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Research Article

FOOD DEMAND ANALYSIS AMONG RURAL HOUSEHOLDS IN OYO STATE, NIGERIA

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ABSTRACT
Amidst growing concern on the impact of malnutrition on agricultural production globally, this study examines food demand situation among rural household in Oyo State. An Almost Ideal Demand System (AIDS) Model was used to assess the determinants of the demand for food items among rural household. The study shows that the demand for all food is affected by total food expenditure and that rural households consider non staple food items as luxury. Considering the fact the situation is capable of undermining the potential for health and economic growth of the rural household, this study recommends the need for specific policies targeted at improving household income with a view to enhancing the nutritional intake of the rural households.

Key Words: *Food Demand, Own Price and Cross Elasticity, Rural Households, AIDS Model*

INTRODUCTION
Background to the Study
Nigeria remains African's most populous country with a population of about 140 million (National Population Commission, NPC, 2007). Agriculture is the most important sector of the economy. The role of agriculture cannot be overemphasized given its impotents in the life of human beings. Agriculture is expected to ensure adequate supply of food to the people. It is the main source of food for most of the population (Okumadewa et. al., 1999). It is however disheartening to note that economic deregulation in Nigeria has in a very short time brought about a reduction in household income levels and this effect, the livelihood patterns including food consumption of most rural households have remain were deplorable (Mbanasor 1999). On the national level, per capital growth of production of major foods in Nigeria has not been sufficient to satisfy the demands of an increasing population (Kormawa, 1999). The result is a big gap between national supply and national demand for food. Progress in the agricultural sector has remained unsatisfactory. Common staples in most Nigerian homes are insufficient and do not provide a balanced diet as such, malnutrition is prevalent in most homes. This has led to massive importation of foods and massive foreign debt (CBN, 1996).
Food remains a basic human need and major source of nutrients needed for human existence, hence, the need for its availability and accessibility (USAID, 1992). Globally, there is enough food for all, but more than 780 million people are chronically malnourished (FAO 1996). Millions of people in the developing world simply cannot obtain the food they need for a healthy and productive life. Over 90% of total agricultural production is used for domestic consumption and less than 3% of quantity of food consumed is imported (FAO, 2003). However, the influence of urban demand for food and labour is unevenly spread in the country. Increase in food demand generated by the growth of cities and expansion of transport capacities is a major driving force of agricultural production and modernization.
Statement of the Problem
Of all the human requirements, food is obviously the most basic need. In essence food is required for human existence. However, different classes of food are sometimes necessitated by subordinate motives such as festive, occasions, prosperity and religions. Thus, rural households' food requirement is often associated with socioeconomic background of the households. Access to the adequate quantity and quality of food is very important to rural and agricultural productivity. It is however observed that rural households are declining in productivity due probably to the fact that they are not able to access the right kind and quality of food items required for them to be healthy and productive.

Objectives of the Study

The general objective is to evaluate food consumption pattern among rural household in Oyo State.

The specific Objectives are to:

i. determine food consumption pattern of rural households; and
ii. examine the determinants of food demand among the rural households.

METHODOLOGY

Study Area

This research was carried out in Oyo North East zone of Oyo Nigeria. The North-East zone of Oyo state is a geographical area which consist of the following local government areas: Irepo, Iwajowa, Itesiwaju, Orire, Iseyin, Atisho Kajola, Ogbomosho, Oorelope, Olorunshogo, Saki East. These areas are generally remarkable for agricultural production with soils suitable for commercial production of most staple food crops.

The zone is geographically large as seen from the relative distance of capital cities of state from Ibadan. Climatically, the zone consists of a thick forest with dangerous animal also surrounded by mountains. Maximum daily temperature ranges from averages as low as 23^0C. There are dry season and wet season. The wet season which normally begins around April continues with annual rainfall ranging between 100-1800mm, till November. The dry season thereafter set in with the cold harmattan period ushered in around November/December till January/February. The zone is endowed with areas of agriculturally fertile land.

Source and Methods of data collection

Data used for this study were derived mainly from primary and secondary data. The primary data were generated by means of well structured questionnaires. Data centering basically on consumption pattern, prices, expenditure and socioeconomic characteristics were collected from household through structured questionnaires.

Sampling Procedure

In the choice of individual respondents, a four-stage sampling technique was used. The first stage was the purposive selection of the Oyo North zone of the state. The second was the random selection of three local government areas from the zone. The third stage was the random selection of two villages across the selected local government areas. The last stage was the random selection of twenty rural households in each of the selected villages. A total of one hundred and twenty (120) pieces of questionnaire were therefore administered for the collection of the data used for the study.

Methods of Data Analysis

Descriptive statistics including frequency counts and percentages were employed for the study. Other tool of analysis employed in this study is the Almost Ideals Demand System. This is specified as follows:

$$wi = \alpha i + \Sigma\gamma_{ij} \ln p_j + \beta_i \ln X + \Sigma \rho_i \ln d + \varepsilon$$

Where:

wi, = budget share for various food items consumed by the household;
α_i = average value of the budget share of food sub-group $_i$ in the absence of price and income effects
P_j = the average price of the $_j$th food class
β_i = effect of real expenditure on the budget share of food sub-group $_i$
γ_{ij} = effects of the prices of food items $_j$ on the budget share of food class $_i$
In X = logarithm of total food expenditure by household
d = vector of the independent socio-economic variables
ρ_i= effect of the socio-economic variables on the budget share of food class $_i$
ε_i = random or stochastic disturbance with zero mean and constant variance for the i^{th} food demand by household.

RESULTS AND DISCUSSION

Rural Household Food Demand

This section determines food consumption and demand patterns of rural households. The categories of food items consider in this study include cereal, legumes, root/tuber, fat/oil, fruits vegetables. The

demand for each category of food item is represented by the budget share of each of the categories as shown in Table 1.

Table 1: Budget share of Rural Households to Various food classes

Class of food	Mean	Std. Dev.
Proportion of cereals	.23138	.1497720
Proportion Legumes	.076809	.039983
Proportion Roots and Tubers	.326237	.2613857
Proportion Animal protein	.224339	.1121307
Proportion Fat and Oil	.079887	.0426191
Proportion Fruit and Veg.	.061348	.0215618

Source: Data Analysis, 2009

Table 1 shows the budget share of the various food classes in the rural household's food expenditures. Cereals, root/tubers and animal protein constitute the largest proportion of the budget share of the rural household's food expenditure. They jointly contributed about 78% of the budget share in food expenditure among the rural households in the study area. Increase in their average price may therefore lead to more than proportionate decrease in their demand.

Determinants of Rural Households' Food Demand

Household Demand for Cereals: As shown in Table 2, total food expenditure and price of tubers are the significant factor cereals consumption. Total food expenditure has positively relationship with the proportion of cereal while price of tubers have relationship with proportion of cereals in the budget share. R^2 value of 0.748 shows that about 75% of the variation in the budget share of cereals is due to specified variables.

***Household Demand for Legumes*:** Legumes are important source of protein among rural household. Items included in this category are cowpea, groundnut, soybean, and melon. Table 2 shows that price of fruit and vegetable and price of root and tubers and price of legume itself are the significant factors affecting the demand for legumes. Increases in total food expenditure and own price of legumes increase the budget share of allocated to legume. On other hand increases in the prices roots/tuber products and fruits/vegetable as well as the household income reduce the budget share of legume. R square value of 0.684 shows that about 68% of the total variation budget share of legumes is due to specified variables.

Household Demand for Roots and Tubers: Root and tubers are among the staple food items serve as cheap source of energy for rural households in Nigeria. This category includes yam, yam flour, cassava four (*Lafun*) and granulated cassava (*gari*)

As shown in Table 2, the significant factor affecting rural households demand for root and tubers include the own price of root and tubers. Others are the total food expenditure, price of cereal, and income of the household head. As shown in the Table 2, price of cereals has negative relationship with the demand for roots and tubers. On the other hand, household annual gross income, total food expenditure and its own price have positive relationships with the demand for roots and tubers. As such, increase in income, own price and total food expenditure can lead to an increase in the budget share of root and tubers. R^2 value shows that about 81% of the variation in the budget share or root/tuber is due to specified in the model.

Household Demand for Animal Product: Animal products constitute a major source of protein in Nigeria. Major food items that constitute animal products in the study area include meat, fish, egg, milk and cheese. Given their dietary importance, the factors affecting the demand for animal product among rural households in the study area are as shown in Table 2. This study shows that the

Table 2: Determinants of Rural Household Demand for Food

Variables	Cereals	Legumes	Roots/ Tubers	Animal Products	Fats/Oil	Fruits and Vegetables
Constant	-10.942***	-11.223***	-9.145 ***	-10.515***	-10.747 ***	1.045***
Total food expenditure	1.040***	1.174***	.935 ***	.660 **	.825***	.439***
Price of cereal	.372	1.313E-02	-.221**	1.871E-02	-5.946E-02	6.274E-02
Price of Legumes	1.421E-02	.457***	-0122	1.251E-03	-.145	-3.56E-02
Price of root/tubers	-0.70***	0.465**	.486 ***	-.106*	-.206 **	-.135***
Price of animal protein	-7.487E-02	-3.459E-02	-.226	410 ***	3.391E-02	5.314E-02
Price of fat and oil	-.132*	-9254E-02	-0.346	4.880E-02	.550 ***	5.098E-02
Price of fruits and vegetable	-.197E-02	-.117*	-5.473E-02	5.517E-03	9.858E-02	.348***
Age	9.538E-02	-6.284E-02	4.767E-02	-0.147	-.128	-.101
Household size	4.097E-02	-9.660E-02	.118	5.653E-02	-.160	0.115
Sex of household' head	-3.255E-02	-3.324E-02	-6.587E-02	6.396E-02	7.067E-02	-4.11E-02
Household's income	-4.790E-02	-.125*	130*	-126*	3.220E-03	7.663E-02
Education status	1.470E-02	4.725E.02	1.240E-02	-4.729E.02	-2.665E-02	3.843E-02
Main occupation	-6.542E-02	-9.989E-02	7.495E-02	1.259E-02	-.197	6.570E-02
R square	.748	0.684	0.806	.691	.544	0.601
F- value	20.788***	15.176***	29.175	15.644	8.336	10.563

Source: Data Analysis, 2009
****** parameter Significant at 1% ** parameter significant at 5% parameter significant at 10%.***

significant factors affecting the demand for animal product include total food expenditure, households' income price of animal product itself and price of root/rubber. As shown in the Table 2, total food expenditure, and own price of animal products have positive relationship with the demand for animal products. On the other hand, price of root and tubers and income have negative relationships with the demand for animal products. R^2 estimate of 0.691 implies that about 69% of the variation in budget share of animal products is due to significant variable specified in the model.

Household Demand for Fats and Oil: Fats and oil are important food items in the diet of most rural households in Nigeria. Fats and oil are generally high in calorie than most other food categories conceder in this study. Items include in this category are palm oil, vegetable oil margarine and shea better. This study shows that the factors affecting the budget share of fat and oils include total food expenditure price of root/tuber and own price of fats and oil. As shown in Table 2, only price of root/tuber has positive relationship with the budget share of fats and oil. This implies that the budget share of fats and oil would increase if the average price of the root/tubers is increased. With the R^2 value of 0.544, about 54% of the changes in the demand for fats and oil are explained by the variables specified for the study.

Household Demand for Fruit/ Vegetable: Fruits are important food items in diet as they are the major sources of vitamins. They are however low sources of calorie supply to the rural households. Major fruits consumed in the study area include mango, banana, plantain, cashew, pawpaw, and orange. As shown in Table 2, the factors affecting the demand for fruits among rural households in the study area include price of root/tuber, total expenditure as well as own price of fruit and vegetable. While own price of fruits/vegetable has negative relationship, total food expenditure and price of roots and tuber have positive relationships with the rural household demand for fruits and vegetables. An estimated R^2 value of 0.601 reveals that about 60% of the variations in the demand for fruits and vegetables are due to the variables specified in the model.

Own Price and Total Expenditure Elasticity: Elasticity measure the degree of responsiveness of variable to other factors. Price and expenditure elasticity were therefore estimated to determine the responsiveness of the demand for the various categories of food items to the significant factors affecting them in the study area. Table 3 presents the price and the expenditure elasticities of the food items in the study area.

Table 3: Price and Expenditure Elasticities of the Food Items

Food classes	Own price Elasticity	Expenditure Elasticity
Cereals	-.6140	.5632***
Legumes	.3261***	9.4070***
Roots/rubbers	-.5224***	.7316***
Animal products	-.6357***	5.7750***
Fats/Oil	-.2623***	.56120***
Fruits /Vegetable	-.4832	4.3350***

Source: Data Analysis, 2009

*** parameter significant at 1% ** parameter significant at 5%* parameter significant at 10%

This study shows that the demand for legumes in the study area does not comply with the law of demand. The positive coefficient of the elasticity of demand for legume shows that increase of 100% in the price of legumes would increase the demand for legumes by 32%. It must also be observed that price of cereals do not have any significant effect on it demand.

The magnitude of expenditure elasticity was therefore used to classify the food items used for this study either as necessities, luxury or inferior goods. With the exception of legumes which did not obey the law of demand being considered as luxury good for the fact that it had expenditure elasticity that is greater than 1, all the food items used in the study area can be described as necessity. This is so because, increase in rural households' total food expenditure leads to less than proportionate increase in their demand.

Cross Price Elasticities:

The effects of the change in the price of other commodities on the demand for a particular commodity were determined using the cross price elasticities. Based on their cross price elasticities food items were classified as substitute goods and complimentary goods. Table 3 presents the cross elasticities for food items in the study area.

Table 4: Cross Elasticities for Food Items

Food	Cereals	Legumes	Root/tuber	Animal Products	Fat/oil	Fruit /Veg
Cereals		-.2731***	-.4321***	-.3250***		.1042
Legumes	-.612***	-	-	-	.702***	
Roots/Tubers					-.230**	
Animal product			2.03***			
Fat/ Oil			5.62***			
Fruit/Veg			-3.02***			

Source: Data Analysis, 2009

Table 4 shows that legumes, root/tubers and animal protein are complimentary to cereal, while the cereal and fruits/vegetable are substitute. Also legume and cereals are complimentary, while legume and fat/oil are substitute. Furthermore roots/tuber and vegetable are complimentary. Animal product and roots/tuber as well as fat/oil and root/tuber are substitutes. Finally, the study reveals that fats/vegetable and root/tuber are complimentary. For the substitute food, increase in the price of one leads to increase in the quantity of the other purchased and vice versa. For the complementary food items, increase in the price of one leads to a reduction in the quantity of other consumed.

As shown in Table 4, 100% increase in the price of each legume root/tubers and animal product reduced the demand for cereals by about 27%, 43% and 2% respectively. On the other hand, 100% increase in the price of fruits/vegetables increases the demand for cereal by about 10%. Furthermore, 100% increase in the price of fat/oil increase the demand for legume by about 70% and increase in the price of cereal by 100% leads to decrease in the demand for root/tubers and that of animal product by about 40% and 30% respectively. Demand for fat/oil would also increase by 23% by a 100% increase in the price of root/tuber. Finally a 100% increase in the price of fruits/vegetables would also reduce the demand for roots/tubers by about 300%

Conclusion

The study shows that apart from prices, there are many other factors that influence the consumption of various food items by the rural households in Oyo State, Nigeria. As such, efforts at improving the well being of rural households in Oyo State should take cognizance of the interrelationships existing between the various classes of food items consumed by the rural households in the study area.

Recommendations

Efforts should be made of boost economic activities of this zone. This will increase their income and consequently improve their spending on the nutritious food items.

Government can as well improve their literacy level so that they would be able to identify and understand the nutritional implication of their food consumption and obtain a balanced diet from the limited available resources with them.

REFERENCES

Central Bank of Nigerian (CBN, 1996). Annual Report and Statement of Account. CBN, Abuja, Nigeria

FAO (1996) ***Special Africa Report.*** PR/96/18. Food and Agriculture 'Organization of the United National, Rome.

FAO (2003), ***FAO Methodology for the Measurement of Food Deprivation***, FAO Statistics Division, Rome.

Kormawa, P.M. (1999). ***Food Demand Structures and Market Studies for ITA Mandate Crops***: An overview", in: P. Kormawa and E. Aiyedun (eds), ***Food Demand and Market Studies in the Drier Savanna of Nigeria (*****1999).** Proceedings of a Methodological and Stakeholders' Workshop, 7-8 September, Kaduna, Nigeria.

Mbanasor, J.A. (1999). "Deregulation of Fertilizer Pricing and Distribution in Nigeria: Implications for Agricultural Development in the 21st Century"**,** In: S. Kushwaka, T.A Mbaya, S. 2002 ***HIV/AIDS and its impact on Land Issues in Malawi.*** Paper presented at the FAO/SARPN Workshop on HIV/AIDS in Laud Pretoria

National Population Commission (NPC, 2007): Official Gazette on the National and State Provisional Totals" ***2006 Census*** Federal Government Printer, Lagos, Nigeria, **24**(94):175-198

Okunmedawa, F., A. Olomola and B. Adubi (1999), Trade Liberalization and Food Security: Situation Analysis, in Nigeria. Research Report No. 17, Development Policy Centre, Ibadan.

USAID (1992). Policy Determination: determination of Food Security. *http://www.usaid.gov/pubs/ads/200/pd19.pdf*