Correlates of food insecurity status of urban households in Ibadan metropolis, Oyo state, Nigeria

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Abstract

Food insecurity is a daily reality for hundreds of millions of people around the world especially in sub-Saharan Africa. In Nigeria, the situation is alarming given the efforts made by independent, successive governments to achieve food security. This persistent food insecurity problem has been found to result mainly from unacceptably high levels of poverty, low priority for nutrition on the agenda of government and resulting poor funding. In addition, the high rate of urbanization in Nigeria has exacerbated the problem of urban food insecurity as urban dwellers contribute to an increasingly important share of the food insecure. In the light of this, the correlates of food insecurity of households in Ibadan Metropolis were examined using data collected from 150 representative households. Data obtained were analyzed employing descriptive statistics, food security index and the probit model. The estimated food insecurity line was 1948.82. Based on this, 29.3 percent of the households were classified as food insecure while 70.7 percent were classified as food secure. Econometric analysis revealed that asset ownership, tertiary educational status of the household head, household size and employment status of the household head were among the major determinants of household food insecurity in the study area. Efforts at improving urban food security should therefore take these factors into account. This could be through the targeting of vulnerable households for social protection measures that would strengthen their asset base among other measures.

Introduction

The need for adequate food intake, both in terms of quality and quantity cannot be overemphasized. This is owing to the fact that the provision of adequate and balanced food (nutrition) is necessary for the survival of the society and is fundamental for the maintenance of good health and successful execution of development plans (Okunmadewa, 2003). In matters of human well-being and economic productivity, it is also of immense importance because the economic development of a nation is dependent on its factor endowments which include the non-human and human resources, and the productivity of the human resources is a function of how well fed they are (Omonona and Agoi, 2007). These reveals the economic and political significance of food especially in issues relating to national security, maintenance of political stability, and ensuring peace and stability among the populace (Okunmadewa, 2003).

Food security, initially defined as inadequate access by all people, at all times, to food for an active and healthy lifestyle, emphasized only the availability of food. However, it was rapidly accepted that availability, though a necessary element, is not sufficient for food security, because food may be physically existent but inaccessible to those most in need. Consequently, the definition was expanded to include accessibility and utilization and is said to be achieved if adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible for and satisfactorily utilized by all individuals at all times to live a healthy and happy life (Gross *et al*., 1999).

Based on this definition, food insecurity can be said to be a daily reality for hundreds of millions of people around the world and most especially in sub-Saharan Africa. For instance, about 925 million people worldwide still suffer from chronic hunger in which 235 million hunger sufferers are from sub-Saharan Africa (FAO, 2010). Also, in West Africa, there has been very little progress in reducing food insecurity in the past 20 years (Ayodeji, 2010).

The urgent need to address this challenge led to its placement as one of the two targets of the first of the Millennium Development Goals, which is to halve the number of people who suffer from extreme hunger and whose income fall below $1 per day by 2015 (FAO 2004; 2006). The achievement of

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these targets is very important to reducing hunger. However, with less than a year to the target year of achieving this goal, available statistics still cast doubts as to whether this goal could be achieved. In Nigeria, over 53 million people, which is about 30% of the country's total population of roughly about 160 million are food insecure (Ibok, 2014). This is owing to the fact that Nigeria is a major importer of food since the current growth rate of domestic food production is unable to feed its growing population (Adama, 2016). However, efforts have been made by independent, successive governments to achieve food security in the country, through the setting up of a number of agricultural development institutions and special programmes and projects which include National Accelerated Food Production Programme (NAFPP) and Agricultural Development Project (ADP) in 1973; Operation Feed the Nation (OFN) in 1976; Green Revolution (GR) in 1979; National Fadama Development Project (NFDP) in 1992 and recently the Agricultural Transformation Agenda (ATA) in 2011, yet the food insecurity problem still persists. This persistent food insecurity problem in Nigeria (especially in the rural areas) has been linked to the non-implementation and/or faulty implementation of the National Food and Nutrition Policy and National Plan of Action for Food and Nutrition, unacceptably high levels of poverty, low priority for nutrition on the agenda of government and resulting poor funding , the poor understanding by policymakers of the content of nutrition programs in relation to other sectors and the poor performance of the Nigerian agricultural system (Oyefara, 2007; Akpan, 2009; Akinyele, 2009). This implies the poor performance of the agricultural sector and invariably food shortages and accessibility problems and by extension immense challenges in the areas of vulnerability to food insecurity.

Another fundamental issue is the fact that food insecurity has often been misconstrued as a rural problem. As a result, the focus over the years has been on rural food insecurity with most policy prescriptions focusing on rural food production and neglecting the factors that determine urban food security. However, Africa's urban population is projected to increase by 367 million and its rural population by 141 million by 2030 implying that by 2030, Africa will have a larger urban than rural population (Kessides, 2005). This has grave implications for food security in the region and requires a better understanding and support of urban food security and rural-food security linkages for successful policy prescriptions.

Further, the accelerating rate of urbanization in Nigeria has brought new challenges as more

people in urban areas imply that more food must be provided. This has exacerbated the problem of urban food insecurity as urban dwellers contribute to an increasingly important share of the food insecure. Also the high rate of unemployment in the country implies that only fractions of the people living in urban areas have a consistent source of income and cash reserves and as such are vulnerable and constrained from attaining access to sufficient and adequate foods to meet their dietary needs and food preferences for an active and healthy life (Aidoo, 2013). Of those that have a consistent source of income, a major proportion of the income is spent on food as they cannot take advantage of economies of scale by buying food in bulk, leaving next to nothing on other basic necessities. As a result, many of these households resort to coping strategies such as restricting consumption, eating fewer or smaller meals and engaging in urban agriculture which meets only a small proportion of their food needs. They are forced in the face of no alternatives, to obtain their food supplies from the marketplace. This in turn makes them vulnerable to price fluctuations, in the face of declining agricultural productivity in the country (especially in the rural areas) and consequently food insecurity, since urban areas rely on food produced in rural areas as well as imported food products.

Based on the foregoing, a focus on urban food insecurity is clearly a pre-requisite for living a healthier life, and will assist government in broadening their strategy towards achieving an acceptable level of food security. This study examined the correlates of food insecurity status of urban households in Ibadan Metropolis to further provide empirical evidence on the need to take cognizance of the urban food poor in policies, programs and interventions geared towards addressing the problem of food insecurity in Nigeria.

Materials and Methods

This study was carried out in Ibadan metropolis, the capital of Oyo state. Ibadan is located in the Southwestern region of Nigeria. It lies between Longitude 30 541 of the Greenwich Meridian and Latitude 70 541 of the equator. The city is elevated at about 234 metres above sea level and it is situated on gently rolling hills running in a Northeast/Southeast direction (Agbola and Olurin, 2000). It lies 128 km inland Northeast of Lagos and 530 km Southwest of Abuja, the Federal Capital, and is a prominent transit point between the coastal region and the areas to the North. The Ibadan metropolis consists of eleven Local Government areas with a population of 1,338,659

people according to the National population census of 2006. The mean annual temperature in the metropolis is about 26.6°C while the mean annual rainfall in the metropolis varies between 1250 mm and 1290 mm. The city is a major commercial, industrial and administrative center.

Primary data used for the study were obtained from 150 households in the area of study. Data were collected on socio-economic and demographic characteristics of the households and their food and non-food consumption expenditure. A three-stage random sampling procedure was employed in selecting the representative households. The first stage was the random selection of two Local Government Areas (LGAs) in Ibadan metropolis. The two Local Governments are Ibadan North and Ibadan Southwest. The second stage involved the random selection of 10 areas in these Local Government areas. These areas include Agbowo, Orogun, Ojoo, Challenge, Felele, Ososami, and Odo-Ona among others. In the third stage, 150 households were randomly selected from these areas.

Descriptive statistics, Food Insecurity Index and the Probit regression model were the analytical tools employed in analysis. The descriptive tools used include frequencies, percentages and tables, while the Food Insecurity index, estimated as the per-capita food expenditure of the ith household as a ratio of the two-thirds mean per capita expenditure for all households was used to classify households into their food security status. Thus, food secure households were classified as those with per capita monthly food expenditure above or equal to two-thirds of the mean per capita household food expenditure, while food insecure households were those with per capita food expenditure below two-thirds of the mean per capita monthly food expenditure.

$$F_i = \frac{\text{per capita food expenditure for the ith household}}{\text{⅔ mean per capita food expenditure of all households}}$$

Where F_i = Food Insecurity Index (when $F_i \geq 1$ = food secure ith household, $F_i < 1$ = food insecure ith household)

The Probit regression model was used to examine the correlates of food insecurity status of urban households in Ibadan Metropolis. The independent variables which are the socio-economic and demographic variables that influence food insecurity status of households included in the model are defined as follows:

X_1 = Gender of household head; (D=1 if male and 0 if otherwise)

X_2 = Age of household head (in years)

X_3 = Age squared (in years)

X_4 = Marital status of household head; (D=1 if married and 0 if otherwise)

X_5 = Primary education of household head; (D=1 if yes and 0 if otherwise)

X_6 = Secondary education of household head; (D=1 if yes and 0 if otherwise)

X_7 = Tertiary education of household head; (D=1 if yes and 0 if otherwise)

X_8 = Household size (number)

X_9 = Household head occupation; (D=1 if wage earner and 0 if otherwise)

X_{10} = Access to credit (D=1 if formal and 0 if otherwise)

X_{11} = Dependency ratio

X_{12} = Access to remittance; (D=1 if yes and 0 if otherwise)

X_{13} = Asset ownership; (D=1 if yes and 0 if otherwise)

The probit model

The probit model is given as:

$$\Pr(Y = 1 \mid X) = \Phi(X'\beta),$$

where Pr denotes probability, and Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution. The parameters β are typically estimated by maximum likelihood. The model is stated explicitly as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots \beta_{13} X_{13} + \mu_i$$

Where

Y = Food Insecurity status; (D=1 if food insecure, 0 if otherwise)

β_0 = Intercept

β_i = Regression coefficients

X_i = Explanatory variables $(X_1 - X_{13})$

μ_i = Error term

Results and Discussion

Socioeconomic characteristics of the households

Table 1 presents the summary of the distribution of rural households by selected socioeconomic characteristics. The household socioeconomic characteristics examined were age, household size, gender, educational status, occupational status, marital status and access to credit. Results revealed that majority of the household heads were male and between the ages of 30 and 70 years with only a few above 70 years of age. The average age of the household heads stood at 45.0±11.5 years, implying that majority of the respondents were still in their

Table 1. Distribution of households by socioeconomic
characteristics

Variables	Frequency	Percentage
Age:		
<30	20	13.3
30-49	87	58.0
50-69	41	27.3
≥70	2	1.3
Gender:		
Male	111	74.0
Female	39	26.0
Marital status:		
Married	104	69.3
Single	39	26.0
Widowed	7	4.7
Educational status:		
No formal education	10	6.7
Primary	13	8.7
Secondary	35	23.3
Tertiary	92	61.3
Occupational status:		
Non-wage earners	57	38.0
Wage earners	93	62.0
Household size:		
1-4	59	39.3
5-8	77	51.3
>8	14	9.3
Access to credit:		
Informal	113	75.3
Formal	37	24.7
Total	150	100.0

Source: Field Survey, 2015

Table 2. Food insecurity profile of respondents by
selected socioeconomic variables

Variables	Incidence (F_0)	Depth (F_1)	Severity (F_2)
Gender:			
Male	0.30	0.12	0.06
Female	0.28	0.10	0.05
Marital status:			
Single	0.38	0.19	0.10
Married	0.24	0.08	0.04
Widowed	0.57	0.22	0.11
Educational status:			
No formal education	0.45	0.17	0.08
Primary	0.23	0.10	0.05
Secondary	0.43	0.15	0.06
Tertiary	0.21	0.08	0.04
Occupational status:			
Non-wage earners	0.32	0.14	0.07
Wage earners	0.28	0.10	0.05
Age			
<30	0.65	0.30	0.17
30-49	0.18	0.08	0.04
50-69	0.34	0.11	0.04
>70	0.5	0.15	0.04
Household size:			
1-4	0.18	0.07	0.03
5-8	0.39	0.15	0.05
>8	0.50	0.18	0.09

Source: Field Survey, 2015

active working age. Over four-fifths of the household heads were literate with majority having tertiary education while less than one- fifths had no formal education. Further, majority of the household heads were wage earners, married with a mean household size of 5±3 members and had access to informal credit.

Food insecurity profile

The food insecurity line was estimated at ₦1948.82 employing two-thirds of the mean per capita food expenditure of the total households. Adopting the Foster, Greer and Thorbecke poverty measure, a food insecurity profile of the respondents was constructed using the three food insecurity indices; food insecurity incidence (F_0), food insecurity depth (F_1) and food insecurity severity (F_2). The distribution of households based on their food security status showed that about three-tenths (29.3%) of the households were food insecure, while more than three-fifths (70.7%) were food secure. The food insecurity status of the households was

further disaggregated by selected socioeconomic characteristics such as gender, age, marital status, occupational status, educational status, household status and household size. The resulting profile is presented in Table 2 and is discussed as follows:

The disaggregation by gender revealed that male-headed households had a slightly higher incidence of food poverty in Ibadan Metropolis when compared with their female counterparts. Also, the food insecurity depth revealed that while male-headed households would require about (₦233.86) exiting food insecurity female headed households would only require about ₦194.88. The food insecurity severity indices which measure the level of inequality in food expenditure distribution among the food insecure follow the same pattern, with female-headed households having a slightly lower food insecurity severity index than the male-headed households.

With respect to marital status, results showed that food insecurity incidence was lowest for married household heads when compared with their counterparts who were either single or widowed. The food insecurity depth indices of 0.08 and 0.22 for married and widowed household heads respectively suggests that while widowed household heads would

require ₦428.74 to exit food insecurity, married household heads on the average would require only about one-third of that amount (₦155.91) to exit food insecurity. The food insecurity severity index of 0.04 for married household heads also showed a lower level of inequality in food expenditure distribution among married households than single and widowed household heads.

The educational status profile revealed that household heads with no formal education had the highest food insecurity incidence of 0.45 and depth of 0.17. Thus, indicating that household heads with no formal education would require ₦331.30 on the average to exit food insecurity. On the other hand and as expected, household heads with tertiary education had the lowest incidence (0.21) and depth of food insecurity (0.04). Also, inequality in food expenditure distribution among household heads with no formal education was highest when compared with heads with primary, secondary or tertiary level of education attainment. Further, the occupational status analysis showed that household heads who were non-wage earners were more food insecure than their counterparts who were wage earners. The food insecurity gap and severity indices also followed the same pattern. In addition, the disaggregation by age revealed that household heads which were aged 30 years and below had the highest incidence, depth and severity of food insecurity, closely followed by household heads aged 70 years and above.

With respect to household size, food insecurity increased with increase in household size. Specifically, while households with more than eight members had the highest incidence (0.5), depth (0.18), and severity (0.09) of food insecurity, households with between one and four members had the lowest incidence (0.18), depth (0.07) and severity (0.03) of food insecurity. Household size tends to reduce per capita food expenditure although it can also enhance it depending on the distribution of household members between adults and children, and whether such adults are working. This implies that having large family size which include less income earning members reduces the per capita food expenditure of the family and consequently aggravates food insecurity in that household. This result is in line with the findings of Babatunde *et al.* (2007), Omonona and Agoi (2007) and Adepoju and Adejare (2013).

Correlates of food insecurity status of urban households in Ibadan metropolis

A Probit regression model was employed in examining the correlates of food insecurity of urban households in Ibadan Metropolis. Table 3 presents

Table 3. Correlates of food insecurity status of urban households in Ibadan metropolis

Variables	Coefficients	Z	P >/ z /
Gender	0.1308	1.61	0.107
Age	-0.0374	-0.99	0.324
Age squared	0.0003	0.81	0.420
Marital status	-0.0499	-0.26	0.794
Primary Education	-0.0516	-0.34	0.731
Secondary Education	-0.1255	-0.73	0.026
Tertiary Education	-0.1931**	-2.22	0.464
Household Size	0.1266***	4.37	0.000
Wage earner	-0.2710***	- 2.74	0.006
Credit access	-0.1053	-1.37	0.169
Dependency ratio	0.5000*	1.78	0.075
Access to remittance	-0.6776***	-2.90	0.004
Asset ownership	-0.0415**	-1.99	0.046

Source: Field Survey, 2015
***significant at 1%, ** significant at 5%, *significant at 10%
Nos of Obs=150
LR Chi² (13) =286.10
Prob > Chi²= 0.000
Log Likelihood= - 817.231

the results of the analysis and showed that tertiary education, household size and occupational status of household head (wage earners), asset ownership and access to remittances were the major correlates of food insecurity status in Ibadan Metropolis. The significant chi-squared value of 286.10 is an indication that the model has a good fit.

The negative coefficient of tertiary education of the household head connotes a negative relationship between tertiary education of the household head and food insecurity. In other words, household heads with tertiary education have a lower probability of being food insecure when compared with household heads with no formal education which is the base category. However, contrary to a priori expectations the primary and secondary education attainment variables were not significant but had the expected signs. Education is likely to confer on the head, the opportunity of being engaged in livelihood activities that will generate enough income to at least meet the basic food needs.

Similarly, the occupational status of the household head had a negative effect on household food insecurity. Specifically, households whose heads were wage-earners had a lower probability of being food insecure when compared with households whose heads were non-wage earners. This clearly shows the importance of a stable source of income to household food security in the study area as opposed to seasonal income which may predispose the households to being food insecure at particular times. The negative relationship between access to remittances and household food insecurity status implies that households with access to remittances have a lower probability of being food insecure. This could be as a result of the effect of remittances in augmenting household income which ultimately

decreases the likelihood of being food insecure. In the same vein, the coefficient of asset ownership was negative as expected indicating that household heads who own one form of assets or the other have a higher probability of being food secure than their counterparts who do not own assets especially if these assets are liquid. The sale of assets serve as a means of income generation in mitigating food related shocks.

On the other hand, the positive coefficient of household size and dependency ratio implies that larger households are more likely to be food insecure especially those with low asset and resource base as well as those with a greater number of children, elderly and disabled members who are particularly classified as vulnerable. Large family size tends to reduce the per capita income available to the household and ultimately results into lower purchasing power to obtain nutritionally adequate food. In summary, having at least secondary education, a small household size, assets, receiving remittances and earning a regular source of income are key factors to consider in tackling food insecurity among urban households in Ibadan Metropolis.

Conclusion

Generally, the worsening urban food insecurity and poverty levels in Nigeria can be linked partly to the low standard of living in the rural areas, which has driven scores of desperate people to the cities. This suggests that agricultural growth has a central role to play in addressing food insecurity. This could be through intensification of agricultural production in rural areas, especially those of smallholder farmers to improve and support availability of food in urban areas or "sustained political commitment at the highest level, with food security and nutrition as top priorities as a prerequisite for hunger eradication" (FAO, 2014). This, however, requires an integrated approach which could include: public and private investments to raise agricultural productivity; better access to inputs, land, services, technologies and markets; measures to promote rural development; social protection for the most vulnerable, including strengthening their resilience to conflicts and natural disasters; and specific nutrition programs, particularly to address micronutrient deficiencies in mothers and children under five. Hence, based on the empirical evidence emanating from this study, it is suggested that relevant policies and programs that would encourage improvement in the level of education could be put in place as this has been found to positively impact food security through

increased employment and income opportunities as well as better nutrition practices by women, social protection measures that would strengthen the asset base of households should be targeted at vulnerable households as asset ownership was found to decrease the probability of being food insecure. Lastly, since non-wage earning households were found to be more food insecure, policies that will ensure access to proper and secure employment should be of utmost priority.

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