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An Assessment of Food Security Situations of Farm Households in Nigeria: A USDA Approach

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Abstract: This study examined the food security situations of the Nigerian's major farm households using Ekiti State, Nigeria as a case study. The study comprised a random sample of 160 farm households selected across 16 villages in the 2 Agricultural Development Project (ADP) zones of Ekiti State. The USDA approach for the analysis of farm household food security was used to measure the intensity of food severity among the farm households. Results showed that only 12.2% of the farm households were food secure, 43.6% were food insecure without Hunger, 35.9% were food insecure with Hunger (moderate) and 8.3% were food insecure with Hunger (severe). Cassava, yam and their products were shown to contribute immensely to the food security status of the farm households. Constraints faced by farm households in the production of major staple crops were mainly those of high cost of transportation, poor receipts from farm output sales, inadequate storage facilities for yam and inadequate processing facilities for cassava. The study therefore recommends among other things that credit and or subsidy should be made available to farmers.

Key words: Food security, food insecurity, farm household, cassava, yam

INTRODUCTION

Food insecurity remains a fundamental challenge in Nigeria. The Food and Agricultural Organisation (2002) enlisted the country among countries faced with serious food insecurity problems. The vision of Nigeria to have physical and economic access to food on a continuous basis has therefore continued to remain a mirage (Adeyeye, 1997). As at 1986, about 14 million (16%) Nigerians were food insecure with majority being peasant farming households (Abalu, 1990). Over 40% of households across all agro-ecological zones in Nigeria face the problem of severe food insecurity (Mariya-dixton *et al*., 2004).

A crucial issue in the development of a nation is the availability of food for the populace. Hence, food security becomes important in any consideration of the sustainability of the wealth of a nation (Osundare, 1999). Being a critical factor of economic growth and development of a nation, food security has involved a global concern that calls for the need to evolve strategies that are workable and sustainable for minimizing or possibly eliminating the obstacles against full realization of universal food security (Onyido, 1997). In the light of this, a foremost step towards remedying any food security problem would be to examine its characteristics nature among those affected. However, the concept of food insecurity is complex and goes beyond the simplistic idea of a country's inability to feed its population. The main dimensions of food security in individual countries have not been subjected to serious analysis. In Nigeria, common approaches used to assess food security situations involve the use of bench mark food security requirements. For instance in a study on food security, Olayemi (1998) gave the threshold for food security as the ability of the household to meet 2260 kcal of energy and 65 g of crude protein per capita. In their own view, Joseph and Ajayi (2002) indicated that the recommended minimum nutrient requirement to be consumed per day per capita includes the 2191 kcal and 65-86 g crude protein out of which at least 35 g or 40% must be animal protein. Accordingly, the bench mark food security requirements approaches either classify a household as either a food secure or a food insecure household. However, these methods fail to examine the extent of the severity of food insecurity among households. Therefore, a more intensive approach for food security assessment is necessitated. This study adopts such an approach: The USDA (2000)

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approach for the analysis of farm household food security. The study, specifically examined the socio-economic profile of farm households and their food security conditions.

The study is focused on the rural households/farm households. This is because a sizeable proportion of Nigeria's population resides within the rural areas. In spite, of the invasion of the urban sector by rural and semi-rural population, about 70% Nigerians depend on agriculture and live in the rural areas (Okolocha, 1993; Abdullahi, 2002). Also, the bulk of those suffering from food insecurity remain in the rural areas (Fresco, 2000).

This study assumes sizeable importance since knowledge drawn from the study could enhance the formulation of sound macro and micro policies necessary for the emergence of sustainable food security policies. It could also indicate those key variables (areas) that could be managed to better the food security status of the majority of the Nigerian populace who are mainly agrarian.

MATERIALS AND METHODS

The study area and data collection: The study area, which is Ekiti State has been divided into 2 zones by the Ekiti State Agricultural Development Project (EKSADP) on the basis of cultural and ecological characteristics and administrative convenience of the state. These zones are the Northern and Southern EKSADP zones. The study sample was therefore, spread across the 2 EKSADP zones. The sampling technique adopted comprised a 2 stage sampling procedure. The first stage involved the random selection of eight villages per EKSADP zone. The second stage comprised the random selection of 10 farming households per selected village, making a total of 160 respondent farm households for the study. The sampling design for the study is as presented in Table 1.

Table 1: Study sampling design outlay showing the spread of respondent across the study area

ADP zone	Name of villages	Number of respondents
Northern	Epe	10
	Iro	10
	Oyun	10
	Ikosu	10
	Edadoniyo	10
	Iye	10
	Iludin	10
	Ijesa-modu	10
Southern	Agbado	10
	Aisegba	10
	Iluomoba	10
	Ijan	10
	Odo-Ayedun	10
	Oke-Ayedun	10
	Iyemero	10
	Odo-oso	10
Total		160

Source: Field survey (2006)

Analytical technique: This study adopts the USDA approach for the analysis of farm household food security in the study area. The USDA method categorizes households using a constructed food security scale. This scale is a number continuum in a linear scale that ranges between 0 and 10. The scale measures the degree of food insecurity/hunger experienced by a household in terms of a single numerical value. The procedure that determines a household scale fundamentally depends on the household responses to some structured survey questions (These questions are presented in Table 2). For instance, a household with a scale value of 6, has responded affirmatively to more questions that are indicators of food insecurity than for a household with a scale value of 3. A household that has not experienced any of the conditions of food insecurity covered by the core questions will be assigned a scale value of 0, while a household that has experienced all of them will be scored scale values close to 10. In general, the set of questions works symmetrically together to provide a measurement tool for identifying, with considerable sensitivity, the level of food insecurity/hunger experienced in a household.

Coding survey responses for food security scale: Each household's location on the food security continuum is assessed by their response to series of questions about behaviours and experiences known to characterize households having difficulty meeting their food needs. To do this, it is first necessary to code their response to each of questions 1-16 in Table 2 as either affirmative or negative. Questions 1-16 in Table 2 has three response categories often true, sometimes true and never true. For these questions both often true and sometimes true are considered as affirmative responses because they indicate that the condition occurred at some time during the year of the study. The distinction between the often true and sometimes true is therefore not used in the scale.

In determining the household food security status on the food security scale, the food security scale is first simplified into a small set of categories as in Fig. 1. Four categories can be defined for this purpose. These include:

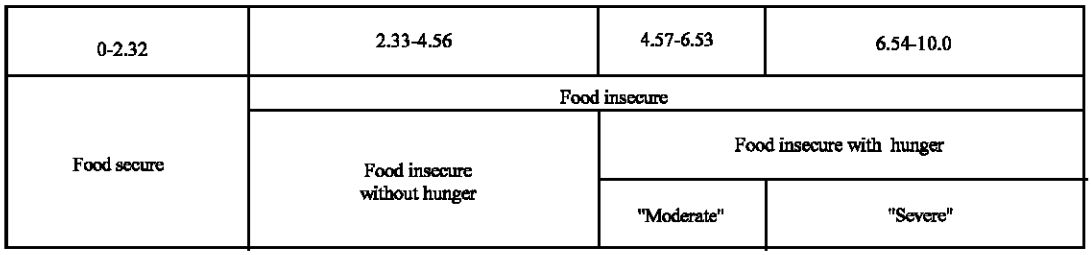
Food secure households: These are households that show zero or minimal evidence of food insecurity. The group's value ranges between 0-2.32 on the food security scale.

Food insecure without hunger households: These groups show concern about the adequacy of the household food supply. They therefore show adjustments in their daily food management. This group's value ranges from 2.33-4.56 on the food security scale.

Table 2: Structured survey questions on food security of the household

Question	Response		
	Often true	Sometimes true	Never true
Do you worry if your food stock will run out before you get another to eat?			
Do you have enough resource to acquire enough food?			
Could you afford to eat balanced meals?			
Do you supplement your children's feed with low cost foods?			
Can you afford to feed your children balance meals?			
Were your children not eating enough because you couldn't afford enough food?			
Do adults in your household skip meals or cut the size of their usual meals?			
Do you eat less than you feel you should?			
Were you ever hungry but didn't eat?			
Did you loose weight because there wasn't enough food to eat?			
Did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?			
How often did this happen?			
Did you ever cut the size of any of your children's meal because there wasn't enough money for food?			
Did any of the children ever skip meals because there wasn't enough food to eat?			
Did any of the children ever not eat for a whole day?			
Were the children ever hungry but you just couldn't afford more food?			

All questions (1-16) covered the last 12.months period. September 2005- August, 2006; Source: Adapted from USDA



Source: Adapted from USDA

Fig. 1: Household food security status

Food insecure with hunger (moderate) households: These groups of households have their food intake reduced such that the household adults have repeatedly experienced the physical sensation of hunger. The group's value is between 4.57-6.53 on the scale.

Food insecure with hunger (severe) household: Households in this group have their children's food intake reduced to an extent that the children have experienced hunger. The group's value on the food security scale ranges between 6.54-10.0.

During the study the farm household daily consumption of food items was also examined using Eq (1). The estimate was used as a proxy of the contribution of each food item to the farm household daily food consumption.

$$\text{Farm household daily food consumption} = \frac{\text{quantity of ith food item}}{\sum \text{quantity of food items}} \times 100\% \quad (1)$$

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents: Most of the farm respondents' households the study area are headed by married men. These households consisted of 6 members on average with a standard deviation of 3 members. The household heads were aged with a mean age of 41 years and a standard deviation of 16 years. Agriculture serves as the household's major occupation making up 71.8% of their occupation. Over three-quarters of the household heads are literate through 1 form of education or the other. Few of them have no formal education. The result also indicates an estimated mean annual income per household of N72000.00 ($7150). (Table 3).

Cropping practices and land use: The greater percentage of the farm household respondents (63.2) practiced mixed cropping. A considerable number (21.8) also practiced sole cropping, Few (11.5%) practiced mixed farming, while the remaining few (4.50%) practiced both sole and mixed cropping. Most households cultivated yam and cassava, which were usually intercropped with other crops like

Table 3: Socio-economic characteristic of respondents

Characteristics	Frequency	(%)
Gender of households head		
*Male	136	87.2
*Female	20	12.8
Total	156	100.0
Age of household head		
*20-29	2	1.3
*30-39	26	16.7
*40-49	42	26.9
*50-59	33	21.2
*60-69	34	21.8
*70-79	17	10.8
*80-Above	2	2.3
Total	156	100.0
Marital status of household head		
*Single	5	3.2
*Married	120	82.7
*Widow	12	7.7
*Widower	8	3.8
*Divorce	4	2.6
Total	156	100.0
Household size		
*1-5	75	48.1
*6-10	80	51.3
*11-15	1	0.6
Total	156	100.0
Household head agricultural		
Employment status		
*Major	112	71.8
*Minor	44	28.2
Total	156	100.0
Annual Income($1 equals $127)		
*<N20,000	2	0.6
*N20,000-39,999	24	15.4
*N40,000-59,999	47	30.3
*N60,000-79,999	24	15.4
*N80,000-99,999	7	4.5
*N100,000-Above	52	33.5
Total	156	100.0
Age category of household		
*Male child	32	3.8
*Female child	56	6.6
*Male youth	74	8.7
*Female youth	89	10.5
*Male adult	3.2	35.6
*Female adult	295	34.8
Total	848	100.0

Source: Results based on data analysis

Table: 4: Cropping practices and land use pattern by respondents

Characteristics	Frequency	(%)
Agricultural practice		
*Sole cropping	34	21.8
*Mixed cropping	97	63.2
*Mixed/sole cropping	7	4.5
*Mixed farming	18	11.5
Total	156	100.0
Land area cultivated (ha)		
<1 ha	48	30.6
*1-2 ha	66	42.3
*3-4 ha	38	24.4
*5-6 ha	4	2.6
Total	156	100.0
Land area for yam (ha)		
<1.0 ha	101	64.8
*1-2 ha	47	30.1
*3-4 ha	8	5.1
*5-6 ha	-	-
Total	156	100.0
Land area for cassava (ha)		
*<1.0 ha	73	46.8
*1-2 ha	64	41.1
*3-4 ha	18	11.5
*5-6 ha	1	0.6
Total	156	100:00.0

Source: Results based on data analysis

maize, guinea corn and vegetables. Other crops cultivated in the study area were cocoa, kola nut and rice. This result implies that most farm households in the study area cultivate yam and cassava (Table 4). This result concurs with Hahn (1994), which showed that the root and tuber crops especially yam and cassava are crops that farmers are already very familiar with, offering several ideal qualities as crop for food security. These crops account for over 50% of total world's staples production and serves as the backbone of African tropical economy.

Food security status of farm household: Based on the food security analysis results, derived using the USDA (2000) approach earlier described. Few of the respondents' households (12.2%) are food secure, while most of them (87.8%) are food insecure at different level of food insecurity (Table 5). These results do not agree with those of Abalu (1999) and Mariya-dixton *et al.* (2004), which indicated that 84 and 60% of the country's households, respectively were food secured, while only 16 and 40%, respectively of Nigerian households are food insecure.

Crops contributions to farm household food security: The daily household food consumption of the respondents' households consists mainly of yam, cassava and their products, which make up (69.6%) of the total food consumption from both household own food production and food purchases (Table 6). This implies that a deficit in the availability of popular roots and tubers like yam, cassava and their products in the area could mean serious food insecurity problems for the household. According to FAO (1990, 2002), considering the situation in Nigeria, important staples like the roots and tubers have many advantages as food crops for household food security, with cassava as possibly the most significant.

Constraints to major staple crops production: The problems faced by respondents in the production of major staples like yam and cassava were mainly those of transportation. About half (55.5%) of the respondents are faced with the problems of high transport costs. The other respondents were faced with problems of poor storage facilities for their yam (19.5%) and inadequate processing

Table 5: Food security classes of farm households

X food security status	Frequency	(%)
Food Secure FS	19	12.20
Food Insecure without Hunger FISWH	68	43.60
Food Insecure with Hunger (Moderate) FISWHS	56	35.90
Food Insecure with Hunger (severe) FISWHS	13	8.30
Total	156	100.00

Source: Results based on data analysis

Table 6: Farm households daily food consumption

Food items	(%)
Yam	51.90
Yam flour	3.50
Cassava flour	5.30
Garri	6.90
Rice	8.90
Maize	5.20
Beans	7.40
Meat/fish/products	5.50
Others	6.40
Total	100.00

Source: Results based on data analysis

Table 7: Production constraints of major staples crops producers

Problems	Frequency	(%)
Transport	87	55.50
Inadequate storage facilities	30	19.40
Inadequate processing facilities	31	20.10
Poor receipts	8	5.00
Total	156	100.00

Source: Results based on data analysis

facilities for cassava (20.5%), while few are faced with poor receipts from the sales of their crops (Table 7). The later problem was reported to limit the respondents' income.

CONCLUSION

The belief that majority of households in Nigeria are not faced with serious food insecurity problems is an erroneous one. Most of the nation's households are farmers in her rural areas who are food insecure measuring high on the food insecurity scale. This is evidenced by the food security categories of farm households in this study. It is also shown that staple crops especially cassava and yam play crucial role in the food security drive of rural households. In line with the study findings therefore, there is an urgent need to remedy food insecurity problems in the rural areas of Nigeria. Along this line, the agricultural potentials in these rural areas should be rejuvenated. The production of major staples advocated to provide the population with the nationally-required food security minimum threshold of 2400 calories per person per day should be encouraged. Such efforts according to the Food and Agricultural Organization FAO, serve as remedy to national food security problems.

Farmers should be encouraged to produce important staples especially the roots and tuber crops like yam and cassava. Funds in the form of credit loans and subsidy on farm inputs/outputs like fertilizer should be given to these farmers so as to make the production of these major staples a profitable venture. Adequate storage and processing facilities should also be provided to farmers to enhance the availability of these staples especially during their off-season periods. In addition, there is a need for the promotion and facilitation of the establishment of viable cooperatives that could help furnish farmers with input incentives, as well as the provision of the necessary support to these cooperatives when formed. These cooperative could collectively own traditional yam storage bans and cassava processing plants for the benefits of their members. Cooperative leaders should also be involved on the fertilizer procurement and distribution committees, particularly at the grass-root, ward or Local Government Area levels in order to enhance the prompt supply of fertilizers as at when due.

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