

Economic Analysis of Pepper Marketing in Oyo State, Nigeria

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ABSTRACT

This paper focused on the economic analysis of pepper marketing in Oyo state, Nigeria. Specifically, the paper identified the distribution channels and constraints to pepper marketing, and also analysed the profitability of pepper marketing and its determinants in Bodija and Sasa Markets in Oyo state. Data were collected from one hundred and fifty six pepper marketers; seventy-eight wholesalers and retailers each. Descriptive Statistics, Profit Margin and Multiple Regression were used for data analysis. Results show that 33.4% of pepper marketers got pepper fruits directly from farm gates, while 66.6% got pepper fruits through other channels such as agents. The profit margin for wholesalers (16.48% and 11.83%) was higher than retailers (10.86% and 11.78%) in Bodija and Sasa markets respectively. Majority (81.4%) of the pepper marketers identified insufficient working capital as the most serious constraint to pepper marketing. Years of experience in pepper marketing, start-up capital, waste disposal and security of point of sales had significant positive influence, while quantity of pepper supplied had significant negative influence on the profit realized from pepper marketing. Pepper business is profitable, and as such, if properly harnessed, many unemployed youth can be removed from the street.

Key words: pepper marketing, profitability, distribution channels, marketing constraints

INTRODUCTION

Pepper is an important agricultural crop, not only because of its economic importance, but also due to the nutritional and medicinal value of its fruits, as well as being an excellent source of natural colours and antioxidant compounds (Howard *et al.*, 2000). Pepper is one of the most varied and widely used foods in the world (Dipeolu and Akinbode, 2008). It is the world's second important fruit vegetable, ranking after tomatoes, and it is the most produced type of spice flavouring and colouring for food while providing essential vitamins and minerals (Bosland and Votava, 2000).

According to Bosland and Votava (2000), pepper production has increased worldwide and this could be ascribed partly to its high nutritional value. As explained by Grubben and Tahir (2004), Food and Agriculture Organization (FAO) statistics estimated world production of *Capsicum* peppers in 2001 at 21.3 million tonnes from a harvested area of 1.6 million ha (that is, an average yield of 13.4t/ha). Comparatively, yield in the developing countries is about 10 – 30% of that in developed countries (Grubben and Tahir, 2004). However, Nigeria is known to be one of the major producers of pepper in the world, accounting for about 50% of the African production, and the major area of production is Northern Nigeria (Business day, 2007).

Pepper is produced in larger quantities in the northern part of the country and the North supplies the bulk of the pepper needs of the southern parts whose production is still at small scale. Despite increasing cultivation of pepper in the south-western part of the country, seasonal price fluctuations and scarcity is still common (Dipeolu and Akinbode, 2008). High potential pepper producing areas of Nigeria such as Kaduna, Kano, Jigawa, Katsina, Sokoto, Plateau and Bauchi States (most of which also lie within the derived savannah zone) produce enough pepper to meet the needs of the people in the deficit areas such as Southwest, that is, Oyo, Ondo, Osun, Ogun, Ekiti and Lagos States (Adigun, 2001).

In a country like Nigeria where the average diet is dominated by carbohydrate foods, pepper is an essential source of vitamins and minerals. In the light of the essential needs for pepper in human life, emphasis has to be laid on increasing the production level and improving the marketing mechanism. However, there are two basic problems with pepper in Nigeria; those that prevent the production process and those that prevent marketing process. Pepper has the disadvantage of being highly perishable. This is more pronounced in developing countries like Nigeria where inadequate storage and processing facilities pose a threat to agricultural produce, which eventually result in incredible losses because of

inadequate preservative measures (Sanusi and Ayinde, 2013).

The distribution of pepper over time in Nigeria has helped in facilitating its availability even in those areas that peppers are not heavily produced. Some of the major distribution channels employed by pepper marketers in Nigeria generally follow the normal chain of distributive trade from the producers to the wholesalers, passing through the retailers and lastly to the final consumers. According to Udegbe *et al.* (2012), marketing of agricultural produce such as pepper consists primarily of moving the produce from production sites to points of final consumption. In this regard, the market performs exchange functions as well as physical and facilitating functions. The exchange function involves buying, selling and pricing, while transportation, product transformation and storage are physical functions. Financing, risk-bearing and marketing information facilitate marketing.

Udegbe *et al.* (2012) further explained that the participants in pepper distribution in Nigeria include the producer (farmer), the assembler, the wholesaler, the retailer, and finally the consumer. More often than not, the farmer sells right at the farm gate directly to the consumers but generally to the wholesaler who sells in distant markets. Most pepper that serve Lagos, for example, come from far distances such as Lokoja, Zaria, Makurdi, Kano and Kaduna. Basically, distribution of pepper is constrained by its perishability, its seasonality and high transport cost in conveying the produce from the point of production to the market. The chain of distribution could hinder efficiency in pepper marketing, especially in a situation where there exist trade unions.

It is against this background that this study carried out an economic analysis of pepper marketing in Oyo state, Nigeria. Specifically, the study examined the distribution channels of pepper, determined the profitability of pepper marketing, identified the constraints, and analysed the determinants of profitability among the pepper marketers in the state.

METHODOLOGY

The study was carried out in Oyo state. Oyo state was one of the three states carved out of the former western state of Nigeria in 1976. It is one of the six states that make up the Southwest geopolitical zone of Nigeria. It shares international boundary with the republic of Benin to the West, interstate boundaries with Osun state to the East, Kwara state to the North and Ogun state to the South. It approximately has a land area of 28,454 kilometres, with coordinates 8°00'N, 4°00'E/8.000°N, 4.000°E. It has an estimated total population of 6,617,720 with a population

density of 211 people per square kilometer (National Population Commissions, 2007).

The climate is equatorial, notably with dry and raining seasons with relatively high humidity. The raining season starts from April and ends in October while the dry season lasts from November to March. The average daily temperature ranges between 25°C and 35°C throughout the year. The vegetation pattern is that of rain forest in the south and guinea savannah in the north. The people are predominantly farmers, most of who engage in cultivation of arable crops such as cassava, yam, maize, rice, okra, vegetables and pepper, while some engage in livestock production such as piggery, poultry and fish farming. Others are involved in artisan works and trading.

Primary data were used for the study. These were obtained through administering of questionnaire to pepper marketers in the study area. The questionnaire contained pertinent questions on distribution channels, marketing costs, constraints to pepper marketing and some socio-economic characteristics of the marketers. One hundred and fifty-six pepper marketers were selected in the study area using multistage sampling procedure. The first stage involved a purposive selection of two Local Government Areas (Akinyele, and Ibadan North) given their prominence in pepper marketing in the state; this is based on the information gathered from pilot survey carried out. The second stage was the selection of Sasa and Bodija markets in Akinyele and Ibadan North Local Government Areas respectively. This is because these markets host pepper marketers from all the communities in these local governments on the market days, thus serving as the central points for the pepper marketers in these local governments. This was also found out from the pilot survey carried out. The last stage was the random selection of 39 wholesale and 39 retail pepper marketers, making a total of 78 pepper marketers from each market.

The socio-economic characteristics of the respondents, distribution channels of pepper and constraints to pepper marketing were analyzed using descriptive statistics such as frequency counts, percentages and mean, and the results were presented in frequency distribution tables. Profit margin analysis was used to determine the profitability of pepper marketing while linear (multiple) regression model was used to analyse the determinants of profitability of pepper in the markets.

The profit margin was calculated out and expressed as percentage of total sales (revenue).

Mathematically:

(a) Net Profit Margin = Average Revenue – Average Total cost

(b) Profit Margin Ratio = $\frac{\text{Net Profit Margin}}{\text{Total sales}} \times 100\%$

To analyse the determinants of profitability, the profit (Pi) of pepper marketers was expressed as a function of certain explanatory variables, X_i , on which multiple regression was carried out.

$$P_i = f(X_i, U_i) \dots (1)$$

$$X_i = X_1, X_2, X_3, X_4, \dots, X_{11} \dots (2)$$

The explanatory variables X_i , in addition to the linear property, also summarize a set of marketing, and socio-economics characteristics.

Different functional forms (Linear function, Cobb Douglas, Semi-log and Exponential function) were tried out, but linear functional form was selected because it gave the best fit.

$$P = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_{11} X_{11} + U_i \dots (3)$$

Where

P = Profit made in pepper marketing in Naira

X_1 = Years of experience in pepper marketing

X_2 = Start-up capital in Naira

X_3 = Waste disposal (Proper waste disposal = 1, No/poor waste disposal = 0)

X_4 = Storage (Available = 1, Not available = 0)

X_5 = Sex (Male = 1, Female = 0)

X_6 = Years of education

X_7 = Marital status (Married = 1, Otherwise = 0)

X_8 = Household size (Number of persons)

X_9 = Nature of marketing activities (Full time = 1, Part-time = 0)

X_{10} = Quantity of pepper supplied in Kg

X_{11} = Security of the Point of sales (secured = 1, Not secured = 0)

U_i = Error term.

RESULTS AND DISCUSSIONS

Distribution Channels of Pepper Reflecting the Source of Supply

Table 1 shows that 33.4% of pepper marketers (retailers) got pepper fruits directly from the farm gate (producers) and 23.7% from other sources, thereby breaking the position of the wholesalers in the marketing channel to enhance the profit of the retailers. On the other hand, 25.0% of the marketers got their supplies from agents while only 14.1% were distributed by wholesalers.

From the results, the distribution channels obtainable in the markets include:

Producers → Retailers → Consumers

Producers → Agents → Retailers → Consumers

Producers → Wholesalers → Retailers → Consumers

Producers → Consumers

Producers → Other Sources → Retailers → Consumers

Agents and wholesalers were more involved in distribution of pepper in Sasa market (30.8% and 15.4% of marketers got pepper from them respectively) than Bodija

market (19.2% and 12.8% of marketers got pepper from them respectively).

Constraints to Pepper Marketing in Bodija and Sasa Markets

Table 2 shows the constraints to pepper marketing in the study area. The pepper marketers (81.4%) identified insufficient working capital as the most serious constraint. This is due to the fact that the marketers did not have access to formal credit. The second most important constraint to pepper marketing was the problem of fixing a standard price on the product; 77.6% of the marketers agreed to this. Price is determined by individuals (bargaining ability of buyer/seller) and this affects profitability.

The mode of transportation refers to the media for conveying pepper from the farm to the market or other points of sale. The available media for transporting pepper to Sasa and Bodija markets include buses, cars, lorries, motorcycles, and in recent times, tricycle (locally referred to as *Keke NAPEP*). Based on this understanding, 76.3% of the marketers agreed that poor mode of transportation was a serious constraint for them, making the constraint to rank third.

According to the marketers, lack of proper waste disposal affects their activities. This reduces economic activities in the markets. This constraint was identified by 71.8% of the marketers, therefore ranked fourth. Although it was said that government provided iron drums for waste disposal before but they are no longer available in the markets. Therefore, people dispose of waste in any way possible. Also, as shown in the results, 61.5% of the marketers indicated that low level of government support was a serious constraint to them. This is as a result of the difficulties they faced in accessing loans provided by the government.

Lack of storage facilities was identified by 60.3% of the respondents and it ranked sixth among the constraints. Normally, after purchase, the products are sold off within few days. Therefore, some of the marketers did not see any need for storage as pepper is highly perishable. However, this might reduce profit since it might be impossible to sell all purchased produce at one market trip, especially when there is glut. Adequate storage facilities are needed to reduce loss of agricultural produce, most especially fruits and vegetables.

Insufficient supply of pepper ranked seventh (56.4%), reaffirming the fact that insufficient supply of pepper during the off-peak season remains one of the constraints in pepper marketing. Also, about half of the respondents (55.1%, 53.2%, and 51.3%) perceived long distance to the market, seasonality of pepper, and having temporary shop

stand as constraints to pepper marketing, while less than half (44.2%, 41.7%, and 31.4%) perceived perishable nature of pepper, high tax charges, and limited demand for pepper as constraints respectively.

Due to advancement in technology, pepper is made available all year round through irrigation channels but not as much as during its peak period. The high moisture content of pepper accounts for considerable amount of post-harvest losses during the course of transporting

pepper to the market. The only available means by which pepper farmers in Nigeria transport the product to the market is by road. Therefore, the nature of pepper as perishable crop accounts for losses in the business. Limited demand for pepper was ranked the least among the constraints faced by pepper marketers. Although pepper is not avoidable by the people, demand becomes low, especially in the peak season in relation to possible glut in the market.

Table 1: Source of supply

Source of Supply	Sasa Market		Bodija Market		All	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Direct from farm gate	27	34.6	25	32.1	52	33.4
Personal Farm	1	1.3	5	6.4	6	3.8
Agent	24	30.8	15	19.2	39	25
Wholesalers	12	15.4	10	12.8	22	14.1
Others	14	17.9	23	29.5	37	23.7
Total	78	100	78	100	156	100

Source: Field Survey, 2015

Table 2: Constraints to pepper marketing in Bodija and Sasa

Constraints	Frequency	Percentage	Rank
Insufficient working capital	127	81.4	1
Inadequate price control (irregular prices)	121	77.6	2
Poor mode of transportation	119	76.3	3
Inadequate waste disposal	112	71.8	4
Low level of government support	96	61.5	5
Inadequate storage facilities	94	60.3	6
Inadequate supply of pepper	88	56.4	7
Long distance to market	86	55.1	8
Seasonality of pepper	83	53.2	9
Temporary shop stand	80	51.3	10
Perishable nature of pepper	69	44.2	11
High tax charges	65	41.7	12
Limited demand for pepper	49	31.4	13

Source: Data Analysis, 2015

Table 3: Revenue, costs and profit margin of pepper marketers at Sasa and Bodija markets

Market	Average Revenue (₦)/5 days	Average Total Cost (₦)/5 days	Profit margin	% Profit margin
Sasa				
Wholesalers	929,991	819,969	110,022	11.83
Retailers	25,890	22,840	3,050	11.78
Bodija				
Wholesalers	152,194	127,091	25,083	16.48
Retailers	30,056	26,792	3,264	10.86

Source: Data Analysis, 2015

Revenue, Costs and Profit Margin for Pepper Marketers

Table 3 presents information on Average Total Revenue and Average Total Cost for wholesalers and retailers in each market. They were used to compute the profit margin and percentage profit margin in Sasa and Bodija markets.

Sasa Market

Profit margin

Wholesalers: Average Revenue – Average Total cost = Profit

$$929,991 - 819,969 = \text{₦} 110,022 \text{ per 5 days}$$

Retailers: Average Revenue – Average Total cost = Profit

$$25,890 - 22,840 = \text{₦} 3,050 \text{ per 5 days}$$

Profitability (percentage profit margin)

$$\text{Wholesalers} = \frac{929,991 - 819,969}{929,991} \times 100\% = \frac{110,022}{929,991} \times 100 = 11.83\%$$

$$\text{Retailers} = \frac{25,890 - 22,840.81}{25,890} \times 100\% = \frac{3,049}{25,890} \times 100 = 11.78\%$$

Bodija Market

Profit margin

Wholesalers: Average Revenue – Average Total cost = Profit

$$152,174 - 127,091 = \text{₦} 25,083 \text{ per 5 days}$$

Retailers : Average Revenue – Average Total cost = Profit

$$30,056 - 26,792 = \text{₦} 3,264 \text{ per 5 days}$$

Profitability (percentage profit margin)

$$\text{Retailers} = \frac{30,056.73 - 26,792.28}{30,056.73} \times 100\% = \frac{3,264.45}{30,056.73} \times 100 = 10.86\%$$

$$\text{Wholesalers} = \frac{152,174 - 127,091}{152,174} \times 100\% = \frac{25,083}{152,174} \times 100 = 16.48\%$$

Results show a higher percentage profit margin for wholesalers than retailers in both markets. There was just 0.05% difference in the percentage profit margin between the wholesalers and the retailers in Sasa market but a wider difference of 5.62% between them in Bodija market. This could imply that those who deal in wholesale business make more profit than their counterparts who are retailers.

Determinants of Profit on Pepper Marketing

The multiple regression results on the variables that influence profits made from pepper marketing are

presented in Table 4. Results show that experience in pepper marketing had statistically significant positive effect on profit at 5 percent. This implies that as experience in pepper marketing increases by one year, profit increases by ₦868.067. Increasing wealth of experience in the business is a positive influence for profit making. Also, start-up capital had statistically significant positive relationship with profit at 5 percent. A naira increase in start-up capital in pepper business gives ₦0.80 increase in profit. This shows that the higher the start-up capital, the higher the profit potential of the business.

There was a statistically significant positive relationship between waste disposal and profitability at 1 percent. Table 4 shows higher profit (₦155.74) for pepper marketers with proper waste disposal. This implies that adequate waste disposal plays significant role in pepper business, which could be in form of motivation for buyers for patronage.

The Quantity of pepper supplied had a statistically significant negative relationship with profitability at 5 percent. Results show that every kilogram increase in the supply of pepper in the market is accompanied by ₦147.35 reduction in the profit realized by the pepper marketers. This agrees with the law of supply and demand which explains fall in price for increase in supply of goods, thus resulting to reduction in profit realised. Also, security of point of sales had a positive sign and was statistically significant at 1 percent level. Results show an increase of ₦168.27 in profit for pepper marketers with secured point of sales.

CONCLUSION

Pepper marketing is shown to be profitable to wholesalers and retailers in both markets studied, but more profitable to the wholesalers than retailers considering the percentage profit margin. However, the channels of distribution of pepper and profitability of pepper marketing in both markets can be improved if some of the problems facing the marketers are resolved. In order to achieve this, the following are suggested:

- 1) Pepper marketing business is profitable with regular income, and as such, if properly harnessed, many unemployed youth can be removed from the street.
- 2) Proper and effective waste disposal methods will enhance better marketing and profitability.
- 3) Credit facilities should be available for the pepper sellers to increase their capital base, through cooperative, local lenders, bank, *esusu* (contribution) and credit purchase.

Table 4: Determinants of profit in pepper marketing using linear regression

Variables	Coefficient	t-value	Standard error
Years of Experience in pepper marketing	868.067	2.842**	657.307
Startup Capital	0.805	2.347**	0.046
Waste Disposal	155.735	3.526***	43.981
Storage	900.217	-1.511	6016.027
Sex	178.862	1.55	10999.27
Years of Education	254.741	0.8	3218.426
Marital Status	-154.087	-1.349	9899.249
Household Size	-210.955	-1.075	2521.819
Occupation	147.345	-0.055	2679.004
Quantity Supplied	-634.601	-2.050**	3090.049
Security of Point of Sales	168.27	3.083***	54.58
$R^2 = 0.956$ (95.6%)			
Adj $R^2 = 0.951$ (95.1%)			

Source: Field Survey, 2015; *** significance at 1%, ** at 5%

4) Government should formulate policies and initiate programmes and projects, or the existing ones should be harnessed to increase the production and facilitate improved distribution of pepper especially at lean season so as to aid pepper consumption and survival to marketers which will enhance profit.

5) Based on the findings, funding (capital) is a major problem to pepper marketers, it is recommended that pepper marketers should strengthen themselves by forming cooperative groups which could grant members timely loans at very low interest rates. Such groups could also see to the maintenance of market and supply of necessary items like providing generators to supply power to refrigerators and cold rooms where members could store some of the pepper that cannot be sold per period.

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