Economics of Red Pepper Marketing in Adamawa State, Nigeria

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Abstract

This study examined the Economics of red pepper marketing in Adamawa State, Nigeria. The study was based on primary data collected with the aid of questionnaire administered to one hundred and four respondents using purposive and simple random sampling procedure. The tools of analysis were Descriptive and Inferential statistics, to identify the problems of marketing while the inferential statistics was employed to analyze the determinants of profit using the regression analysis. The study revealed that the exponential function of the regression analysis gave the best fit with R^2 of 0.92 and was significant at 1% which shows that about 92% variation in the profit of red pepper marketing were caused by variations in the six assumed explanatory variables. Some of the challenges experienced by red pepper marketers in the study area were inconsistence government support, capital, inadequate market infrastructure, seasonality and storage facility as major problems in the study area. it was recommended that Government and non-Governmental organisations (NGOs) should provide adequate market infrastructure and storage facilities at subsidize rates, enhance pepper producer's and marketer's bargaining power through cooperatives and to improve their technical knowledge and skill in marketing through training, so that the marketing system will become more responsive to consumer's demand.

Keywords: Economics, Red Pepper, Descriptive and Inferential

Introduction

Red pepper is one of the major spice used in food flavoring and its marketing have been the major source of livelihood to many Nigerians. Red pepper is believed to have originated in Central and South America. Peru and Mexico might have been the second centers of origin, after which it spread into the New World Tropics before its subsequent introduction into Asia and Africa in 1493 (Bosland and Votava, 2000).

Over 48% of the world pepper is produced in Asia, China being the leading country. However, India is the major exporter of dry chilli peppers, followed by China, and the major importing countries are the U.S.A. and Germany (Berke, 2002). 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). 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 (e.g. Southwest i.e., Ogun, Oyo,

Ondo, Osun, Ekiti and Lagos States). Although, pepper is widely cultivated throughout Nigeria, yields obtained by peasant farmers are often very low compared with the estimated yield of 15t/ha obtained in Western Europe and despite the ecological advantage, red pepper marketing in the country is very much limited (Adigun, 2001). Pepper is an important agricultural crop because of its economic importance, nutritional and medicinal value of its fruits as well as being an excellent source of natural color and antioxidant compounds (Howard *et al.*, 2000). Consumption of pepper accounts for about 20% of the average vegetable consumption per person per day in Nigeria (Erinle, 1989). It is used extensively in food flavoring in the daily diet of over 120 million Nigerians irrespective of their socio-economic status. It is used in the preparation of soup and stew, which are among the major essential complements of staple foods based on cereals and root crops and also forms remedies for toothache and sore throat (Leung and Foster, 2000).

In addition to having major role in Nigerians daily dish it also plays an important role in the national economy. It is an important cash crop today, as its

exportation in Nigeria has once been reported to be a lucrative business (Idowu-agida *et al.*, 2010). it is a crop of high value in both domestic and export markets. Since it is a commercial and industrial crop, it generates employment to urban and rural Nigerians.

This paper is expected to enhance pepper marketing so that the marketing system will become more responsive to consumer's demand in the study area by identifying the problems associated with red pepper marketing and to proffered possible solutions.

This paper aimed at evaluating the determinants of profit in Red pepper marketing in Adamawa State, Nigeria. The specific objectives are to evaluate the determinants of profit among Red pepper marketers in the study area and to identify the problems of Red pepper marketing.

Materials and Methods
Description of the Study Area
The study area is Adamawa State and it is located at the North-Eastern part of Nigeria. It lies between latitude 7 and 11^0 N and between Longitude 11^0 and 14^0 E. It shares boundary with Taraba State in the south and west, Gombe State in its North-west and Borno state to the North. The State has an international boundary with the Cameroon Republic along its eastern side. It has a land area of about 38,741 km^2 (Adebayo, 1999). The state is divided into 21 local government areas.

Adamawa State has a tropical wet and dry climate. Dry season lasts for a minimum of five months (November-March) while the wet season spans April to October. Mean annual rainfall in the state ranges from 700mm in the North-west, to 1600mm in the extreme southern part of the state (Adebayo, 1999).

The state is naturally divided into two ecological zones; the guinea and Sudan savannah zones. In general, the distribution of vegetation reflects the combined control of rainfall, topography and to a lesser extent, that of soils. Agriculture is the mainstay of about 80% of the inhabitants of the State (Adebayo, 1997). The ecological condition of the state permits cultivation of root crops, cereals, vegetables and rearing of livestock in large numbers as well as trading.

Methods of Data Collection
Primary data were used for the study. These were obtained through administration of questionnaire to pepper traders in the study area. The questionnaire contained pertinent questions which focus on socio-economic characteristics, source of finance as well as sales and expenditure of marketing.

Sample size and Sampling Technique
One hundred and four (104) pepper marketers in the study area were selected using purposive and simple random sampling procedure. Using the four (4) Agricultural zones zoned by the Adamawa State Agricultural Development program (AD. ADP 2005) Six (6) local governments were purposively selected from the four zones given their prominence in pepper marketing; Six (6) major markets from each selected local government areas (LGA) was also purposively selected based on market arrival. Respondents from each market were proportionately selected using Cocran (1997) formula as shown in Table 1.

$$nh = \frac{Nh \ X \ n}{N}$$

Where:
nh = number of respondent from sampled market
Nh = number of marketers in each of the sampled market
N = total number of marketers in all sampled markets
n = total number of questionnaire to be distributed

Simple random sampling procedure was employed for the selection of the respondents in each market. Thus, the total of 104 marketers of red pepper was observed and used as a sample size for the study.

Table 1: Proportionate Selection of The Respondents.

S/N	Markets	Number of Marketers in each of the sampled Market	Number of Respondents from each Market
1	Mubi Market	80	26
2	Loko Market	70	20
3	Jimeta Modern Market	85	27
4	Numan Main Market	50	14
5	Ganye Market	40	11
6	Fofure Market	30	9
	Total	**355**	**104**

Analytical Tools/Techniques
The following analytical tools were employed in the analysis.
(i)   Descriptive statistics such as frequencies and percentages was used to identify the problems of red pepper marketers in the study area.
(ii)   Inferential statistics was used to analyze the determinants of profit margin. Four functional forms were used to fit the data generated in order to determine the equation with best fit, the explanatory variables used in the model are: Age of marketers, Years of marketing experience, marital status, Startup capital, Cost of labor and Transportation cost. The functional forms and their general formulae are presented below:

i. linear function: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + U_i$
ii. Double logarithm function: $l_n Y = \beta_0 + \beta_1 l_n X_1 + \beta_2 l_n X_2 + \beta_3 l_n X_3 + \beta_4 l_n X_4 + \beta_5 l_n X_5 + \beta_6 l_n X_6 + U$
iii. Exponential function: $l_n Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + U_i$
iv. Semi logarithm function: $Y = \beta_0 + \beta_1 l_n X_1 + \beta_2 l_n X_2 + \beta_3 l_n X_3 + \beta_4 l_n X_4 + \beta_5 l_n X_5 + \beta_6 l_n X_6 + U_i$

where
Y= profit
β_0 = Intercept
β_1 = Coefficient of Age
β_2 = Coefficient of Marketing Experience
β_3 = Coefficient of Marital Status
β_4 = Coefficient of Start-up Capital
β_5 = Coefficient of Labour
β_6 = Coefficient of Transport
Profit = $F(x_1, x_2, x_3, x_4, x_5, x_6)$
Where; x_1 = Age of marketers (years)
x_2 = Years of marketing experience (years)
x_3 = Marital status (1= married, 0- otherwise)
x_4 = Startup capital (₦)
x_5 = Cost of labor (₦)
x_6 = Transportation cost (₦) and
U_i = Error term.

Results and Discussion
Problems of Red Pepper Marketing
Table 2 indicates some of the challenges faced by red pepper marketers as: financial problems, as 12.11% of them complained of inadequate capital as their major problem, since most of them are rural dwellers without capital to invest in the business. This problem is compounded by the fact that they are not getting financial assistance from the financial institutions in the form of loans as most of them use their personal saving for initial capital outlay.

Storage facility Storage facilities help for smooth and continuous flow of products marketed and create time utilities. Farmers harvest pepper in two forms, when green and dried for different purposes. According to the survey, **9.9**% of the respondents complain of lack of modern storage facility which is attributed to the perishability nature of the crop, in which non-disposal of it on time could lead to spoilage, even though traders dry red pepper on the floor which is liable to dust and other foreign matters. In addition to this, some traders dry red pepper at the top of their house that leads to over drying and decrease its pungency. This agrees with the findings of Usman *et al.* (2013) who also reported poor storage and processing facilities course excessive losses of tomato at storage in Adamawa State.

Road and transport
The availability of well-functioning transport network is very important because it creates place utilities of the product. It there by allows farmers in surplus areas to profit from better prices from other markets and also consumers in deficit areas benefit from lower prices by transporting from surplus areas. It can be deduced from the table that marketers in the study area are not enjoying such benefit as 7.34% of them complain of bad road networks. This implies that transportation cost is high thereby reducing the profit of the marketers.

Theft is another problem identified in the study area as 3.80% of the sample traders identified that the product may remain on the ground for some time before sailing and there are no secured structures for saving thereby making it conducive to thieves. Some of traders are being robbed at the time of their journey because they transport their pepper at night. About 6.77% of the traders responded that farmers reluctant to sell their produce on time due to lack of real price information, the low-price offer, and their low quality of pepper fetched low price.

The table revealed that 9.50% of traders complain that the government didn't support, and didn't focus on pepper trade by building storage facility and making credit facility accessible to traders at a lower interest rate with less bureaucracy. They also complain that they could not get regular buyers and could not sell their product to larger processing organization as there are no such in the state and even if is available they

have to register for value added tax (VAT). This according to them is because pepper trade is seasonal and operated only few months.

About 5.58% of them face supply shortage due to pepper storage by farmers by expecting high price, but instead exposing it to damage in the store. According to the traders, lower quality and large number of buyers in some specific markets are also the cause of supply shortage.

Table 2: Problems of Red Pepper Marketing in Adamawa State

	Frequency	Percentage
Inadequate market infrastructure	97	11.52
Inadequate capital	102	12.11
Bad road networks	62	7.34
Perishability	87	10.33
Shortage of supply	47	5.58
Lack of storage facilities	66	7.83
Theft	32	3.80
Poor market structure and communication	11	1.30
Administration measure and multiple taxation	35	4.16
Inadequate government support	80	9.50
Too much competition with license traders	69	8.19
Farmers reluctant to sale due to low price	57	
Seasonality	97	11.52
Total	**842***	**100**

* 842 multiple responses.
Source: Field Survey, 2018.

Regression analysis result
The results of regression analysis on determinants of profit of red pepper marketers were obtainable in table 3 and 4 respectively. the exponential function gave the best fit with R^2 of 0.92 and was significant at 1% The coefficient of multiple determination (R^2) was 0.92 which shows that about 92% variation in the profit of red pepper marketing were caused by variations in the six assumed explanatory variables. The coefficient of the variables included in the model were statistically significant at 1%, 5% and 10% respectively and the variables are Age (x_1) years of marketing experience (x_2), marital status (x_3), startup capital (x_4), labor cost (x_5) and transportation cost (x_6).

Age:
The coefficient of this variable was significant at 5% (P<0.05) and carries a negative sign; indicating that as the marketer grows older, the lower their profit. This is attributed to the fact that old people appears to be sluggish and lack the strength to carry out some of the marketing functions. This implies

that old marketers pay for the services of others to carry out some of the functions they could not be able to do there by reducing their profitability as high cost of labor is sustained in their marketing activities.

Marital Status:
The coefficient of this variable was significant at 10% and carries a positive sign which implies that married people remain more focus in maintaining customer's relationship thereby making more profit than those who are not married. This finding distresses Adewuyi and Adekunle (2015) that marriage has no effect on the profitability of the marketers as the variable was not significant in their studies.

Marketing Experience:
The coefficient of this variable was significant at 5% and carries a positive sign indicating that the longer the years of experience of the marketer in sales of red pepper the higher their profit margin. This agrees with the apriori expectation in that

longer experience permits the marketers to acquire methods of preserving fresh pepper, thereby reducing the storage loss due to damage and consequently increases their profit level. This is in consonance with Sanusi and Ayinde (2013) that experience enhances efficiency in marketing. This implies that marketers who possess a substantial wealth of experience tends to make more profit in the study area.

Startup Capital:

The coefficient of this variable was significant at 1% and carries a positive sign which is an indication that the higher the marketing cost, the higher the profit margin of the marketer. This is because of the spatial differential in the location of production and consumption as the produce need to be effectively distributed to reach the target markets and consumers as postulated by Adelemo, (2009) that within the socio-economic landscape, there exist places of surpluses on one hand and places of deficit on the other. This spatial differentiation generates a system of marketing along the landscape. This implies that if high capital is acquired by the marketer, the more the profit he will make.

Labor Cost:

The coefficient of this variable was significant at 1 and carries a positive sign, indicating that the higher the labor cost, the higher the profit margin of the markets. This disagrees with the apriori expectation in that if less labor cost is incurred by the marketers, the more the profit that will accrue to the marketer. This disagrees with Adewuyi and Adekunle (2015) as the coefficient of the variable was significant at $p<0.01$ in their studies and carries negative sign indicating that the lower the labor cost, the higher the profit margin. However, this could be because most of the marketers use family labor without much expenses.

Transportation Cost:

The coefficient of this variable was significant at 10% and carries a negative sign indicating that the lower the transportation cost, the higher the profit margin of the marketer this is due to the fact that bad road network have been the major cause of transportation cost as identified by Raphiel and Eniola (2015), that transportation is one of the cause of marketing cost of red pepper. This implies that if less transportation cost is incurred by the marketer, the more profit will accrue to him.

Table 3: Summary of Regression of Determinant of Profit of Red Pepper Marketers

Functional Forms	Constant	x_1	x_2	x_3	x_4	x_5	x_6	R^2	Adjusted R^2	F
Linear	-0.59	-1.34	2.83	0.85	5.39	0.10	0.44	0.5371	0.5085	18.79*
	(0.558) ***	(0.184)***	(0.006)**	(0.398)***	(0.000)*	(0.919)***	(0.661)***			
Semi Log	-3.36	-0.33	2.61	0.32	2.61	0.49	0.48	0.4123	0.3760	11.34*
	(0.001)**	(0.743)***	(0.011)**	(0.749)***	(0.010)**	(0.626)***	(0.636)***			
[+]Exponential	47.77	-2.69	2.83	1.25	4.36	4.93	-1.16	0.8477	0.8381	89.02*
	(0.000)*	(0.009)**	(0.006)**	(0.213)***	(0.000)*	(0.000)*	(0.249)***			
Double Log (Cob Doglas)	4.75	0.06	3.66	0.30	2.18	7.89	0.08	0.9209	0.9160	186.31*
	(0.000)*	(0.952)***	(0.000)*	(0.765)***	(0.032)**	(0.000)*	(0.938)***			

*, **, *** referred to significant at 1, 5 and 10% respectively.

+ = Selected function

Source: Surveyed Data, 2018.

Table 4: Regression Result of the Determinant of Profit of Red Pepper Marketers (Selected function)

Independent Variable	Coefficient	Significant
Constant	47.77	0.000*
Age (x_1)	-2.69	0.009**
Year of Marketing Experience (x_2)	2.83	0.006**
Marital Status (x_3)	1.25	0.213***
Startup Capital (x_4)	4.36	0.000*
Cost incurred on Labor (x_5)	4.93	0.000*
Cost incurred on transportation (x_6)	-1.16	0.249***
R^2	0.8477	
Adjusted R^2	0.8381	
F-value	89.02	

*, **, *** referred to significant at 1, 5 and 10% respectively.
Source: Surveyed Data, 2018.

Conclusion and Recommendation

It is obvious that the various constraints being faced by the marketers affects their profitability and inability to enhance pepper marketing so that the marketing system will become more responsive to consumer's demand in the study area and there is need to address the issues of capital among marketers for sustainable livelihood. There is need to address the issues of the determinants of profit among marketers for sustainable livelihood. Therefore, policy issues should aim at encouraging red pepper marketers to stay in the business as experience enhances efficiency. There is need for market intermediaries to improve their technical knowledge and skill in marketing through training, so that the marketing system will become more responsive to consumer's demand. Hence, this becomes a reality when extension education programs are introduced to encourage marketing and also bring about improvement in their living standards.

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