



STRUCTURE AND PERFORMANCE OF RICE MARKETING IN SELECTED LOCAL
GOVERNMENTS OF JIGAWA STATE

^{1*}Danmusa, A. H., ²Umar, A. S. S. and ³Muhammad, M. D.

¹Department of Agricultural Economics Federal University Dutsin-Ma, P.M. B5001 Dutsin-Ma, Katsina State, Nigeria.

²Department of Agricultural Economics, University of Maiduguri, P.M.B.1069, Maiduguri, Borno State, Nigeria.

³Department of Agricultural Economics Federal University Dutsin-Ma P.M. B5001 Dutsin-Ma

Corresponding authors' Email: hamisua398@gmail.com

GSM: +234813199992

ABSTRACT

The study analyzed the structure and performance of rice marketing in selected local Government Areas of Jigawa State. Multi-stage sampling technique was employed to select one hundred and twenty-two (122) wholesalers and one hundred and seventy-eight (178) retailers from the six selected LGAs. Data were collected between January to December 2023 and analysed using descriptive statistics, regression analysis, Gini Coefficient and price index. The Gini coefficient of 0.386202 for retailers and 0.390688 for wholesalers reveals the concentration in the rice markets and revealed the market structure as monopolistic competition. Regression analysis for price movement between times revealed inter-temporal price efficiency in rice markets. This confirmation was because rice marketers earned only ₦1660.16 (₦2960.16 - ₦1300) per 100kg bag of rice per month. The study concluded that local rice is price inelastic and the government should adequately provide infrastructural facilities such as good roads, excellent market facilities and so on to improve market efficiency.

Key words: Analysis, Marketing, Performance, Rice and Structure

INTRODUCTION

Rice is an important crop for the attainment of food and nutrition security in Nigeria because it is one of the major staple food in the country. Farmers cultivate rice in most parts of the country, but rapid population growth, urbanization, and changes in consumer preferences in the last decade have prevented local production from meeting demand. The high cost of rice importation has led the Federal Government of Nigeria encouraged domestic production by providing the enabling environment for the development of a vibrant rice sector that attracts local and foreign investments.

A top priority for the Nigerian Government and key rice stakeholders is increasing domestic rice production to meet the national demand. The development of the rice sub-sector has received significant resources from both the public and private sectors over the last decade. Despite making significant progress, the local production still falls short of meeting the country's demand. This has made it an important issue that needs to be tackled if the nation must attain its selfsufficiency goal. (FMANR, 2023).

Rice is one of the most consumed staples in Nigeria, consumption per capita of 32kg. In the past decade, consumption has increased 4.7%, almost four times the global consumption growth, and reached 6.4 million tonnes in 2017 accounting for 20% of Africa's consumption. Nigeria's rice statistics suggest there is an enormous potential to raise productivity and increase production. Yields have remained at 2 tonnes per hectare, which is about half of the average achieved in Asia. (PwC, 2022).



Nigeria's rice production rose from 3.7 million metric tons in 2017 to 4.0 million metric tons in 2018. However, despite this, Nigeria only locally produces 57 percent of the 6.7 million metric tons of rice consumed annually, resulting in a deficit of about 3 million metric tons, which either imported or smuggled into the country illegally. To stimulate local production, the Government banned importation of rice in 2019. (Federal Office of Statistics, 2023).

Supporting marketing functions are necessary for all economic systems to achieve increased production and productivity. Therefore, agricultural marketing is an important area of agriculture that plays a significant role in determining types of agricultural activities in the area, farmers' level of income and economic strength of the community, among other things. This study therefore sets to examine the structure and performance of rice marketing in some selected Local Government Areas of Jigawa State.

MATERIALS AND METHODS

The study Area

Jigawa State is one of the thirty-six states of the Federal Republic of Nigeria. The state is in the north-western geopolitical zone of the country. It is bordered to the west by Kano and Katsina States, to the east by Bauchi State and Yobe State to the northeast. To the north, Jigawa State shares an international border with the Republic of the Niger, thus providing unique opportunities for international trade. The State has twenty-seven (27) local government areas. It is lies between latitudes 11.00°N to 13.00°N and longitudes 8.00°E to 10.15°E. (JSG, 2021). It has a total land area of 2.42 million Ha, land available for cultivation 1.9million Ha, estimated Fadama (flood plain) 400,000 Ha, mean annual rainfall 532mm-1132mm and average annual temperature of 270 C (Jigawa State Fadama Development Project (JSFDP) 2008). The state has an estimated population of 7,499,100 people by the (NNPC,2022). Hausa/Fulani are the most predominant people found in all parts of the state. Farmers in semi-arid conditions combine dry season irrigation and flood retreat agriculture with wet season upland farming. Hence, much of the farmland is part of the vast Sudan-savannah Agro-ecological belt. Within this Agro-ecological belt, there is just one rainy season during the year. The wet season runs from May to October with rains peaking in July, August and September. Rainfall patterns upstream are also important to flood retreat and irrigation agriculture. Local rainfall, therefore, is only one part of the production picture. In the uplands, the rain-fed growing season is from June to November. From December to May, farmers usually engage in dry season Fadama farming along the Hadejia or Kafin Hausa Rivers. On the rain-fed dry land farms, maize, millet, and sorghum are the principal crops grown for food while cowpeas which are grown for consumption and sale. On irrigated farms, rice, wheat and vegetables are for subsistence and sale. Jigawa State is highly competitive in rice, sesame, hibiscus, groundnut, wheat, soya beans, sorghum, maize, sugarcane, cotton and tomato production.

Sampling Procedure and Sample Size Sampling Procedure

Multi-stage sampling technique were employed for the study. The first stage involved purposive selection of Jigawa State because of the predominance of rice production in the area. While in the second stage, random sampling technique was used to select six (6) Local Government areas out of eleven (11) L.G. A in the State. This includes, Auyo, Guri, Hadejia, Kafin-Hausa, Kaugama and Miga Local Government areas, respectively. The third stage involved random selection of one (1) market each from selected L.G.A given six (6) Markets. Final stage involved



the use of Yamane, T. (1967) formula and proportionate allocation technique to select one hundred & twenty-four (122) wholesalers and one hundred & seventy-seven (178) retailers. Giving a total of three hundred (300) respondents.

The following expression was used to determine the sample size as:

$$n = \frac{n}{1 + (N)e^2} \quad \dots(1)$$

Where:

n = Sample size determination

N = Total number of Marketers

e² = Confidence level (0.05)²

1 = Constant

Table: 1 Sample size of the Rice farmers

L.G.A	Selected market	Rice	Rice Wholesalers		Rice retailers	
			Population of Whole Sellers	No. of Rice Whole Sellers Selected	Population of Retailers	No. of Rice Retailers Selected
HADEJIA	Hadejia	67		46	120	67
KAFIN-HAUSA	Kafin-Hausa	35		24	62	34
KAUGAMA	Bukel	32		22	60	33
AUYO	Auyo	15		10	28	16
GURI	Guri	18		12	30	17
MIGA	Miga	10		7	20	11
TOTAL		180		122	320	178

Source: Field study 2023

Data collection & analysis

The researchers collected data for this study from primary sources (using questionnaires). Data were analysed using Gini Coefficient, index numbers, and regression analysis. Gini coefficient is estimated by finding the summation of the product of the mean of percentage of distributors and the mean of commutative percentage of the sales revenue and subtracting it from 1. The difference represents the Gini coefficient. The model employed is as follows;

$$G = \sum X Y \quad \dots (2)$$

Where;

G= Gini- Coefficient X= Mean of percentage of distributors Y= mean of cumulative percentage of their sale revenue.

Equations 2 and 3 were used to determine the performance of rice markets in the study area.

$$IM = PM/PY \times 100 \quad \dots (3)$$

Where;

IM =monthly price index number PM = average monthly price (Naira per bag) PY = average annual price (Naira per bag)

$$TM = \sum IM/n \quad \dots (4)$$



Where;

TM= is a seasonal price index n=

is number of years.

Regression analysis was used to determine the performance of rice markets in the area.

The specification of the regression model is: $P_t = a + bx + u_i$ (5)

Where;

P_t = average seasonal price of rice at time t

X = time in months, beginning from the month with the lowest price, a

and b are the constant and the slope, respectively.

RESULT AND DISCUSSION

Socio- Economic Characteristic of Rice Marketers

As shown in Table 2 majority of the respondents who engaged in rice wholesalers and retailers were adult. However, the mean age of wholesalers and retailers was 32.7year and 30.1years respectively. The result of age distribution shows that, about 30.3% of the wholesalers and 32% of the retailers fall within age group greater than 50 years. This agreed with the findings of Tonodo and Iheänach (2015) who reported that young people aged between 20-40 are engaged in agricultural marketing. Table 2 further depicts that most (93.4%) of the wholesalers and 93.3% of the retailers were married. And only 6.6% of the wholesalers and 6.7% of the retailers were unmarried. This may not be unconnected from the tradition of early marriage in the study area. Furthermore, the result revealed that wholesalers and retailers have undergone one form of education or the other with 43.6% of wholesales and 47.6% of the retailers acquired western education while 41% of the wholesalers and 41.9% of the retailers acquired Qur'anic education. Thus, majority of the respondents were educated. This aids the marketers in adopting improved marketing strategies. Tonodo and Iheänach (2015), reported that education influence acquisition of knowledge about new technologies.

Table 2: Distributions of Age, Marital Status & Level of Education of rice wholesalers and retailers

Variables	Wholesalers (n=122)		Retailers (n=178)	
	No.	%	No.	%
Age Years <20				
	15	12.3	19	10.7
21-30	19	15.6	26	14.6
31-40	20	16.4	35	19.7
41-50	31	25.4	41	23
>50	37	30.3	57	32
Mean		32.7		30.1
Marital Status				
Married	114	93.4	166	93.3
Unmarried	08	6.6	12	6.7
Types of Education				
Quranic Education	80	41	104	41.9
Adult Education	30	15.4	26	10.5
Formal Education	85	43.6	118	47.6



Total	195	100	248	100
--------------	------------	------------	------------	------------

Source: Field study 2023

Market Structure

The study employed Gini Coefficient as a measure of market structure of rice. The results reveal concentration in both the retail and the wholesale side of the rice markets in the study area. However, there is a greater concentration on the retail side of the market than on the wholesale side. This is confirmed by the Gini coefficient of 0.386202 and 0.390688 for wholesalers and retailers. Thus, rice wholesaling and retailing can be described as that of monopolistic competition in the study area. This study tallies with Nwall and Maureen (2019), who reported similar concentration in the Abakaliki grain markets. Market structure is the physical appearance of the market in terms of product differentiation, market integration, concentration (number and size of buyers and sellers).

Table: 3 Volume of sales from Rice marketing

Volume of Sales	Number Of Market ers	% of Market (x)	Total Income(₦) from Rice Sales	% of Total Income from Rice Sales	Cumulative Percentage of Total Income from Rice Sales (y)	XY
Wholesalers						
100,000 -300,000	16	13.1	1,274,000.00	5.6	5.6	0.0000343325
350,000- ,500,000	18	14.8	2,980,627.34	13.2	18.8	0.027824
550,000 – 700,000	32	26.2	9,483,254.86	42.1	60.9	0.159558
750,000- 950,000	48	39.3	6,955,452.68	30.8	91.7	0.360381
1,000,000 and Above.	8	6.6	1,862,654.18	8.3	100	0.066
Total	122	100	22,555,989.06	100	277	0.6137973323
Gini Coefficient G.C.						0.3862026675
= 1-ΣXY						
Retailers						
100,000 -300,000	27	15.2	2,809,312.09	8.9	8.9	0.013528
350,000- ,500,000	38	21.3	7,423,857.51	23.6	32.5	0.069225
550,000 – 700,000	46	25.8	10,712,888.83	34.1	66.6	0.168498
750,000- 950,000	57	32.1	8,629,491.33	27.5	94.1	0.302061
1,000,000 and Above.	10	5.6	1,846,928.00	5.9	100	0.056
Total	178	100	31,422,477.76	100	302.1	0.609312



Source: Field study 2023

Market Performance

Market performance is the assessment of the market in terms of efficiency, progressiveness, innovation, and employment generation. The study employed price index and regression analysis to determine temporal price efficiency and hence market performance in the study area. The study presents the results of market performance in Table 4, 5 and 6 respectively.

Table 4 present the percentage variation in price of rice. The result revealed that the highest price was recorded in April, 2023 while the lowest price was recorded in November, 2023 (the base month). This may be because of the seasonal nature of agricultural production, with supply being highest during harvest and lowest just before harvest. This is in line with the findings of Adekanye (2014) who reported that price of rice was highest before harvest and lowest after harvest.

Table 4: Monthly Price indices for Rice in the Study Area

Months	Percentages (%)
January	104.73
February	107.65
March	119.87
April	130.87
May	131.29
June	105.36
July	90.42
August	93.02
September	84.08
October	79.39
November	77.93
December	103.83

Source: Field study 2023

Monthly Movement in Price of Rice in the Study Area

Table 5 further shows that 53.81% was the total average monthly price variation for rice during the period of the study. Thus, the resulting 7.69% monthly increases in the price of rice reveals that rice traders do not exploit consumers and thus the markets performed efficiently. The finding is in line with the findings of Tolorunju, and Oladeji, (2017), who reported that an efficient market will establish prices that are interrelated through time by cost of storage and concluded that the 6-7% monthly increase in the price of cowpea is commensurate with the storage costs. The result is presented in Table 5 revealed 89.36% variation in the price of rice in the study area.

Table 5: Monthly Movement in Price of Rice in the Study Area

Crop Type	Seasonal Index		Month between Lowest & Highest	Total rise in Seasonal prices	Ave. Monthly rise in seasonal prices
	Highest month	Lowest month			
Rice	May	November	Seven (7)	58.18	8.09



Source: Field study 2023

Table 6: Regression Result of Rice Price Movement in the study area

Variable	Reg. Coefficient	T. Value	R ²	F. Value
Intercept a	28.717	27.321		
Index No. x	0.29601556	15.011	0.89356	185.63

Source: Field study 2023

Cost of storing a bag of rice per month as identified by the respondents

Table 7 shows that rice traders who engaged in inter-temporal arbitrage incurred only the cost of rent, loss in storage and cost of handling. Eight hundred naira (₦1300) was found to be the average storage cost of 100kg bag of rice/month. Comparing the monthly price rise with the estimated average monthly storage cost, it turned out that the average monthly price rise ₦2960.16/100kg bag of rice was little higher than the estimated storage cost, ₦1300/100kg bag implying that rice traders charged a little more than what it costs them in storing rice. So, it suffices to say there was inter-temporal efficiency in the rice markets in the study area. Thus, this shows that rice traders were not making an excessive profit by engaging in inter-temporal arbitrage. In fact, the result difference between the estimated storage costs ₦1300/100kg bag of rice, and monthly price rise of ₦2960.16/100kg bag of rice was not encouraging, which can result to dampening traders' interest in inter temporal arbitrage. Afolami (2021), had similar result regarding guinea corn and millet marketing in Northern Nigeria and stressed that making profit, not to talk of excessive profit, does not arise for traders engaged in guinea corn and millet inter temporal arbitrage in the study area.

Table 7: Cost of storing a bag of rice per month as identified by the respondents

Cost of Item	₦:K
Average monthly rent/100kg bag of rice	400
Average monthly loss in storage	300
Cost of handling	600
Total average cost of 100kg/bag/month	1300

Source: Field study 2023

CONCLUSION AND RECOMMENDATIONS

The study concluded that, 54% of the respondents had Western education while 46% had Qur'anic education. The study also shows that, rice markets in the study area depicted monopolistic competition. In addition, the study found inter-temporal price efficiency in the rice markets in the study area. This confirmation came from the fact that rice marketers earned only ₦1660.16 (₦2960.16 - ₦1300) per 100kg bag of rice per month. This was not excessive and thus contradicts the common allegation that marketers exploit consumers.

The following recommendation is being made:

1. Government should adequately provide infrastructural facilities such as good roads, excellent market facilities and so on to improve market efficiency.
2. The government should standardize the unit of measurement for rice throughout the nation to check the fraudulent activities in rice marketing.



3. Since government alone cannot adequately provide financial support to rice markets, wealthy marketers should also help in providing loan to their fellow marketers who are in need.

REFERENCE

- Adekanye, T. O. (2014). **Temporal and commodity price analysis; a case study for rice in western Nigeria**. In T. O Adekanye (ED), Reading in Agricultural Marketing. Ibadan, Longman Ltd, P. 143.
- Afolami, C. A. (2021). Inter-temporal and spatial pricing efficiency for guinea corn and millet in Nigeria. Department of Agricultural economics and farm management university of Agriculture, Abeokuta, Pp158-165.
- F.A.O. (2022). Rice Market Monitor, Rome, Food and Agriculture Organisation, Pp. 1-2. FMARD, (2023). Federal Ministry of Agriculture and Natural Resources, Nigeria.
- Federal Office of Statistics (2023): Rural economic survey of Nigeria; Consolidated results of Crop estimation survey.
- Jigawa State Fadama Development Project, (2008) "Draft Report of Environmental Baseline Survey of the Ten (10) Participating LGAs," Published by Versatile Agro Ventures Consultant. *Jigawa Online*, (2021): (<http://www.jigawastate.gov.ng>, 2021).
- Nwall, A. C. and Maureen, A. (2019). Marketing analysis of Locally Produced rice in Abakaliki Local Government area of Ebonyi State, Nigeria. *Mediterranean Journal of Social Sciences*, **10**(1):39-47.
- Price Water House Coopers, (2022). "Boosting Rice Production in Nigeria through Mechanization": A report published by Pwc. www.pwc.com.
- Saleh, M. K. and Oyinbo, O. (2017). Rice production under different weed management technologies adopted by farmers in Katsina State, Nigeria. *Journal of Agricultural Extension*, **21**(1):1-15.
- Tolorunju, E. T. and Oladeji, S. O. (2017). Technology gap and technical efficiency of rice production ecologies in South Eastern Nigeria. Conference Proceeding of 18th Annual National Conference of the Nigerian Association of Agricultural Economists Held at Federal University Agriculture, Abeokuta, Nigeria.
- Tonodo, D. T. and Iheanach, A. C. (2015). The Relationship Between Socio-economic Characteristics of RiceMarketing" Actors and Value Addition in Rice in Benue State"; *International Journal of Scholarly Research*, **5**(1):50-60.
- Yamane, T. (1967). **Statistic: An introductory**, 2nd Edition, New York: Harper & Row.