

## DETERMINANTS OF LOCAL RICE CONSUMPTION AMONG HOUSEHOLDS IN MAKURDI METROPOLIS OF BENUE STATE, NIGERIA

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### ABSTRACT

The determinants of local rice consumption among households in Makurdi metropolis of Benue State, Nigeria were investigated. The specific objectives of the study were to describe the socio-economic characteristics of households that consume rice; identify factors that influence households' preference for imported rice; determine factors that influence households' consumption of local rice. Data were collected from 120 households in six wards and twenty four streets using multi-stage random sampling technique. Structured questionnaire was used to collect data from heads of the households. Data collected were analysed using frequency distribution, percentages, mean and multiple regression analysis. The results indicate that households' consumption of local rice is influenced by socio-economic factors and the quality of the local rice. It was recommended that investment in local rice processing should be on equipments that will improve its quality and also setting up nutritional body and campaigns to enlighten the public on the nutritional benefits of local rice and adverse consequences of importing large tons of rice into the country respectively.

**KEYWORDS:** Factors, Consumption, Local Rice, Makurdi Metropolis

### INTRODUCTION

Consumption of local rice among households in Nigeria has continued to decline as most households now prefer the imported rice over the local rice. This trend has persisted in spite of the heavy custom duty on imported rice (Lançon *et.al*, 2003).

Several factors have been attributed for this preference such as its taste, neatness, quick cooking potential unlike the local rice (Odusina, 2008). Emodi and Madukwe (2011) reported that households are dissatisfied with local rice bought in the market and are weary of picking stones from the local rice and having to wash it several times. In spite of all effort to widen home market for the nation's local rice, its demand has continued to decline. The inability of local rice to compete with imported rice could be as a result of poor processing resulting in a final product with a high percentage of broken grains and debris (Food and Agricultural Organization, 2004).

Over the years, the country has continued to depend on importation of rice to meet the demand and preference for her teeming population. Available study (Emodi and Madukwe, 2011) revealed that Nigeria is the largest importer of rice in the world. The study also showed that between 1990 and 2002, Nigeria imported 5,132,616 tons of rice valued at US\$1,883,553.

Arising from the foregoing, there is a need to investigate the factors influencing household consumption of local rice. An understanding of these factors will spur innovative decisions among stakeholders in the local rice production system on the product offer based on the findings about consumers' attributes and attitudes towards the commodity offered. This in turn will improve local rice demand and reduce Nigeria's import on foreign rice.

There are several studies on local rice consumption such as those of Bamidele *et.al.* (2010), Idris *et.al.* (2013) and Odusina (2008). Though these studies addressed local rice consumption in various locations in Nigeria, none of such study has been done in Makurdi metropolis. Thus, this study attempts to bridge this research gap.

Specifically, this study aims to answer the following research questions: What are the socio-economic characteristics of households that consume rice? Are there factors that influence households' preference for imported rice? What are the factors that influence households' consumption of local rice?

The main objective of the study was to investigate the determinants of local rice consumption among households in Makurdi metropolis of Benue State, Nigeria. The specific objectives were to: describe the socio-economic characteristics of households that consume rice; identify factors that influence households' preference for imported rice; and determine factors that influence households' consumption of local rice.

## **METHODOLOGY**

### **Study Area**

This study was conducted in Makurdi metropolis, the capital city of Benue State in Nigeria. The city lies between latitude  $7^{\circ} 45'$  and  $7^{\circ} 52'N$  and longitude  $8^{\circ} 35'$  and  $8^{\circ} 41'E$  and has a land area of  $804\text{km}^2$ . The study area shares boundary with Gwer-West, Gwer, Guma and Gboko Local Government Area.

It has a population of 300,377 which is made up of 154,138 male and 146,239 female (NPC, 2006). The study area has two seasons: wet season (May to October) and dry season (November to April). This area is also endowed with rich alluvial soil.

The city is dominated by farmers including paddy rice producers, small scale rice processors, traders who retail imported rice, local rice and in some cases retail both the imported rice and the local rice.

### **Population and Sample Selection**

The population of this study consists of all households in Makurdi metropolis. As a result of the enormity of the population of this study, a sample size of 120 households was selected using multi-stage random sampling techniques.

In the first stage, six wards were randomly selected from the nine wards that make up Makurdi metropolis. In the second stage, four streets were randomly selected from each of the six wards making a total of 24 streets selected.

In the third stage, from each of the selected streets, five households were randomly selected, thus giving a sample size of 120 households.

### **Data Collection**

The data for this study were collected from primary source using a well-structured questionnaire. Data were collected on socio-economic characteristics of respondents, factors that influence preference for imported rice and factors that influence the consumption of local rice. Secondary sources of data include scholarly journals, government publication.

### Data Analysis

Descriptive statistics like frequency distribution mean and percentages were used to describe the socio-economic characteristics of local rice consumers and factors that influence households' preference for imported rice. Multiple regression analysis was used to determine factors that influence households' consumption of local rice.

### Model Specification

The model was implicitly expressed as follows:

$$Y=f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, U) \text{ where:}$$

Y=Household monthly expenditure on local rice (Naira)

X1=Household monthly income (Naira)

X2=Household monthly expenditure on food (Naira)

X3=Household monthly expenditure on imported rice (Naira)

X4=Household size (Number)

X5=Age of household head (Years)

X6=Educational level of household head (Years)

X7=Quality of local rice (low=0, high=1)

X8=Sex (male=0, female=1)

X9=Marital status1 (married=0, single=1)

X10=Marital status2 (married=0, widowed=1)

U=Stochastic term

Different functional forms: the linear, semi-log, double-log and exponential were tried and the most closely fitting chosen on the basis of the statistical significance of the regression coefficients, the coefficient of determination ( $R^2$ ) and *a priori* expected signs of the coefficients.

The *a priori* expectation was such that the coefficients of household monthly income, household monthly expenditure on imported rice, and educational level of household head, sex, and marital status1 would be negative while those of household monthly expenditure on food, household size, age of household head, quality of local rice, marital status2 would be positive.

The explicit forms of the model were expressed as follows:

### Linear Function

$$Y=b_0+b_1X_1+b_2X_2+b_3X_3+b_4X_4+b_5X_5+b_6X_6+b_7X_7+b_8X_8+b_9X_9+b_{10}X_{10}$$

### Semi-log Function

$$Y=b_0+b_1\ln X_1+b_2\ln X_2+b_3\ln X_3+b_4\ln X_4+b_5\ln X_5+b_6\ln X_6+b_7\ln X_7+b_8\ln X_8+b_9\ln X_9+$$

$$b_{10}\ln X_{10}$$

### Double-log function

$$\ln Y = b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + b_9 \ln X_9 +$$

$$b_{10} \ln X_{10}$$

### Exponential Function

$$\ln Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9 + b_{10} X_{10}$$

$$b_0 = \text{constant}$$

$$b_1 - b_{10} = \text{regression coefficients}$$

$$\ln = \text{natural logarithm}$$

## RESULTS AND DISCUSSIONS

### Socio-Economic Characteristics of Household That Consume Rice

The distribution of respondents according to socio-economic characteristics is presented in Table 1.

**Table 1: Socio-Economic Characteristics of Respondents**

Characteristics	Frequency (n=120)	Consumers (%)	Mean
<b>Sex</b>			
Male	63	52.50	
Female	57	47.50	
<b>Marital Status</b>			
Single	31	25.83	
Married	83	69.17	
Widowed	6	5.00	
<b>Rice Preferred</b>			
Local	57	47.50	
Foreign	63	52.50	
<b>Educational Status</b>			
Formal education	116	96.67	
No formal education	4	3.33	
<b>Age (Years)</b>			
20-29	40	33.33	
30-39	33	27.50	37
40-49	29	24.17	
≥50	18	15.00	
<b>Household Size</b>			
1-5	63	52.50	
6-10	52	43.33	5
>10	5	4.17	

Source: Field Survey, 2013

The result indicates that majority of households (52.50%) that consumes rice were headed by male while 47.50% were headed by female. This high consumption of rice by male-headed households is due to their occupational demand, the ease and quickness in rice preparation for table use. This is in consonance to Akande (2001) who observed that an associated change in family occupational structures accounts for the high consumption of rice in Nigeria. Emodi and Madukwe (2011) further pointed out that the high consumption of rice by households was due to the ease in its preparation

for table use and its soft texture which pleases the palate and the stomach.

Majority (69.17%) of the households' head were married while 25.83% and 5% were single and widowed respectively. The high consumption of rice by household's head that are married can be attributed to a positive shift in household size brought about by procreation. This agrees with Akande (2001) who opined that the soaring demand for rice in Nigeria was partly the result of increasing population growth and some other factors.

Also, the result reveals that majority (52.50%) of the households head preferred the foreign rice while 47.50% preferred the local rice. This high preference for imported rice is due to its perceived high quality as it is appealing, void of stones, debris and offensive odour. This agrees with Bamidele *et.al.* (2010) who reported that 90.0% of households preferred imported rice due to its high quality and grade.

The table shows that 96.67% of the household heads had formal education while 3.33% had no formal education. This implies that the household head are literate and probably in a more convenient financial position to buy rice than some of their illiterate counterparts. This is in consonance with Worsley *et.al.* (2003) who opined that per capita income is extensively related to the consumption of individual foods, total and food group indexes.

The result also shows that 33.33% of the household heads fall within the age bracket of 20-29 years. The mean age was 37 years. This indicates that most of the households' head are young and active and thus require milled rice to meet their daily carbohydrate and protein needs for sustenance. This corroborate the finding of Emodi and Madukwe (2011) who reported that active consumers settles for energy given food like rice for their daily energy requirements.

Furthermore, the results indicate that 52.50% of the households had 1-5 persons while 43.33% and 4.17% had 6-10 persons and more than 10 persons respectively. The mean was 5 persons per household. This implies that most of the households are small size and probably will have more disposable income to buy rice than households with large size. This agrees with Akande (2001) who reported that the high demand for rice in Nigeria could also be attributed to increased income levels.

**Factors Influencing Households' Preference for Imported Rice**

The distribution of households according to factors justifying imported rice purchase is presented in Table 2.

**Table 2: Factors Justifying Imported Rice Purchase**

Factors	Frequency (n=120)	Household (%)*
Cleanliness	54	45.00
Cooking time	29	24.17
Swelling capacity	9	7.50
Stone and sand free	60	50.00
Grain shape	3	2.50
Less-starchy/Non-sticky	10	8.33
Ostentation	17	14.17
Taste	18	15.00
Colour	4	3.33
Odour	2	1.67
Nutritious	1	0.83
Availability	1	0.83
Packaging	1	0.83

Source: Field Survey, 2013.

\*Multiple responses existed, hence >100%.

The result indicates that majority (50%) of households' head attributed freedom from stones and sand as a reason for their purchase of imported rice. This is followed by 45% of household heads who attributed their purchase of imported to cleanliness. This implies that household heads are dissatisfied with local rice which involves a lot of time in its preparation for table use in terms of stone picking and several washing. The finding corroborates the observation of Emodi and Madukwe (2011) who reported that consumers are dissatisfied with local rice bought in the market and are weary of picking stones from local rice and having to wash it several times. Furthermore, Lançon *et.al.* (2003) confirmed that imported rice cleanliness is the major factor for its high patronage in Nigeria at the expense of local rice market development and in spite of an increasing tariff barrier.

### Factors Influencing Households' Consumption of Local Rice

The linear regression model was employed in the analysis of factors influencing households' consumption of local rice. The selection was based on the magnitude of  $R^2$ , the *a priori* expectation and the statistical significance of the estimated regression coefficients. The linear function had the best fit and was selected as the lead equation for the analysis. The estimated relationship is presented in Table 3.

**Table 3: Regression Estimates of Factors Influencing Local Rice Consumption**

Variables	Coefficients	Standard Error	T-value	Sig
Constant	460.224	828.672	0.555	0.580 <sup>NS</sup>
Monthly income ( $X_1$ )	-0.005	0.004	-1.282	0.202 <sup>NS</sup>
Monthly expenditure on food ( $X_2$ )	0.011	0.011	0.979	0.330 <sup>NS</sup>
Monthly expenditure on foreign rice ( $X_3$ )	0.116	0.042	2.742	0.007***
Household size ( $X_4$ )	215.221	50.146	4.292	0.000***
Age of household head ( $X_5$ )	2.626	15.443	0.170	0.865 <sup>NS</sup>
Years in formal school ( $X_6$ )	-93.666	33.647	-2.784	0.006***
Quality of local rice ( $X_7$ )	2753.396	293.015	9.397	0.000***
Sex ( $X_8$ )	-865.977	326.459	-2.653	0.009***
Marital status1 ( $X_9$ )	-307.509	395.899	-0.777	0.439 <sup>NS</sup>
Marital status2 ( $X_{10}$ )	2197.337	705.148	3.116	0.002***
F-value	18.755			0.000***
$R^2$	0.632			
Adjusted $R^2$	0.599			

Source: Author's Econometric Estimation of Field Data (2013) Using SPSS

Dependent variable=monthly expenditure on local rice ( $Y_i$ )

\*\*\*=Significant at 1%. NS=Not significant.

Mathematically;

$$Y_i = 460.224 - 0.005X_1 + 0.011X_2 + 0.116X_3 + 215.22X_4 + 2.626X_5 - 93.666X_6 + 2753.396$$

$$X_7 - 865.977X_8 - 307.509X_9 + 2197.337X_{10}$$

The result indicates that 63.2% of the variation in the level of monthly expenditure on local rice was explained by the independent variables included in the linear regression model as shown by the  $R^2$ . The implication is that 36.8% of the variation in the level of monthly expenditure on local rice was caused by factors not included in the model such as government policies.

Analysis of the result shows that monthly expenditure on foreign rice ( $X_3$ ) was significant at 1% and positively related to the monthly expenditure on local rice. The positive sign of the coefficient is in contrast with the *a priori* expectation, implying that as monthly expenditure on foreign rice increases, monthly expenditure on local rice also increases. This relationship can be attributed to households' head preference for *tuwo* which is local dish exclusively prepared using local rice. This agrees with Lançon *et.al.* (2003) who observed that local rice attributes were appreciated for the preparation of a local dish called *tuwo*.

The coefficient of household size ( $X_4$ ) was significant at 1% and positively related to the monthly expenditure on local rice. It conforms to the *a priori* expectation. This means that as the household size increases, monthly expenditure on local rice increases. *Ceteris paribus*, an increase in household size implies a decrease in the household head's disposable income and thus, an increase in local rice consumption. This is in consonance with Bamidele *et.al.* (2010) who reported that large households tend to consume more of the cheaper local rice than small households due to their less per capita income than small households.

The coefficient of years in formal school ( $X_6$ ) was significant at 1% and negatively related to the monthly expenditure on local rice. It agrees with the *a priori* expectation. This implies that the higher the number of years in formal school, the less the monthly expenditure on local rice and vice versa. Household heads that are literate would probably be in a more convenient financial position to buy imported rice than their illiterate counterparts. This agrees with Wardle *et.al.* (2000) who reported that people from higher socio-economic status background tend to consume food which are more luxurious than food consumed by those of lower socio-economic status.

The coefficient of quality of local rice ( $X_7$ ) was significant at 1% and positively related to monthly expenditure on local rice. This conforms to the *a priori* expectation. This implies that the higher the quality of local rice, the higher the expenditure on local rice. *Ceteris paribus*, an improvement in the quality of local rice would increase its patronage as most consumers believe that it taste better and is more nutritious than the imported rice. This is supported by Odusina (2008) who reported that if the quality of local rice is improved and made comparable with the imported rice, its patronage would increase.

The result also shows that the coefficient of sex ( $X_8$ ) was significant at 1% and negatively related to the monthly expenditure on local rice. It conforms to the *a priori* expectation. This means that a unit change in the sex of the household head from male to female would reduce the monthly expenditure on local rice. Generally, most women are not economically empowered which affects their disposable income negatively and thus, lowers their level of rice consumption. This agrees with Ashford (2001) who reported that women occupy lower-paid and lower-status jobs than men and their unemployment status is higher than men which in turn, affects their choice and level of food consumed.

Furthermore, the coefficient of marital status<sup>2</sup> ( $X_{10}$ ) was significant at 1% and positively related to monthly expenditure on local rice. The positive sign of the coefficient is in consonance with the *a priori* expectation, implying that a shift in household head from married to widowed would increase the monthly expenditure on local rice. The death of husband and breadwinner of a household usually brings hardship on his household. The underpowered widow economically, thus settles for the cheaper local rice. This is corroborated by Odusina (2008) who reported that the meager income of households accounted for their reduced consumption of foreign rice and high consumption of local rice.

## CONCLUSIONS AND RECOMMENDATIONS

Evidence from the study indicates that households' consumption of local rice is influenced by socio-economic factors and quality of the local rice. Thus, any attempt to improve households' consumption of local rice must take into consideration these factors. On the basis of this, the following recommendations were made:

- Investment in local rice processing should be centered on equipments that will eliminate stones and sand in local rice and also improve its cleanliness.
- Campaigns aim at creating awareness on the negative effect of importing large tons of rice on the development of the nation's rice market should be encouraged.
- A nutrition body that will enlighten the public on the nutritional benefits of local rice over imported rice should be set up.

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