Assessment of the Effect of Consumption of Lake Rice on Food Security of Households in Lagos State, Nigeria

*ShehuAbdulganiyu SALAU,HikmahDamilola ABDULSALAM and Olatunji Yusuf AMBALI

College of Agriculture, Kwara State University, Malete, Nigeria

Corresponding author: talk2salaushehu@yahoo.com

Abstract: In Nigeria, food insecurity is still a critical challenge among rural and urban households. To enhance the country's food security status, a novelty was introduced to the nation's drive towards self-sufficiency in food production in 2016 when Lagos and Kebbi States launched the much-awaited Lagos-Kebbi Rice, christened LAKE RICE. Thus, this study assessed the effect of the consumption of Lake Rice on food security of households in Lagos state, Nigeria**.**Random sampling technique was used to pick 200 farming households for this study. The analytical tools include: descriptive statistics, likert scale, food security index and logistic regression. The result implied that majority of the sampled respondents were male with an average household size of 6 persons. The food insecure and secure households' were 26% and 74% respectivelywhen Lake Rice was consumed. On the other hand, the percentage of food insecure and secure households was 29.5% and 70.5% respectively when other rice was consumed. The result indicated that the introduction of Lake Rice has to certain extent reduced the food insecurity of households. This is probably because Lake Rice is readily accessible, available and highly consumed than other rice.The logistic regression suggested that age of the respondents, family size, income and amount of Lake Rice consumed were the critical determinants of food security among households. The most effective coping strategies adopted by the respondents is reduction in daily/monthly spending.The government should encourage the production of Lake Rice by given soft loans to farmers. Policies and strategies that reduce household size should be enthusiastically pursued to reduce food insecurity.

Key words: Agriculture, coping strategies, food security and logistic regression

1. Introduction

Food is fundamental to life. It is considered as the basic means of nourishment, and a recommended food intake in terms of quantity and quality, is critical for healthy and productive life (FAO, 2005). Food occupies a large part of a typical Nigerian household budget. The need for food is topmost in the hierarchy of needs. Thus, the achievement of food security is crucial to any given country. Food security is when people at all times have social and economic access to

sufficient, safe and nutritious food to meet their dietary needs and health (FAO, 2006). Food insecure households are households whose food intake drops below their minimum calorie (energy) requirements, and those who exhibit physical symptoms caused by energy and nutrient deficiencies resulting from inadequate diets. In Nigeria, food insecurity is still a critical challenge among rural and urban households (Ifeoma and Agwu 2014). The cost of food insecurity is substantially high. The country's food security situation was deepens by the poor performance of the agricultural sector. This creates food availability and accessibility challenges at the local and national levels (Aliu, 2018). Consequently, it becomes more pertinent to increase the productivity of the sector.

To enhance the performance of the agricultural sector, a novelty was introduced to the nation's drive towards self-sufficiency in food production in 2016 when Lagos and Kebbi States launched the much-awaited Lagos-Kebbi Rice, christened Lake Rice. The initiative is not only to ensure food security but to showcase Nigeria's potentials in rice production. Both Lagos and Kebbi State governments signed a Memorandum of Understanding (MoU) in March 2016, to produce Nigerian rice to ensure food security and also to showcase the ability of Nigeria to become a producing nation. The partnership is expected to expand the rice production for Lagos that has the largest consumption market to absorb it. A 50kg bag of the rice sells for ₦12,000. Unlike imported rice that has five to six years storage life span, Lake Rice is fresh (Vanguard Newspaper, 2016). The addition of Lake Rice to the local varieties like Abakaliki and Ofada rice is a major leap towards self- sufficiency in food production. The idea is to prevent Nigeria from being a dumping ground for expired imported rice. The partnership would in the nearest future lead to an expansion of production of the rice. Kebbi State has comparative advantage in area of rice production, Lagos boasts of the largest consumption market, as the Lake Rice can stand any integrity test in Nigeria.Many studies (Omonona*et al.,* 2007; Babatunde*et al.,* 2007; Amaza*et al*., 2008; Ahmed *et al*., 2015) have been carried out on factors influencing food security of households. However, none of these studies have assessed the effect of the consumption of Lake Rice on food security of respondents.Thus, this study determines the food security status of the respondentsassesses the effect of consumption of Lake Rice on food security and identifies the effective coping strategies adopted by the respondents in reducing theeffects of food insecurity.

2.   Materials and Methods

2.1 Area of study

Lagos state was chosen for this study because it is the second populous state in Nigeria next to Kano state with a population of over 21 million people (NPC, 2016). The state was created on 27th May 1967. Lagos state is arguably the most economically important state of the country (Nigerian Congress, 2005).

Figure 1: Map of Lagos showing the various communities

Lagos state is situated in the South Western Nigeria within latitude 602'N to 604'N and longitude 2045' E to 4020'E (Figure 1). The state is bounded from the North and East by Ogun State, in the West by the Republic of Benin and the South by the Atlantic Ocean. The total land mass of the state stretches over 3,345 kilometers with an estimated population of about 15 million. About 40% of the total land area in the state is covered by water and wetlands. There are Lagoon, and creeks, wetlands, barrier islands, beaches and estuaries in the state. It has 20 Local Governments Areas (LGAs) namely: Agege, Alimosho, Ifako-jaye, Ikeja, Kosofe, Mushin, Oshodi-isolo, Somolu, Apapa, Eti-Osa, Lagos Island, Lagos mainland, Surulere, Ajeromifelodun, Amuwoodofin, Ojo, Badagry, Ikorodu, IbejuLekki, Epe. The urban areas include: Lagos mainland, Ikeja, Surulere, Lekki, Lagos island etc. while the rural areas include; Epe, Ojo, Badagry, Ijede, Eputu, Ikorodu etc.

2.2 Methods of data collection and sampling

Essentially, structured interview schedule was employed to gather the primary data. A two- stage random sampling procedure was adopted for this study. Five out of the 20 LGAs were randomly selected in the first stage. The chosen 5 LGAsare: Lagos Island, Badagry, Ikorodu,Surulere, Epe and Ijede.Forty households were selected randomlyfrom each LGA in the second stage to make up a sample size of 200 households. Information were collected from the respondents on socio-economic characteristics, food consumed, consumption expenditure, monthly income, perceived effects of food insecurity and coping strategies adopted in reducing the effects of food insecurity.

2.3 Analytical methods

Descriptive statistics, food security index and logistic regression were the analytical tools used to achieve the objectives of this study. Descriptive analysis was used to describe the socio-economic characteristics and the coping strategies employed by households to minimize food insecurity.Using food security index, the households were classified into food secure and food in secure households.

The index is given as:

Fi = Per capita food expenditure for the $_i$th household/ 2/3 mean per capita food expenditure of all households

Where Fi = Food security index

When Fi > 1= Food secure ith household

Fi < 1= Food insecure ith household.

A given household is said to be food secure, if the per capita monthly food expenditure is higher or is equal to two third of the mean per capita food expenditure. While, a food insecure household is that whose per capita food expenditure is lower than two-third of the mean monthly per capita food expenditure (Omonona*et al.,* 2007).

Based on the result of food security index (Fi), a binary logistic regression model was estimated to identify determinants of food security.

Binary logistic regression model is given as:

$Z = m_o + m_1X_1 + m_2X_2 + \ldots + m_kX_k + u$

Where Z = Logit for food security = Logit (p)

mo= Constant

$m_1, m_2, \ldots, m_k$ = the regression coefficients which interpret the effect of Xon Z

X = independent variables

K = number of independent variables

P = probability of presence of characteristic of interest

u = error term

The independent variables are:

X_1 = Age of the respondent (years)

X_2 = Sex of household head (D=1 for male; D=0 for female)

X_3 = Number of years of schooling (years)

X_4 = Family size (number)

X_5 = Total amount of lake rice consumed (kg)

X_6 = Household per capita income (₦)

Multicollinearity test conducted between X_5 and X_6 indicated that there was 3.1% correlation

between the two variables and are statistically not significant as shown in the Table 1.

Table 1: Correlation between the amounts of Lake Rice consumed and average monthly income

		Average monthly income	Amount of Lake Rice consumed
Average monthly income	Pearson correlation	1	0.031
Sig (2 tailed)			0.663
N		200	200
Amount of Lake Rice consumed	Pearson correlation	0.031	1
Sig (2 tailed)		0.663	
N		200	200

Field analysis, 2018

3. Results and Discussion

3.1 Socio-economic characteristics of respondents

Of the sampled respondents80.5% were males and 19.5% were females with an average age of 48 years (Table 2).

Table 2: Socio-economic characteristics of the sampled respondents

Variables	Frequency	Percentage	Mean	STD
Gender				
Male	161	80.5		
Female	39	19.5		
Age			48.14	5.832
20-30	1	0.5		
31-40	18	9		
41-50	106	53		
51-60	71	35.5		
61 and above	4	2		
Marital Status				
Single	9	4.5		
Married	151	75.5		
Divorced	11	5.5		
Widow	22	11.0		
Widower	7	3.5		
Household Size			5.925	2.447
1-5	90	45.0		
6-10	99	49.5		
11-15	11	5.5		
Educational Level				
No formal education	15	7.5		
Primary education	11	5.5		
Secondary education	55	27.5		
Tertiary education	119	59.5		
Religion				
Islam	104	52		
Christianity	96	48		
Occupation				
Civil servant	99	49.5		
Trader	91	45.5		
Artisan	10	5.0		
Access to credit facility				
Yes	163	81.5		
No	37	18.5		

Source: field survey, 2018

This suggests that males are mostly the household head (breadwinner) of a family, only certain circumstances such as death of the husband or other reasons makes female the head of the household.The average household size is 6 persons. The average age of the respondent is 45 years. Age is a critical variable which can affect the ability and agility with which the head

provides the food needs of the household. An old household head is more likely to have larger family size and may lack the energy required to work for the upkeep and sustenance of the households. About 50% of the household heads were civil servants, 45.5% were traders and 5% were artisans. This implies that, for maximum food security to be attained in a society there is need for sufficient stable jobs and employment opportunity. Majority (81.5%) of the household heads had access to credit facilities. Access to credit facilities, to a very large extent determine the type of food consumed and consumption expenditure of households. A large (59.5%) proportion of the household heads had tertiary education. It is believed that respondents are able to take good decisions which will likely enhance their food security status, given this literacy level (Babatunde*et al.,* 2007).

3.2 Food security status of households

The estimated 2/3 PCMFE was ₦4417.797.Therefore, households whose MPCFE is lower and higher than₦4219.787 were said to be food insecure and food secure respectively. Hence, 26% and 74% of the households were food insecure and food secure respectively when Lake Rice wasconsumed (Table 3). On the other hand, the percentage of food insecure and secure households was 29.5% and 70.5% respectively when other rice was consumed (Table 4). This suggests that the introduction of Lake Rice hasreduced the food insecurity of households.

Table 3: Food security status of households when Lake Rice wasconsumed

		Frequency	Percent
	food insecure	52	26.0
Valid	food secure	148	74.0
	Total	200	100.0

Table 4: Food security status of households when other rice was consumed

		Frequency	Percent
	food insecure	59	29.5
Valid	food secured	141	70.5
	Total	200	100.0

As indicated in Table 5 and 6, there was significant difference (0.000) between the mean consumption of Lake Rice (0.7600) and other rice (0.7000). The mean increase (0.0600) at 95%

level of confidence interval, stressing from lower boundary (0.02680) to upper boundary (0.09320).

Table 5:Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	food security status for consumption of lake rice	0.7600	200	0.42815	0.03028
	food security status for consumption of other rice	0.7000	200	0.45941	0.03249

Table 6:Paired Sample Test

Food security status for consumption of Lake Rice - food security status for consumption of other rice	t-statistics	3.564
	Df	199
	Sig. (2-tailed)	0.000
	Mean Difference	0.06000
	Std. Error Difference	0.01683
	95% Confidence Interval Lower of Difference	0.02680
	Upper	0.09320

Field analysis, 2018

3.3 Effect of Lake Rice onfood security

The drivers of food security among the sampled respondents are shown in Table 7. TheNagelkerke R Squarevalue of 83.6% suggested that the total variation in the explained variable was accounted for by the explanatory variables.

Table 7: Determinant of food security among the respondents

Variable	Coefficient	Standard Error	Sig.
Gender	0.630	0.983	0.522
Age	0.253	0.090	0.005**
Family size	-1.211	0.268	0.003**
Education	0.140	0.553	0.800
Income	0.000	0.000	0.000*
Lake Rice consumption	1.512	0.392	0.000*
Constant	0.858	2.705	0.751

Source: Field survey, 2018. * **significant at 1% and 5% levels respectively; Nagelkerke R^2 = 83.6%

The result indicated that age, family size, income and amount of Lake Rice consumed were the significant determinants of food security among the respondents. The age of the household head

is positive and significant at 5% level of probability. This result suggests that younger household head would be more food secure than older ones. Positive relationship was also observed between income of the household and food security. This connotes that the higher the income the more a particular household is food secured. Furthermore, thecoefficient of the amount Lake Rice consumed is positively related with food security at 1% level of probability. Households who consumed Lake Rice is more likely to be food secure than those who consume other rice. On the contrary, the coefficient of family size is negative and is critical at 1% level of probability. This suggests that household with larger family size are more likely to be food insecure.Surprisingly, education and gender of the household heads were not important in determining food security of households. These findings are not in consonance with that of Omonona*et al*.(2007), Babatunde*et al*. (2007) and Amaza*et al*. (2008) who found out that sex and education are important factors driving food security of households. This could probably because most of the respondents are in their active age and about 60% of them had tertiary education.

3.4 Coping strategies adopted by the respondents

The most important coping strategies adopted by the respondents are presented in Table 8.

Table 8: Coping strategies adopted by the respondents

Coping strategies	Frequency	Percentage
Reduction in daily/monthly expenditure	30	15
Eating less expensive foods	15	7.5
Reduced quality and quantity of food chewed	25	12.5
Eat whatever is available	23	11.5
Minimize food variations	10	5
Doing other jobs to raise money	20	10
Engage in borrowing	10	5
Using money budgeted for other things to purchasefood	20	10
Obtain food from relations	12	12.5
Foregoing one or two meals per day	11	5.5
Consuming less preferred foods	14	7
Purchasing food on credit	10	5

Source: field survey, 2018.

Most (15%) of the respondents were engaged in the reduction in daily/monthly expenditure to reduce the effects of food insecurity on the households. This could probably because a large (50%) proportion of the respondents were civil servant. About 13%, 12.5% and 11.5 of the respondents employed reduction in quality and quantity of food consumed, obtain food from relations and eat whatever is available to curb food insecurity respectively.

4. Conclusion and Recommendations

This studyassessedthe effect of consumption of Lake Rice on food security of households in Lagos state, Nigeria. The findings showed that 26% and 74% of the households were food insecure and food secure respectively when Lake Rice wasconsumed. On the other hand, the proportionsof food insecure and secure households were 29.5% and 70.5% respectively when other rice was consumed. This connotes that consumption of Lake Rice has lessen food insecurity in the area. Furthermore, age of the respondents, family size, income and amount of Lake Rice consumed were the significant factors influencing food security among the respondents.The most critical coping strategies adopted by the respondents to curbthe effects of food insecurity are reduction in daily/monthly expenditure.The government should encourage the production of Lake Rice by given necessary incentives to farmers. Policies and strategies that raises household income as well as lowers family size should be vigorously pursued to reduce food insecurity in the country.

References

Ahmed F.F., Eugene, C. E. and Abah, P. O. (2016).Analysis of food security among farming households in Borno State, Nigeria.*Journal of Agricultural Economics, Environment and Social Sciences 1(1):130-141*

Akinsanmi A. and Doppler, W. (2005).Socio-economic and food security of farmingfamilies in Southeast Nigeria. Paper presented at Tropentary, 2005, Conference on international agricultural research and development, University of Honhentiem, Stuttgart, Germany.

Ali, R. O. (2018). *The Effect of Sustainable Land Management Technologies on Farming Households' Food Security in Kwara state, Nigeria (*M.Sc. thesis). Kwara State University, Malete, Nigeria.

Amaza, P.S., Adejobi, A.O. and Fregene, T. (2008). Measurement and determinants of food insecurity Northeast Nigeria: Some empirical policy guidelines. *Journal of Food, Agriculture and Environment,* 6 (2): 92-96.

Babatunde, R.O. Omotesho, O. and Sholotan, O.S. (2007).Socio-economic characteristics and food security status of farming households in Kwara State, North-Central Nigeria.*PakistanJournal of Nutrition, 6, 49-58.*

FAO,(2005).Food and agricultural organization.The state of food insecurity in the world, 2005, Rome, 2.

FAO, (2006).State of food insecurity in the World: Eradicating world hunger, taking stock tenyears the World Food Summit. Rome, Italy.

National Population Commission (NPC)(2016). National population of Nigeria.

Nigerian Congress, (2005) - Administrative Division DescriptionArchived 2005-12-25 at the Wayback Machine.

Ifeoma, J. I., and Agwu, E.A (2014).Assessment of Food Security Situation among Farming Households in Rural Areas of Kano State, Nigeria.*Journal of Central European Agriculture,* 15(1): 94-107

Omonona, B., Agoi, T. and Adetokunbo, G. (2007). An analysis of food security situation among Nigerian urban households: Evidence from Lagos State, Nigeria. *Journal of Central of European Agriculture.*8(3): 399-406.

Vanguard Newspaper, 10[Th] January, 2017.