



Analysis of Factors Influencing the Price of Paddy Rice in Benue State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author OOM designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors TI and APA managed the analyses of the study. Author OOM managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The study analyzed the factors influencing the price of paddy rice in Benue State, Nigeria. Data were collected from 113 rice farmers' marketers using multi-stage sampling technique. Data were analyzed using descriptive statistics and multi-regression model. The study revealed that respondents were in their active age, mostly males (65.5%), married (69.0%) formal education (79.6%), average marketing experience of 9 years and 10 members per household. Quality type of paddy rice, season and transport cost were the important and significant variables that influence the price of paddy rice in the study area. These were significant at 5%, 5% and 1% levels of probability respectively with an R^2 value of 0.77. Based on these findings, it is recommended that government should construct new roads and rehabilitate rural feeder roads to ease movement of produce and also provide incentives to women to encourage them in farming. The three tiers of governments should provide adequate transportation system to help in conveying paddy rice from their place of production to the place of consumption.

Keywords: Factors; influence; price; rice and analysis.

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1. INTRODUCTION

The present day condition of continuous rise in prices of agricultural products all over the world is well known to the populace. The price increase has affected individuals in several ways such as low productivity, low income and reduction in standard of living. Among the various forces shaping the world of man, transportation is a major force which accounts for the high increase in the prices of agricultural products. Transport network link producers to markets and provide access to social and administrative services. An effective transport system support economic development through travel time and transport cost savings, lowering transports tariffs and by increasing productivity [1].

The rural areas of Nigeria are characterized by inadequate and poorly maintained infrastructure and services which results in poor rural situations [2,3]. In a study carried out by Filani [4] in rural areas of Nigeria, it was discovered that where motor-able roads exist they are mostly of unpaved surface, narrow width, circuitous alignment and with low quality bridges. In most cases, they are either clad with potholes or characterized by depressions and sagging. According to Adesanya [5], only about 5 percent of rural roads in Nigeria could be said to be in good condition. Thus, the poor state of rural transport in the country do not only lead to high vehicle operating cost but, also result in sharp increases of prices of food items [3].

Agriculture has been identified as the primary and biggest source of income in rural communities and provides employment to approximately 70 percent of its population [6]. A significant proportion of agricultural task involve moving inputs and products from one place to another which involve a wide variety of types and sizes of loads to be moved over different distances and types of terrain. The sources of food and economic products must be reasonably accessible in distributing agricultural products to the markets and factories. However, the existing transportation system mostly in rural areas of the country is poor, weak, inadequate and inefficient, expensive and too costly to operate, thus, farmers are deprived of the most viable source of investment capital due to high cost of moving their produce from the rural areas to the urban areas where they can be purchased at reasonable prices. A lot of agricultural products especially rice wastage takes place in our marketing system as a result of poor transportation and storage facilities.

Many studies have focused on the marketing of paddy rice and other aspect of it, for instance [7] studied Rice Marketing in Sri Lanka and noted that there is a great potential for marketing rice in Sri Lanka. [8] Carried out their analysis on structure and performance of paddy rice marketing in Adamawa state, Nigeria and noted that rice marketing has competitive market structure. Also, [9] studied socio economic characteristics of rice farmers in the combined states of Andhra Pradesh and found that farmers were well educated, experienced and of productive age. However, to the best of the researcher's knowledge there is little or no work on factors that influence the price of paddy rice. This is the gap the researcher intends to fill. The broad objective of this study is to examine the factors that influence the price of paddy rice in Guma, Benue State, Nigeria. The specifics objectives were to:

- I) Describe the socio-economic characteristics of rice marketers.
- II) Determine the factors that influence the price of paddy rice.

2. METHODOLOGY

The study was conducted in Benue State, Nigeria. The state lies between latitudes $6^{\circ}25'N$ and $8^{\circ}8'N$ and longitudes $7^{\circ}47'E$ and $10^{\circ}E$. Benue State is popularly known as the "Food Basket" of the Nation because of the abundance of its agricultural resources. The state is a major producer of food and cash crops Small-scale rice production and marketing is a popular business in the state. The population for this study comprised smallholder's rice farmers in Benue State. A sample of 113 small-scale rice farmers marketers from three markets in Guma local government area known for marketing were randomly selected for the study. Data were collected through the use of structured questionnaire to elicit information from the respondents.

Descriptive statistics such as frequency distribution Table and percentages were used to identify the various types of transport system used by rice marketers and also describe the socio- economic characteristics, while multiple regression analysis was used to determine the factors that influence the price of paddy rice. The model is as specified.

Implicitly

$$Y_i = f(X_1, X_2, X_3, X_4, U_i)$$

Explicitly

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + U_i$$

Where,

Y_i = Price of paddy rice
 X_1 = Transportation cost
 X_2 = Season
 X_3 = Distance to the market
 X_4 = Quality of paddy rice
 U_i = error term
 β_0 = Intercept
 β_s = Coefficients to be estimated

It was expected that $\beta_1, \beta_3, \beta_4$ will have positive relationship with price of paddy rice.

3. RESULTS AND DISCUSSION

3.1 Socio-economic Characteristics of Rice-producers Marketers

The socio-economic characteristics of rice producers' marketers studied in this research work include age distribution, sex distribution, marital status, educational level, years of experience, household size distribution, major occupation and annual income distribution of respondents. The distribution of respondents by socio-economic characteristics is as shown in Table 1.

The percentage distribution of respondents by age showed that most (41.6%) of the respondents in the study area were within the age of 31 and 40 thus, they are said to be in their active and productive age to be able to cope with the rigors of rice production and marketing [10]. The mean age of the respondents was 36 years which indicates that they are still very active. The result is in consonance with earlier studies by Girei and Onuk [11] and Samaripitha et al. [9] who noted rice farmers to be of productive age.

Also the findings on the analysis of sex distribution of respondents showed that there were more male rice producers marketers (65.5%) than females (34.5%). This is due to the rigorous nature of work associated with rice farming which makes females to avoid the enterprise in favour of less rigorous aspects of the rice value chain. The result indicates that gender influences rice production and marketing. This result agrees with earlier studies by Ayanwale and Amusan [12] whose findings showed that majority (62%) of the farmers were

males. The result of marital status shows that majority (69%) of the rice farmers were married with unmarried respondents accounting for 21.2% while widows and separated indicated 5.3% and 4.4% respectively. This finding agrees with that of [11] who stated that majority (65%) of the farmers were married.

The distributions of educational attainment of respondents in the study area showed that 20.4% of the respondents had no formal education while most (36.3%) of the respondents had primary education, 32.7% had secondary education, and 10.6% had tertiary education showing that the respondents attained some formal education with the mean number of years in school of 7 years. This implies that most rice farmers in the study area can read and write. Educational profile of the farmers decides the relative exposure of the farmer to latest technologies. This study is in agreement with the findings of [13,14] who stated that most rice farmers can read and write.

Farming experience normally deals with the number of years an individual or farmer has been practicing or participating in a particular activity. The distribution of years of rice farming and marketing experience of respondents indicate that most (39.0%) of respondents had 6 – 10 years of farming and marketing experience, followed by 29.2% of the respondents with experience of 11-15 years. Similarly, those with experience of between 16-20 years, 21-25 years, above 26 years and those with experience between 1-5 years accounted for 17.7% , 3.5%, 0.9% and 9.7% respectively. Implying that most (46.9%) of the respondents have over 10 years of experience. This indicates that most farmers' marketers have enough farming and marketing experience. The mean number of years of experience of the respondents was 9 years. Experience plays a very important role in the performance of any enterprise. This result is in tandem with the findings of [9,13], they all noted that rice farmers were well experienced.

The household size distributions of respondents in the study area showed that most of the rice farmers (47.8%) had household size of between 6 and 10 with the mean household size of 10 persons. The result indicates a large household size which can be a source of cheap farm labour. This agrees with the findings of [11] who stated that 35% of their respondents had household size of between 6 and 10.

Table 1. Distribution of respondents by socio-economic characteristics in the study area (n=113)

Variables	Frequency	Percentage (%)	Mean
Age distribution of respondents			
≤ 20	1	0.9	
21 – 30	34	30.1	
31 – 40	47	41.6	36
41 – 50	24	21.2	
50 ≥	7	6.2	
Sex distribution of respondents			
Male	74	65.5	
Female	39	34.5	
Marital status of respondents			
Single	24	21.2	
Married	78	69.0	
Widow/Widower	6	5.3	
Separated	5	4.4	
Educational distribution of respondents			
No formal education	23	20.4	
Primary education	41	36.3	6
Secondary education	37	32.7	
Tertiary education	12	10.6	
Years of experience of respondents			
1 – 5	11	9.7	
6 – 10	44	39.0	9
11 – 15	33	29.2	
16 – 20	20	17.7	
21 – 25	4	3.5	
26 ≥	1	0.9	
Household size of respondents			
1 – 5	19	16.8	
6 – 10	54	47.8	10
11 – 15	27	23.9	
16 – 20	10	8.8	
21 – 25	3	2.7	
Major occupation of respondents			
Farming	68	60.2	
Marketing	31	27.4	
Civil servant	6	5.3	
Student	7	6.2	
Fishing	1	0.9	
Income distribution of respondents			
≤ 100,000	26	23.	
101,000 – 200,000	46	40.	
201,000 – 300,000	27	23.	
301,000 ≥	14	12	

Source: Field survey 2018

The distribution of the respondents by their major occupation indicated that majority of the respondents which accounted for 60.2% were full time rice farmers while the remaining 39.8% carry out rice farming on part time basis possibly to supplement their income from other sources and this makes farming to be their secondary occupation. The finding agrees with that of [11]

who stated that majority (81.67%) of the farmers were full time rice farmers.

The sales income distribution of respondents in the study area also showed that most (40.7%) of respondents make 200,000 naira or less in sales income/annum. The mean income of the respondents per annum was 200,000 naira.

Table 2. Multiple regression estimates of the determinants of price of paddy rice in the study area

Variables	Coefficient	Std. error	T	Sig-t
Constant	9745.247	423.315	23.021	0.000
Distance	-8.338	9.738	-0.856	0.394
Quality type	165.409	77.587	2.132	0.035**
Season	0.074	0.030	2.455	0.016**
Transport cost	0.219	0.118	2.855	0.000*
Adjusted R square 0.614 R square = 0.77				

Source; Field Survey 2018; Note **and * Indicates significance at 5% and 1% probability level

This implies that most of the farmers are small holder farmers with small market share of the paddy rice market in the study area.

3.2 Factors that Influence the Price of Paddy Rice in the Study Area

The results of the factors that influence the price of paddy rice in the study area is as presented in Table 2. This was achieved through the use of multiple regression analysis. From the results, the overall F-statistics (2.264) is significant at 5% level of probability implying that the fitted variables significantly influence the price of paddy rice. The coefficient of multiple determinations (R^2) is 0.77 an implication that the fitted variables accounted for 77% variation in the price of paddy rice in the study area.

From the analysis, three variables namely quality type, season and transport cost were the important variables that significantly affect the price of paddy rice as these are significant at 5%, 5% and 1% levels of probability respectively.

Detail results shows that, the coefficient of quality type of paddy rice is positive and significant at 5% level of probability implying that the higher the quality of rice, the higher the price. In the study area, paddy rice qualities are of different types, the most expensive rice is the one with the best quality and the reverse is true. This is in line with the findings of [15], they noted that the price consumers are willing to pay for a good at a given time is dependent on the attributes of the good or commodity.

From the result the coefficient of season is positive and highly significant at 5% level of probability implying that season and price of paddy rice are directly related. It is a common knowledge that during the off peak season of production (rainy season) the price of paddy rice will be high and will be low in the peak season of production (dry season). This is supported by the work of [16] that rice

is a highly climate specific agricultural produce and therefore unfavorable weather conditions would put pressure on supplies and hence send prices higher, thus in the time of scarcity the price will be high and low in the time of plenty. They noted that rice in the dry season had lower prices and higher prices in the rainy season.

Also from the result the coefficient of transport cost is positive and highly significant at 1% level of probability implying that the higher the transportation cost the higher the price of paddy rice and vice versa. This finding agrees with that of [17] in Tanzania. They found out that transportation costs have a welfare effect in that high costs are translated into high prices for consumers and low farm gate prices for growers in Tanzania.

4. CONCLUSION AND RECOMMENDATIONS

The study had revealed that respondents were in their productive age, mostly married and educated. Quality of rice, season and transport cost are responsible for price of rice in the study area. In view of this, it is recommended that government should construct new roads and rehabilitate rural feeder roads to ease movement of produce and also provide incentives to women to encourage them in farming. The three tiers of governments should provide adequate transportation system to help in conveying paddy rice from their place of production to the place of consumption.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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