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Research Paper

Effect of marketing intermediaries on pricing of agricultural perishable products: A case study of onions and tomatoes in Benue State, Nigeria

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Abstract. The study examined the effect of marketing intermediaries on pricing of agricultural perishable products in Benue State, Nigeria. Multistage sampling technique was employed to select 300 tomato and onion marketers in the study area. Primary data were collected using well-structured questionnaire administered on respondents. Data collected were analyzed using descriptive statistics, pricing efficiency and gross margin. The study revealed that majority (57.3%) of the respondents were female, 49.3% were married with a mean age of 38 years and a mean annual income of ₦72,603.67. The result also revealed a mean gross margin of ₦7,757.62 and ₦3,470.79 for onions and tomatoes respectively indicating that the enterprise were profitable. The result also showed pricing efficiencies of 1.84 and 5.19 for tomatoes and onions indicating that both products were efficient in the study area. Storage facilities problem constituted the greatest challenge faced by the marketers of onion and tomatoes in the area. Based on the findings, it was recommended that 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 points of consumption.

Keywords: Vegetables, gross margin, market, marketing.

INTRODUCTION

Perishable agricultural products are the kind of foods that go bad rapidly if a preservation technique is not employed. They require timely harvesting, efficient transportation and advanced storage and processing. The perishables lack the hard texture of cereal or grain, legumes and thus are very susceptible to spoilage. Examples of perishable agricultural products include fruits and vegetables such as onions, tomatoes, oranges, water melon, banana, apple, pineapples etc. Fruits and vegetables are of great nutritional value. They are important sources of vitamins and minerals thus essential component of human diet. They help in protecting our body against cancers, diabetes and heart diseases. Vegetables provide essential amino acid which the body needs to survive (Agbugba *et al*., 2011). Vegetable production forms a substantial percentage (about 25%) of major food crops cultivated in the tropics and so it is the source of livelihood for a considerable section of the population (Kra and Borni, 1988).

Vegetable production is on the increase in most countries of the world, for instance, in Nigeria, vegetable growth rate stood at 2.18 percent between 1970 and 1980. It however increased to 5.7 percent between 1980 and 2000. Between 2000 and 2006, it rose to about 14.0 percent. Vegetable production constitutes about 4.64 percent of the total stable food production between 1970 and 2006 in Nigeria (CBN, 2007). Fruits and vegetables are of great nutritional value, and essential components of human diet. Consequently, there had been increased trade/commerce activities surrounding these commodities

(Egharevba, 1995). In spite of their importance in the diet, per capita consumption of fruits and vegetables in the developing world is only 100 g, compared with 220 g in the more advanced countries (Messiaen, 1992). In Nigeria, enormous quantities of fruits and vegetables are produced. For example, 3.8 million tons of onions, 6 million tons of tomatoes, 15 million tons of plantain and 35 million tons of citrus have been quoted as annual production levels for some fruits and vegetables, which are real large quantities of food crops (Oghogho *et al*., 2014).

However, losses as high as 50% are common in fruits and vegetables between rural production and town consumption (Oyeniran, 1988). These losses, as it is noted occurred during transportation, storage and marketing (Idah *et al*., 2007; Okhuoya, 1995). The marketing of fruits and vegetables warrant special attention due to their high perishability and unaffordable prices. Besides, many producers do not sell their products directly to the final consumers, as the consumers perform one task or the other as propounded by Busch and Houston (1985) in the gap theory. The gap theory is of the premise that marketing needs not exist until a social economy reaches the point where the producers of economic goods are not the consumers of same. This situation creates a gap. For this gap to be bridged there must be intermediaries or middlemen like the wholesalers, retailers, merchant middlemen, agent middlemen, commissioned and non-commissioned agent (Anyanwu, 2000). These people buy from the producers and resale or make it available to the consumers/users.

Marketing intermediaries (middlemen) are organizations or individuals who specialize in certain marketing operations such as assembling, sorting, cleaning, packaging, transportation and holding products till they are bought by consumers. They are indispensable in the distribution of consumer goods and services. According to Kotler (1998), the use of intermediaries results from their greater efficiency in making goods available to target markets, through their contacts, experience, specialization and scale of operation usually offer the form and consumers more than it can achieve on its own but with a price. These people buy farm products at cheaper price and sell it to the consumer at higher price.

Prices are the result of the functioning of the market and are determined by supply and demand which, in turn, is influenced by the costs of production, the costs of marketing and consumer preferences, among other things. Generally, the price fluctuation of fruits and vegetables is higher than other agricultural products (Bambang, 2007). Middlemen are the key persons in the Nigerian fruit and vegetable marketing channel that brings the farm product to the ultimate consumer. In this regard, they have to bear a high cost and risk. Generally, purchasing, transporting, loading and unloading, grading, storage, wastage and price risk are the major cost components. Rupasena *et al*. (2008) explain that the total marketing cost includes the cost involved in moving the product from the point of production to the point of consumption.

For distribution system to be efficient therefore, the product needs to get to the final users within 2 to 14 days after harvest by the farmers. The cost of operations are heightened as wholesalers frequently travel to the market where the retailers are waiting for the product, and as the retailers transport the product to the market where it is sold to the ultimate users. The challenge facing middlemen are now to hold an optimal level of stock on a daily or weekly basis due to problem of storage. As a result of inadequate storage facility and the problem of non-standardized weight of measurement, the middlemen buy from the farmers as much quantity that can be sold in a short period. It is against this background that the study is designed to determine if the activities of the intermediaries have effect on pricing of agricultural perishable products. The specific objectives were to:

i. Describe the socio-economic characteristics of tomatoes and onions marketers in Benue State;
ii. Analyze the costs and returns associated with tomatoes and onions marketing in Benue State;
iii. Determine the price efficiency of tomatoes and onions marketing in the study area;
iv. Identify the constraints in the marketing of these perishables in the study area.

METHODOLOGY

Study area

The study was conducted in Benue State of Nigeria specifically in the following Local Government Areas: Ado, Agatu, Apa, Gwer-West, Katsina-Ala Logo, Obi, Oju, Okpokwu, Tarka, Ukum, Makurdi, Gboko, Gwer-East and Ushongo. The State is located in the North-Central part of Nigeria between latitudes 6°25′ N and 8°8′ N and longitudes 7°47′ E and 10° E. The State shares boundaries with five other States namely: Nasarawa to the North, Taraba to the East, Cross River to the South, Enugu State to the South West and Kogi to the West (Benue State Agricultural and Rural Development Authority (BNARDA), 1995). It also shares a common boundary with Republic of Cameroon on the South-east and occupies a land mass of 30,955 square kilometers with a population of 4,219,244 people [National Population Commission (NPC), 2006].

Tomato and onions are predominantly produced in 15 Local Government Areas of the state, due to favourable climatic and soil conditions. The State's soils are sandy-loam, sheaves basement complex and alluvial plains. The State enjoys a tropical climate with two distinct seasons. The rainy season is from April to October, while

the dry season is from November to March. The annual rainfall in the State ranges from 150 to 180 mm. The temperature fluctuates between 23 and 30°C. The State stretches across the transition belt between forest and savannah vegetation (ESFAJ and Partners, 2012).

Benue State is the nation's acclaimed food basket because of the abundance of its agricultural resources. The State is a major producer of food and cash crops (BNARDA, 1995). Farmers who are engaged in arable crop production like yam, cassava, sweet potato, maize, rice, vegetables, soya-beans as well as livestock like poultry, goat, sheep, piggery, cattle, and fish also abound in the state. Also agribusiness entrepreneurs who are involved in yam distribution/marketing, yam chips and flour production abound in the State (Okeke *et al*., 2015).

Population and sampling technique

The population for this study consisted of all tomato and onion marketers in Fifteen (15) Local Government Areas in the State. The Local Government Areas are Ado, Agatu, Apa, Gwer-West, Katsina-Ala, Logo, Obi, Oju, Okpokwu, Tarka, Ukum, Makurdi, Gboko, Gwer-East and Ushongo Local Government Areas of Benue State.

A sample of 300 vegetable crop marketers engaged in tomatoes and onions marketing were selected using multi-stage sampling technique. In the first stage 10 Local Government Areas were randomly selected from the 15 LGAs of the State with high concentration of vegetable marketers. In the second stage, five wards were randomly selected from each of the 10 LGAs making a total of 50 wards. In the third stage, from each of the selected wards, three tomatoes and three onions marketers were selected randomly giving a sample size of 300 vegetable marketers engaged in tomatoes and onions.

Data collection and analysis

Primary data were collected, using structured questionnaire on the socio-economic characteristics of tomato marketers, structure, pricing efficiency, and constraint associated with tomato 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 examined by appropriate experts independently. The experts gave their critical opinion on the adequacy and relevance of the instrument to the objectives of the study. The observation was harmonized and necessary corrections were effected on the instrument before the field survey commenced. 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 a 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 and inferential statistics. The descriptive statistics such as mean, frequency and percentages were employed to analyze the socio-economic characteristics of tomato and onion marketers in Benue State while Pricing efficiency, Gross margin and Likert scale formula were used to analyze the effect of marketing intermediaries on pricing of tomato and onion in the study area.

Models specification

Gross margin analysis

Gross margin was used to analyze the costs and returns associated with tomatoes and onions marketing.
Gross Margin (GM) = value of enterprise output – variable costs

$$\mathrm{GM} = \mathrm{TR} - \mathrm{TV}$$

GM = Gross Margin (Naira/50 kg basket)
TR = Total revenue (Naira/50 kg basket)
TVC = Total variable Costs (Naira /50 kg basket)

Pricing efficiency

Marketing efficiency was calculated using the formula given by Khols and Uhl (1967) which was used by Olukosi and Isitor (1990) and later used by Babatunde and Oyatoye (2000) in estimating the marketing efficiency of maize in Kwara State.
The formula specified that:

$$\text{Pricing Efficiency} = \frac{\text{value added by marketing activities}}{\text{marketing costs}} \times 100$$

In order words, pricing efficiency = $\frac{\text{Net margin}}{\text{Marketing costs}} \times \frac{100}{1}$

Likert scale formula

Likert Scale formula was used to analyze the constraints associated with tomatoes and onions marketing.

$$\mathrm{X} = \frac{\sum \mathrm{X_i}}{\mathrm{N}}$$

Where n = 1, 2, 3, 4 ……..n

N = the number of occurrence
X = the assigned value of constraint
$\sum$ = summation sign
Where:
X_1 = transportation
X_2 = poor packaging
X_3 = rough handling
X_4 = high temperature
X_5 = method of storage
X_6 = selling at reduced price

RESULTS AND DISCUSSION

Socio-economic characteristics of tomato and onion marketers

The socio economic characteristics of the respondents which include sex, marital status, age, annual income, household size, education and marketing experience are presented in Table 1. The result of the findings showed that the majority (57.3%) of the respondents were females. The implication is that these marketers (women) are more likely to have higher marketing efficiency due to high level of experience as women are confined to marketing of these commodities while men are confined to their production. This agrees with Sanusi and Dada (2016) who observed that due to gender role in the society, women are mostly involved in the marketing of agricultural produce while men are the major producers.

The distribution of respondents according to marital status revealed that most (49.3%) of the respondents were married. The implication is that these marketers are more likely to have higher marketing efficiency as the responsibilities that come with marriage make these marketers to adopt innovative marketing practices which translates to higher marketing efficiency. This conforms to Tiri *et al*. (2015) who revealed that married marketers were more efficient compared to single ones due to joint decision, mutual effort and strength in selling activities.

The result further showed that the majority (67.7%) of the respondents were in the age bracket of 37 to 47 years with a mean age of 38 years. This implies that the vegetable marketers in the study area are in the active age and hence, more likely to have higher marketing efficiency owing to their better understanding of market situation compared to older marketers. This agrees with Tiri *et al*. (2015) who revealed that the older the trader becomes, the less efficient he/she tends to be as traders who are younger in age take more discrete decisions and are able to read the market situation better than those who are older.

Moreso, the result revealed that the mean annual income of the marketers in the area was ₦72,603.67. The high mean annual income implies that these marketers are more likely to have higher marketing efficiency since such high income influence adoption of improved marketing practices which translates to higher marketing efficiency. This result conforms to Sanusi and Dada (2016) who reported a positive relationship between household income and marketing margin.

Similarly, the findings showed that majority (65.7%) of the respondents had household size of 4-8 persons with a mean household size of 8 persons. The implication is that the vegetable marketers in the area are more likely to have higher marketing efficiency as such large household size decreases demand for hired labour and thus, reducing marketing cost. This agrees with Obasi and Emenam (2014) who revealed that the large household size would help increase the marketing efficiency of the marketers because less hired labour would be used and most of the duty involved in marketing would be performed by the household and hence, reducing cost and increasing the efficiency of the market.

Furthermore the result showed that majority (65.3%) of the respondents had been in vegetable marketing between 4-9 years with a mean marketing experience of 9 years. This shows that vegetable marketers in the area are old in the enterprises and such level of experience can also determine the level of knowledge and information in the business and hence, higher level of marketing efficiency. This finding agrees with Aminu (2009) that experience is very vital in the adoption of innovation which translates to improved business performance.

The distribution of the marketers by educational level revealed that majority (56.3%) of the marketers had up to primary education. This means that those involved in vegetable marketing in the area were literate and hence, more likely to have higher marketing efficiency since they are able to adopt innovative marketing practices. This finding conforms to Ajayi and Mbah (2007) who observed that the literacy level of traders to a large extent determines the strategies and skills which may be used to adopt new techniques in terms of storage and record keeping which would increase their profit.

Analysis of cost and return for tomato and onion marketers

The result of the cost and return analysis of the two vegetable crops is presented in Table 2. The total variable cost in the marketing of the 2 vegetable crops i.e onions and tomatoes were ₦494.47 and ₦199.13 respectively. The difference in the variable cost of the two products was as a result of the difference in the various cost involved in marketing. For example more cost is incurred in onions marketing than tomatoes. The mean total sales for onions and tomatoes were ₦8252.09 and ₦3669.92 respectively. This implies that these marketers operated at different levels of markets and different factors which tend to affect their cost levels. The results also revealed a mean gross margin in each enterprise

Table 1. Socio-economic characteristics of onion and tomato marketers (n=300).

Variable	Frequency	Percentage (%)	Mean
Sex			
Male	128	42.7	
Female	172	57.3	
Marital status			
Single	95	31.7	
Married	148	49.3	
Divorced	31	10.3	
Widow(er)	26	8.7	
Age (years)			38 years
≤25	3	1.0	
26-36	86	28.7	
37-47	203	67.7	
≥48	8	2.7	
Annual income (₦)			₦72,603.67
≤20000	8	2.7	
20001-71000	144	48.0	
71001-122000	129	43.0	
122001-173000	15	5.0	
≥173001	4	1.3	
Household size			8 persons
≤3	1	0.3	
4-8	197	65.7	
9-13	101	33.7	
≥14	1	0.3	
Experience (years)			9 years
≤3	3	1.0	
4-9	196	65.3	
10-15	90	30.0	
≥16	11	3.7	
Educational level (years)			6 years
≤3	62	20.7	
4-7	169	56.3	
≥12	69	23.0	

Source: Field survey (2019).

combination of the vegetable crops were ₦7,757.62 and ₦3,470.79 for onions and tomatoes respectively. This implies that marketing of these vegetables crops is a profitable venture in the study area and so more people are advised to go into the business. More so, it was found that onions have the highest gross margin this could be due to the fact that onions have low perishability.

Pricing efficiency of tomato and onion marketing

Analysis of Table 3 showed that the pricing efficiency of

Table 2. Cost and return analysis of tomato and onion marketers.

Variable cost	Tomatoes (₦ /50 kg)	Onions (₦ /50 kg)
Returns	3669.92	8252.09
Total revenue		
Cost		
Purchase cost	154.55	448.90
Transport cost	8.34	13.19
Loading cost	2.08	3.15
Off-loading cost	1.74	2.49
Storage cost	0	6.84
Market levy	3.90	4.33
Costs of basket	23.14	10.69
Local government levy	5.38	4.88
Total variable cost	199.13	494.47
Gross margin: A-B	3,470.79	7,757.62

Source: Field survey (2019).

Table 3. Estimation of pricing efficiency of tomato and onion marketers.

Items	Amount of tomatoes (₦ /50 kg)	Amount of onions (₦ /50 kg)
A. Buying price	155.32	449.48
B. Selling Price	282.13	731.98
C. Marketing Cost	44.58	45.57
D. Marketing Margin B-A	126.81	282.50
E. Net Margin: D-C	82.23	236.93
F. Marketing Efficiency E/C	1.84	5.19

Source: Field survey (2019)

tomato and onions marketers in the area was 1.84 and 5.19 respectively. This implies that for every ₦1 invested in tomato marketing, ₦1.84 was obtained by the marketers while for every ₦1 invested in onion marketing, ₦5.19 was obtained by the marketers. Since the values were greater than one, it implies that tomato and onions market in the area were efficient. This agrees with Obasi and Emenam (2014) who revealed an efficient market for onion in Abia State, Nigeria.

Constraints to the marketing of tomato and onions

Various constraints limiting the marketing of tomato and onions were identified by the respondents. These constraints were ranked on a Likert type scale and presented in Table 4. It showed that all the constraints significantly affect the marketing of tomato and onions in the study area. Although the highly ranked ones were storage facilities (3.71), transportation 3.68 capital (3.67), credit facilities (3.59), lack of insurance (3.37) and tax levies (3.26). Capital is required to purchase the improved storage facilities which are usually expensive. Since the capital available to these marketers are inadequate, they tend to conduct their marketing activities without these storage facilities and thus, leading to deterioration of their commodity. This support the work of Oladejo and Oladiran (2014) which reveals that rapid deterioration in tomato quality due to the challenge of finance to obtain the required storage facilities in Oyo State Nigeria. Also the findings support the work of Oghogho *et al*. (2014), and Izekor and Abiola (2011) who found that poor transportation are the major constraints to post-harvest losses in green vegetables marketing.

CONCLUSION

The findings of the study revealed that tomato and onion marketers in the area were mostly female, married with large household size within the active age, well experienced, educated and high income earners. Majority of the marketers were producers who sourced their onion and tomato from rural marketers and sold directly to the customers. Tomato and onion marketing in the area was profitable with the purchase, accounting for the highest marketing cost. Storage facility problem constituted the greatest challenge faced by the onion and tomato

Table 4. Constraints to the marketing of onion and tomato in Benue State (n = 300).

Constraints	Mean	S.D
Storage facilities	3.71	0.48
Transportation	3.68	0.51
Capital	3.67	0.59
Credit facilities	3.59	0.59
Lack of insurance	3.37	0.84
Tax levies	3.26	0.85
Seasonality	2.92	1.15
Robbery	2.89	1.09
Debt	2.74	1.12

Source: Field survey data (2019). Serious constraints (mean > 2.5)

marketers in the area.

RECOMMENDATIONS

Based on the findings, the following recommendations were made:

i. Efforts should be made to eliminate the constraints to tomato and onion marketing in the study area by improving on 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 points of consumption; and

ii. The marketers should be encouraged to form co-operative societies to promote bulk purchase and transportation of tomato and onion in the area. This will reduce the high cost of transportation involved in the marketing of those commodities as well as enable them achieve the benefits from economy of scale.

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