary data was used for this study which was generated using structured questionnaire that was administered on randomly selected 75 respondents. Also secondary data was also used which was derived from the internet and relevant website. The data also covered relevant information on the objectives of the study.

The structure of the market was measured using Gini Coefficients. The Gini Co-efficient measures the degree of market concentration for cowpea marketers and is given by:

$$G = 1 - \Sigma xy$$

Where: G = value of the Gini coefficient, X = percentage of market participants, Y = cumulative of purchase (cowpea), Σ = summation sign.

Gini coefficient is equal zero when there is perfect equality in the size and distribution of buyers or sellers, and G = 1 when there is perfect monopoly in the market. Generally, Gini coefficient value ranges from zero to one and expresses the extent to which market is concentrated. The Gini coefficient is a numerical representation of degree of inequality in the distribution.

The conduct of the market was measured using the marketing margin, mean and percentages of the various wholesalers and retailers of cowpea in the study area. This is measured in terms of the various costs of handling the commodity till it gets to the final consumers.

Mm = Mean selling price – (mean purchase price + mean marketing price).

$$\text{Market margin performance (in \%)} = Mm = \frac{SP - CP}{SP} \times 100$$

Where:
Mm = Marketing Margin of cowpea in Naira
Sp = Selling Price in Naira
Cp = Cost Price in Naira
Marketing performance was measured using gross margin and marketing Margin Analysis. This can be explained below:

GM = TR -TVC

Where:
GM = Gross Margin (in naira/50kg).
TR = Total revenue (in naira/50kg).
TVC = Total Variable cost in naira per50kg.

Therefore, Gini coefficient and marketing margin analysis were used to satisfy objective i, Gross Margin was used to satisfy objective ii and descriptive statistics such as percentages was used to satisfy objective iii.

3. RESULTS AND DISCUSSION

Market Structure of Cowpea Marketers (Wholesalers and Retailers)

The result in Table 1a below shows that the distribution of the traders(Wholesalers and Retailers) by average size and total of mean weekly sales suggest a high degree of sellers concentration as indicated by the Gini coefficient values of 0.691. This is in line with Elizabeth *et al.,* (2001); who studied market structure and the degree of competition in maize hybrid seed retailing and wholesaling, they observed that the structure and conduct of the market in Trans Ngozi District, in western Kenya was highly concentrated with high number of buyers and sellers and with a Gini coefficient of 0.6 with the market being categorized as oligopolistic. They also revealed that conditions for competition were lacking mainly due to barriers to entry such as institutional restrictions and high initial capitals.

Table1b further revealed that the means marketing margin analysis of wholesalers' cowpea marketers in the study area was estimated at 34% and ₦6, 015.37 while that of the marketing margin of retailers' cowpea marketers was estimated at 13% and ₦2, 917.90. This indicates that the retailers' marketing margin is lower compared to that of the wholesalers' marketing margin. This implies that the retailers make less profit than the wholesalers in cowpea marketing in the study area. The difference in the marketing margin was estimated at 21% indicating an inequality in the marketing system between the wholesalers and retailers. The inequality in the margin between the wholesalers and retailers may be due to the differences in the degree of risk in sourcing for supplies and the wholesalers have more capital base, better access to information and better bargaining power. These advantages tend to discourage new entrants into the wholesale trade. Other characteristic features may also include barriers such as the registration process for new entrants at the wholesale level (Taru *et al.,* 2010).

Cost and Returns Associated with Cowpea Marketing for Retailers and Wholesaler

Table 2 below shows costs and returns associated with cowpea marketing by retailers in the study area, the findings reveals that gross margin of retailers per ton was estimated at ₦ 14,989.80 and a net income of ₦3,656.63per ton. The total variable cost was found to be ₦ 98, 524.75, while the amount expended on purchasing cowpea attributed ₦ 93.80 percent of the total variable cost. The total fixed cost was estimated to be ₦11,242.17, giving a total cost of ₦109,766.92. The result therefore indicates that the gross

margin and net income of retailers are lower than those of wholesalers. This is because average marketing cost of wholesalers tends to be lower than that of retailers. The result further indicates that, cowpea marketing in the area is profitable by the positive sign of the gross margin.

Table 1a Gini coefficient of cowpea marketers (Wholesalers and Retailers)

Mean weekly Sales	Percentage of total sale	Cumulative percentage(Y)	ΣXY
28,720	3.0	3.0	0.0077
79,560	8.2	11.2	0.026
120,400	12.4	23.6	0.032
197,320	20.4	44.0	0.042
220, 575	22.8	66.8	0.12
322, 627	33.2	100	0.081
969,102	**100**		**0.3087**

Source: Field survey, 2017

Gini coefficient = 1-0.309 = 0.691

Table 1b Mean Marketing Value of Cowpea Marketers

Market participant	Price per 50kg of cowpea	Mean marketing cost	Mean selling price per 50kg bag	Marketing margin
Retailer	31,000	1,783.21	35,70111	13%
Wholesaler	21,500	3072.97	32,588.55	34%

Source: Field survey, 2017

Table 2 Gross margin of retailers and wholesalers of cowpea per ton in naira

Item	**Retailers**		**Wholesalers**	
	Amount (kg/N)	**Percentage**	**Amount (kg/N)**	**Percentage**
Variable cost				
Cowpea (purchases)	92,420.00	93.80	87,110.21	95.9
Transportation	2,122.20	2.20	2,938.10	3.2
Sales tax	178.22	0.18	158.45	0.17
Loading/offloading	389.8	``3e	342.55	0.38
Security	131.11	0.13	78.98	0.087
Commission agent	283.44	0.29	123.44	0.14
Total variable cost	**98,524.75**	**100.00**	**90,751.73**	**100.00**
Fixed cost				
Rent	11,242.17		18,576.67	
Total fixed cost	**11,242.17**		**18,576.67**	
Total cost	109,766.92		109,328.40	
Total revenue	113,423.55		118,121.55	
Gross margin	14,989.80		27,369.82	
Net income	3,656.63		8,793.15	

Source: Field survey, 2017

The findings of cost and returns of wholesalers associated with cowpea marketing in study area revealed that, the gross margin and net income of wholesalers was estimated to be ₦ 27, 369.82 and ₦8, 793.15 per ton respectively. While the total variable cost was estimated to be ₦90, 751.73per ton with amount spend on purchase of cowpea from producers accounted for 95.90% of total

variable cost. The total fixed cost per ton was ₦18,576.67. The total revenue was estimated to be ₦118,121.55. However, this finding revealed that cowpea marketers practicing wholesaling are efficient in the marketing of the commodity by virtue of the positive sign and magnitude of the gross margin and net incomes. This makes cowpea highly valued and profitable in the study area. The difference in the margin between the wholesalers and the retailers may be due to the differences in the degree of risk in sourcing for supplies and the wholesalers have more capital base, better access to information and better bargaining power. This advantage could help reduce their marketing cost. Furthermore, the existence of the high degree of seller concentration may be due to the characteristic features of the cowpea market and collusive practices in buying and selling. The assertion of wholesalers having more access to market facilities and information sources may adversely affect the quality of cowpea handled, hence, reduction in sales earning. This high level of seller concentration coupled with the above features indicated that the cowpea market is an imperfect competitive market.

Major Constraints Associated with Cowpea Marketers

Results from the findings in Table 3 revealed that 92% of the respondents had poor storage facilities as their constraints. This may be due to the high cost of constructing or purchasing modern storage facilities by the marketers which has direct effect to the marketing system. This is consistent with the findings of Seid *et al.,* (2013) who found inadequate storage facilities, inadequate transport facilities, pests and diseases to be significant factors contributing to postharvest losses of cowpea and commercial horticultural crops respective. Results from the findings also revealed that 96% of the respondents lack transport facilities as a constraint. This finding agrees with that of Abdulrahman *et al.,* (2015) and Onuk *et al.* (2010) who observed that high cost of farm inputs, inadequate capital and government interference, inadequate transportation facility and inadequate storage/processing facilities were among the constraints faced by farme. It was also revealed from the findings that 72% of the cowpea marketers' incurred high cost of transporting their products as a constraint affecting their marketing system. Adeleke *et al.,* (2010) stated that the main reasons for inefficient marketing of Okro on Osun state was attached to inadequate extension service and high cost of transportation. Results from the findings further showed that 49.3% (which ranked least) of the cowpea marketers had lack of labour that could help them to load and off-load their goods. This may be due to the cost involved in carrying out these activities.

Table 3 Major Constraints Associated with Cowpea Marketers

Constraints	Frequency	Percentage
Lack of storage facilities for goods	69	29.7
Lack of transportation facilities	72	31.0
High cost of transporting the goods to the market	54	23.3
Lack of labour for loading and off-loading	37	15.9

Source: Field survey, 2017

Multiple responses were allowed.

4. CONCLUSION AND RECOMMENDATIONS

Results from the findings revealed that the difference in the marketing margin between the wholesalers and retailers was estimated at 21%. The findings of the study also revealed that the Gini coefficient values of 0.691 at both the wholesaler and retailer levels were obtained. Also, gross margin of retailers per ton was estimated at ₦ 14,989.80 and a net income of ₦ 3,656.63per ton. The total variable cost was found to be ₦ 98, 524.75, while the amount expended on purchasing cowpea attributed ₦ 93.80 percent of the total variable cost. The total fixed cost was estimated to be ₦11,242.17, giving a total cost of ₦109,766.92. The findings further revealed that, the gross margin and net income of wholesalers was estimated to be ₦ 27, 369.82 and ₦8, 793.15 per ton respectively. While the total variable cost was estimated to be ₦90, 751.73per ton with amount spend on purchase of cowpea from producers accounted for 95.90% of total variable cost. The total fixed cost per ton was ₦18,576.67. The total revenue was estimated to be ₦118,121.55. The findings also revealed that 31.0% (which ranked highest) of the respondents had lack of transport facilities as a constraint.

There is a positive relationship between trading experience, total value of weekly sales and marketing margin both at the wholesalers and retailers level. The marketing is characterized by large number of buyers and sellers, differentiation and in the services provided, barriers to sentry, and high level of seller concentration. Structurally, the market is an imperfect competitive market. The values of the economic indicators used suggest some degree of structural inefficiency in the marketing system. Also,

cowpea marketers in the study area had some constraints affecting their marketing activities and were also lacking basic supporting services in their marketing activities. The research concluded by recommending that the degree of seller concentration can be reduced by removing any hindrance to entry into the trade by providing sufficient market stalls and spaces by government authority, and also enhance the economic power of the traders by empowering them through micro credit facilities. There should be improved market information to enable traders collect, analyze and disseminate information on prices, demand and supply situation for cowpea and other staple food items using radios, newspapers, bulletins, amongst others. Finally, the introduction of extension education programmes for market traders will improve their knowledge and skills so that the marketing system becomes responsive to consumers' demand.

Funding:
This study has not received any external funding.

Conflict of Interest:
The authors declare that there are no conflicts of interests.

Peer-review:
External peer-review was done through double-blind method.

Data and materials availability:
All data associated with this study are present in the paper.

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