



### ASSESSMENT OF THE ROLE OF FAO IN INCREASING FOOD SECURITY AMONG FOOD CROP FARMERS IN JERE LGA BORNO STATE, NIGERIA

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#### **ABSTRACT**

This study assessed the role of FAO in increasing food security among food crop farmers in Jere LGA of Borno State, Nigeria. Multi stage random sampling was used in drawing 100 respondents for this study. Information was collected using structured questionnaire. Both descriptive and inferential statistics were used to analyzed data for this study; descriptive statistics in the form of frequencies, mean and percentages and food security index were used, inferential statistics in the form of logit regression was also used. Male dominated food crop production with (66%). Majority (34%) of the food crop farmers in Jere LGA were between the age bracket of (41-50) years. Overwhelming majority of (81%) were married, and majority of (60%) had household members between (5-8) persons. The level of education was very poor as majority of (42%) had no formal education. The contribution of FAO in increasing the food security among crop farmers in Jere LGA were (assisting in diversifying livelihood 96%, farmer field school 89%), distribution of seeds, 87%). The food security status of the food crop farmers was (65%) were food secure. The logistic regression model was used to examine the socioeconomic characteristics on food security. The results revealed that 9 out of 10 variables included in the model were significant at (5% or 1%). The significant variable at 5% were age, household size, education, farm size, farming experience, access to credit, access to extension service, while marital status, income and access to credit were significant at 1%. The value of R<sup>2</sup> that the model explains that 54.7% variation in the data. Government should support FAO in order to ensure that food crop farmers have access to improved farm input such as seed, fertilizers, and others, gets to food crop farmers easily. Large household sizes and farm size were found affect food security level in the study area. Therefore, policy measures were directed towards the provision of better family planning, increased awareness and access to family planning facilities should give adequate attention and priority by government. In view of this, strategies for an effective community participation in design of concept and messages aimed at imparting knowledge about family planning to households are recommended.

Keywords: Food security, Crop farmers, Multi-stage, Borno State, Nigeria.

#### INTRODUCTION

Agriculture has been the backbone of the economy in Nigeria, providing employment and source of livelihood for the increasing population. It accounted for the half of the Gross Domestic product (GDP) of the Nigeria economy at independence in 1960 (Balogun, 2000: Olagunju, 2004). However, the role it plays in the Nigeria and economic development of the country has diminished over the years due to the dominant role of crude oil sector in the economy and in the Gross Domestic product aggregate share. In spite of this, the sector accounts for about 40 percent of GDP and provides employment, both formal and informal for about 60 percent of Nigerians 144 million people (Digbokar, 2001; Onyeahialam, 2002; Dagunju 2007). National Agricultural economy and policy Report; 2009; Odoemation, 2011).





Food crop production is essential for the well-being of humanity, but the frequently changing global environmental conditions pose a serious threat to crop production due to the unexpected occurrence of biotic and abiotic stress variables, which cause considerable crop loss and thus challenge global food security. Affordability of food should be one of the key objectives of any economy as survival of human beings, who in turn pilots every other aspect of the economy even in the face of increasing automation, depends on food availability. In fact, the continued well-being of human society significantly depends on availability and affordability of food for their consumption.

Food crop production in Nigeria dates back to the dark ages when life was characterized by subsistence farming and hunting for survival. Then, farmers were mainly producing for their household consumption using the manual farming techniques. The colonial period, however, improved the agricultural system in the country by introducing mechanization of food production, hybrid seedlings, the use of fertilizers, and research to improve food production. The Department of Botanical Research was the pioneer research institute, established in 1893 with its headquarters at Olokomeji (former Western Nigeria), and followed by the creation of the Moor Plantation in Ibadan in 1905. The Moor Plantation later became the headquarters of the Department of Agriculture of Southern Nigeria in 1910, while the Department of Agriculture was established in the North in 1912. By 1921, a unified Department of Agriculture was formed in Nigeria, after the amalgamation of the North and the South (Kanu, 2013). The colonial era was characterized by the creation of irrigation schemes, agricultural skill centers, plantations, as well as an association of farmers that saw the production of cash crops that were geared for exports.

The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger. Its goal is to achieve food security for all and make sure that people have regular access to enough high-quality food to lead active, healthy lives. FAO's assistance in Nigeria focuses on some broad priority areas: Improvement in national food and nutrition security; Support for agricultural policy and regulatory framework; Support to the Agricultural Transformation Agenda for priority value chains and promote decent employment for youth and women, increasing agricultural productivity and creating an enabling environment for increased market access; Sustainable management of natural resources; Improved disaster risk reduction and emergency management (FAO, 2012).

Food security as a concept originated only in the mid-1970s, in the discussions of international food problems at a time of global food crisis. The initial focus of attention was primarily on food supply problems - of assuring the availability and to some degree the price stability of basic foodstuffs at the international and national level. That supply-side, international and institutional set of concerns reflected the changing organization of the global food economy that had precipitated the crisis. A process of international negotiation followed, leading to the World Food Conference of 1974, and a new set of institutional arrangements covering information, resources for promoting food security and forums for dialogue on policy issues.

The issues of famine, hunger and food crisis were also being extensively examined, following the events of the mid-1970s. The outcome was a redefinition of food security, which recognized that the behavior of potentially vulnerable and affected people was a critical aspect. A third, perhaps crucially important, factor in modifying views of food security was the evidence that the technical successes of the Green Revolution did not automatically and rapidly lead to dramatic reductions in poverty and levels of malnutrition. These problems were recognized as the result of lack of effective demand in Borno State, located in the north-east of





Nigeria, has been transformed from a dynamic and populated rural area into a zone of displacement, hazards and food insecurity as the result of escalating levels of violence. Since 2009, the conflict in north-eastern Nigeria has devastated agricultural livelihoods in various ways, including livestock losses; reduced access to fishing grounds; destruction of irrigation and farming facilities; and the collapse of extension services and key agriculture-based value chains. Losses have been caused by levies imposed by Boko Haram on transported production, market and trade facilities (including fish markets); and by reduced production owing to mass displacement and limited access to markets (FAO, WFP and UN Women, 2018).

Attaining food security in its entirety poses a huge challenge in a country like Nigeria, as a result of a wide spectrum of problems. More than 90 per cent of agricultural production in Nigeria is rain-fed with about 79 million hectares of arable land, of which 32 million hectares are cultivated (Nwajiuba, 2012, cited in FAO, 2012). Both crop and livestock production remain below potentials. Despite a seven percent growth rate in agricultural production (2000 to 2008), the growing population is dependent on imported staple food (rice, beans) exemplified by increase in food import bill.

First and foremost, the primary cause of food insecurity in developing countries is the inability of people to gain access to food due to widespread poverty and unemployment, which also inhibits purchasing power and prevents assured access to food supplies.

Secondly, global food prices have risen dramatically in the last few years and are forecast to rise further or become more volatile (IAASTD, 2009, Nelson *et al*, 2011, cited in, FAO, 2011). Food price volatility has exerted considerable pressure on global food security, and many Nigerians depend on market for their food supply and vulnerable to high food prices. Related to high food prices is a high cost of input which limit yield and production levels that many time lead to sub-optimal input utilization. For instance, fertilizer consumption in Nigeria is one of the lowest in sub-Sahara Africa at 7lg per hectare (Abu, 2012, cited in, FAO, 2012).

Thirdly, the inherent characteristics of climate that manifest themselves as changes of climate over a period time affect food security significantly in unpredictable ways as a result of their detrimental effect on pests, crops diseases, crop production, animal husbandry, and humans.

Fourth, farmers in Nigeria also have limited access to credit, and less than 10 per cent of irrigable land is being irrigated. Fifth, the global economy is knowledge-driven and food system efficiency is dependent heavily and directly on agricultural technological innovations and innovations in relevant sectors. Nigeria's adult literacy level is 54.5 per cent (NBS, 2009). However, the rural poor who are the active stakeholders in food availability account for 33.4 percent and are mainly involved in subsistence farming.

At the production stage, certain factors affect the quantities and types of food produced. Likewise, food security activities like land clearing, crop production, animal husbandry, food processing and preservation and food distribution which lead to the production and release of GHC (such as carbon dioxide, methane, and nitrous oxide) cause global warming and impact on climate change. The main objective of this study is to determine the extent of the role of Food and Agriculture Organization (FAO) in increasing Agricultural production in Jere LGA of Borno state, Nigeria. The specific objective deals with the purpose of research work, these objectives include:

- i. to determine the socio-economic characteristics of the food crop farmers in the study area,
- ii. to examine the contribution of FAO in increasing food security;
- iii. to determine the food security status; and



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iv. to examine the influence of socio-economic characteristics on food.

#### **MATERIALS AND METHODS**

Jere Local Government is one of the 27 Local Government Area of Borno State. Jere Local government has aheadquarter at Khaddamari and consist of 10 wards like: Dala, Lawanti, Dusuman, Gamboru, Gomari, Gongulong, Jere, Koshebe, Maimusari, and Mairi. It is the one of the sixteen local government that constitute the Borno emirate. A traditional Area located in Borno State, Nigeria. The study area is characterized with two marked seasons which consist of the dry season and rainy seasons. Dry season lasting from November to March and rainfall is usually 500mm in Maiduguri, with the temperature between 20 degrees Celsius to 34 degrees Celsius. Mixed crop and livestock production constitute a major agricultural and economic activities in the area which include many crop species like: Sorghum, Maize, Rice, Groundnut, Cowpea, Soybeans and Vegetables. The animals kept are: Cattles, Sheep, Goats and Poultry.

Jere Local Government Area stands as headquarter for the administrative governance. The rainfall is highly seasonal with wet to dry season, also harmattan is experienced all over the area. Deforestation comes as a result of interference by man and animals through cultivations, constructions of houses, feeder roads and exploitation of houses. Although the people of the study are engaged in other economic activities like trading, but the predominant and prominent occupation of the people of the study area is farming. The climatic condition favors the cultivation of food and cash crops such as: Beans, Groundnut, Cottons and Fruit Tree. For this research, both primary and secondary data will be use to obtain information. Primary data will be obtain using structured questionnaire, while the secondary data will be obtained from textbook, journals, internet, conference proceedings, FAO publication (both published and non-published) as well as other relevant publications. Both inferential and descriptive statistics are going to be employed for this study. Descriptive statistics in the form of mean, percentages, frequencies are going to be use to analyses objective I and ii, food security index is going to be use to achieve objective iii. Inferential statistics in the form of logit regression model is going to be use to achieve objective iv.

We also modeled the determinants of food insecurity of households. For the determinants of household food insecurity, it was assessed using Logit regression model, which is presented as follows:

$$I_{i} = b_{0} + \sum_{j=1}^{n} b_{j} X_{ji}$$
 -----(2)  
 $Y_{i} = g(I_{i})$  ----(1)  
where:

 $Y_i$  is the observed response for the ith observation (i.e., the binary variable,  $Y_i$  =1 for a food secure household and Yi=0 for food in secure household).  $I_i$  is an underlying and unobserved stimulus index for the ith observation (conceptually, there is a critical threshold ( $I_i^*$ ) for each household; if  $I_i < I_i^*$  the household is observed to be food insecure, if  $I_i \ge I_i^*$  the household is observed to be food secure). g is the functional relationship between the field observations ( $Y_i$ ) and the stimulus index ( $I_i$ ) which determines the probability of being food secure.

The logit model assumes that the underlying stimulus index  $(I_i^*)$  is a random variable, which predicts the probability of being food secure. Therefore, for the ith observation (a household):





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The relative effect of each explanatory variable  $(X_{ji})$  on the probability of being food secure is measured by differentiating with respect to  $X_{ji}$ , using the quotient rule:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 \dots \beta_{10} x_{10} + e, \qquad \dots (5)$$

where;

Y= Role of FAO in increasing food security status

X= Independent variables

 $\beta_0$ = estimated co-efficient

e = error term

 $X_1 = Age (years)$ 

 $X_2 = Sex - Male (1)$ , Female (0)

 $X_3$ = Marital Status (Married= 1, 0 Otherwise)

 $X_4$ = Farm Income ( $\mathbb{N}$ )

 $X_5$ = Farm size (Ha)

 $X_6$ = Educational Status (years spent in school)

X<sub>7</sub>= Household size (Number)

 $X_8$ = Farming experience (years)

X<sub>9</sub>= Yield/ha (kg)

 $X_{10}$ = Access to credit (Access 1 = Otherwise= 0)

#### **RESULTS AND DISCUSSION**

The results of the socioeconomic characteristics of the respondents are presented in Table 1. From the Table 1 reveals that 66% of the households were head by males while (34%) were headed by females. The implication of the results was that males headed more household than the females in the study area and that males take farming seriously than the females because of the family burden upon them. This is consistent with the position of Adoeti (2006), who reported that more men were found in farming than women. From Table 1, this research discovered that majority of the respondents (34%) were between the age bracket of 41-50 years (middle age) which is an active age for farming and trading. This implies that the respondents were young adults full of strength, agility and can utilize these features to ensure food security. Marital status of the respondents is presented in Table 1 above and was discovered that (81%) of the farmers were married. This further justify that married individuals take food production with high level of seriousness because of fairly responsibility such as feeding, clothing, shelter and probably raise family labor.





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**Table 1:** Socio-economic Characteristics of the Respondents

Socio-economic Variables	Frequency	Percentage
Sex		
Male	66	66.0
Female	34	34.0
Age (Numbers)		
<20	3	3.0
20-30	22	22.0
31-40	23	23.0
41-50	34	34.0
51-60	10	10.0
>60	8	8.0
Marital Status		
Married	81	81.0
Single	12	12.0
Divorced	7	7.0
Household Size (Numbers)	,	7.0
<5	23	23.0
5—8	60	60.0
9—12	17	17.0
Years In Education (Years Spent In School)	1 /	17.0
None	42	42.0
	28	28.0
1—6 (Primary)	28	23.0
7—12 (Secondary)	23 7	7.0
>13 (Higher Institution)	1	7.0
Farm Size (ha)	24	24.0
<5	34	34.0
5—8	24	24.0
9—12	13	13.0
13—16	25	25.0
>17	4	4.0
Income (Naira)		
<50000	9	9.0
50000-70000	37	37.0
71000-100000	31	31.0
>100000	23	23.0
Farming Experience (Years)		
<4	12	12.0
4—8	34	34.0
9—12	45	45.0
>12	9	9.0
Access To Extension Service		0.0
Yes	83	83.0
No	17	17.0
Access To Credit		
Yes	62	62.0
No	38	8.0

Source: Field Survey (2021)

The household size of the respondents is presented in Table 1. About 60% of the respondents had a household size of 5-8 while (23%) had a household size of <5 and about





(17%) had a family size 9-12. This shows that most of the household had access to labor, but as the household size increases, the household tend to be food insecure especially where there are children/depends and elderly people in the family. This agrees with the position of Omotesho *et al.* (2007), who stated that a household tend to be poor as its size increases. The years spent in school was presented in the Table 1. Majority of the respondents (28%) had (1-6) i.e primary education, (23%) had secondary education and (42%) didn't attend western education. This means that majority of the respondents were not educated and this could constitute a big challenge to the reception and adoption of modern farming techniques that can lead to improved food security. The low level of education could also limit opportunity for better off-farm jobs. This was also a proposition of Babatunde *et al.* (2007). Farm size is presented in Table 1 and it was discovered that majority of the respondents (34%) had <5 ha, (24%) had 5-8 ha, (13%) had 9-12 ha and (25%) had 13-16 ha. These figures clearly explain that the farm of the respondent was small and fragmented which will not ensure adequate food availability.

Majority of the respondents (37%) earn 50,000-70,000 naira, (31%) earn 71,000-100,000 naira. The implication of this income was that because of the fragmented farmland, the income reduced. This will not ensure food security in the study area. Majority of the respondents (45%) had 9-12 years of farming activities, (34%) had 4-8 years, (12%) had >4 years and (9%) had >12 years. This implies that majority had fairly satisfactory experience that could enable them unfold the new innovation given to them by FAO. Majority of the respondents (83%) meet contact with FAO and other extension agencies. The implication of these findings was that majority could have access to necessary technical assistance, input and can ask question for further clarification. Majority of the respondents (62%) had access to credit. This justifies that majority had access to credit by FAO, that disbursed cash to the respondents. This means that they can use the cash to improve and increase their yield productivity and production in other to secure more food.

#### **Contribution of FAO in Increasing Food Security**

The contribution of FAO in increasing food security through the following activities: distribution of seeds, distribution of inorganic fertilizer, distribution of simple farm tools, market linkage, provision of animal ox plough for land clearing, farmer field school, assisting in diversifying livelihood and food crop value addition were presented in Table 2.

The contribution of FAO to food (food availability) is discussed in Table 2. It was gathered that FAO assists Jere LGA in the adequate provision of; seeds (87%), inorganic fertilizer (79%), simple farm tools (67%), market linkage (85%). From these figures, it can be deduced that FAO disbursed seeds in order to ensure increased productivity; (87%) of the respondents attested to that. FAO distributed inorganic fertilizer to augment the depleted soil in order to increase food availability, this was attested by (79%) of the respondents' responses. in order for the respondents to have adequate input to enable them partake in food crop production, simple farm tools were distributed to them and was attested by (67%). In other words, /put differently (67%) of the respondents accepted that they received simple farm tools from FAO. For the respondents to have value for their product, FAO trained them on marketability of their product and link them appropriately, (85%) of the respondents accepted to have benefited. Consequently, FAO further benefited the respondents via; animal ox plough, (FFS) Farmer Field School, training, diversifying livelihood and food crop value addition. FAO provide ox plough to assists the respondents in land clearing and ploughing, it was agreed by (45%) of the respondents. In other words, (45%) of the respondents benefited. Farmer Field





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School was introduced in other to teach farmers and (89%) of the respondents benefited. FAO helped the respondents to have other income apart from food crop production. It taught them other apprenticeship; such as trading, tailoring, shoe making. (90%) of the respondents diversified their income. Put differently, (96%) which is the overwhelming majority diversified income and this could ensure food security. FAO in other to ensure value for money invested in food crop production, it trained the farmers on how to add value to the produced crops, so as to gain double profit. It was agreed by (95%) of the respondents that they have added value and benefited.

**Table 2:** Contribution of FAO in increasing Food Security

Items	Frequency	Percentage
Distribution of Seeds	87	87%
Distribution of Inorganic Fertilizer	79	79%
Distribution of Simple Farm Tools	67	67%
Market Linkage	85	85%
Provision of Animal Ox Plough for Land		
Clearing	45	45%
Farmer Field School	89	89%
Assisting in Diversifying Livelihood	96	96%
Food Crop Value Addition	95	95%

Source: Field Survey, 2021.

### **Food Security Status of the Respondents**

Table 3 revealed that (65%) which constitute the majority were food secured. Only (35%) were not food secured. The implication of the 35% not been food secured could be the small plot/farm they had. Despite the fact that FAO intervened to ensure food security (35%) could not be food secured. It is worthy to mention that the intervention of FAO made (65%) food secured. This justified the various intervention provided by the FAO.

**Table 3:** Food Security Status of the Respondents

Status	Frequency	Percen	tage
Secure		65	65.0%
No Secure		35	35.0%
Total		100	100.0

Source: Field Survey 2021.

### **Influence of Socioeconomic Characteristics on Food Security**

Logistic regression model was used to examine the influence of socioeconomic characteristics on food security. The results are presented in Table 4. Logit regression estimate of factors influencing the socioeconomic characteristics on food security. The influence of the socioeconomic characteristics on food security in Jere L.G.A is presented in Table 4. The regression result revealed that 9 out of 10 variables included in the model were significant in households. The significant variables at 5% level of significance were age, household size, years in education, farm size, farming experience and access to extension service while marital status, income and access to credit were significant at 1%. The value of the R<sup>2</sup> that the model explains that 54.71% variation in the data. The results are discussed as follows:





Age was positively related to food security implying also that older household heads have higher probability of being food secure. This agrees with the work of Asogwa and Umeh (2012) who reported that the higher the age of household head, the better the food security situation as there may be more options of making food available from both agriculture and nonfarming opportunities. It is also in line with *a priori* expectation. This means that as the age increases to a certain, the greater the likelihood of the household being food secure because the farmer becomes more experienced. Marital status was significant at 1%. Positive relationship existed between marital status and influence on food security among food crop farmers.

The coefficient of household size was found to be positive not as expected and significant at 1%. Household size either determine the availability of family labour or large household size demands large amount of production to feed its members, that is, as household size increases, the demand for food increases. Increase in family size necessitates increase in house expenditure on food and other necessities/utilities which ultimately increases food insecurity

The coefficient of the variable was significant at 5% and exhibit positive relationship as expected. This agrees with economic literature (Obamiro et al., 2004) that educational attainment at any level can significantly affect household's food security status. The result, therefore, implies that as the level of education of household heads increases, income level increases, level of awareness of food requirements increases which impacts positively on the households' nutrition decision. Food security intensity therefore increases in households with literate household heads than their illiterate counterparts and vice versa. A positive relationship existed food security and influence on farm size at 1% significant level. This is in line with a priori expectation. This indicate that farm size influences level of food availability in households. A significant positive relationship existed between food security level and income level at 1% among food crop farmers. The possible explanation is that households having high income as less likely to become food insecure than low-income households as income influences purchasing power of households at the prevailing prices. Farming experience also had positive relationship with food security which means that with more experience the likelihood to be food secure increases. This result is consistent with that of Oluyole et al. (2009), who reported that a more experienced farmer is likely to have higher productivity and hence be able to provide more food for his household members. This is in line with a priori expectation. The coefficient of this variable was significant at 5% and positively related to food security as expected. It is believed that farmers who have who have frequent access to extension personnel and services have potential to adopt valuable extension advices and improve productivity, hence food security.

The coefficient of access to credit was significant at 1% and carries a positive sign as expected suggesting that access to credit to tend positively influence the food security level of households. Credit is an important means of investment and households who have access to credit can invest in farming activities to earn more income so that derived revenue increases financial capacity and purchasing power of the household to escape from risk of food insecurity. Moreover, it helps to smooth consumption when household is faced with temporary food problem. Food security status increases as households are economically empowered, all things being equal, through their investment and vice versa.



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**Table 4:** Factors influencing the socioeconomic characteristics on food security

Variables	Coefficient	Std. Err	Z
Sex (X1)	0.0213	0.0180	1.18
Age (X2)	0.0426	0.0206	2.07**
Marital Status			
(X3)	0.0120	0.0032	3.8***
Household			
Size (X4)	0.1385	0.0670	2.07**
Years In			
Education (X5)	0.0525	0.0226	2.33**
Farm Size (X6)	0.0086	0.0041	2.1**
Income (X7))	0.0489	0.0170	2.88***
Farming			
Experience			
(X8)	0.5388	0.2718	1.98**
Access To			
Extension			
Service (X9)	0.0090	0.0039	2.32**
Access To			
Credit (X10)	0.2440	0.0325	7.51***
_cons	3.2418	1.0647	3.04***
Log likelihood	-198.36448		2

Note: \*\* and \*\*\* are significant at 5% and 1% respectively;  $R^2 = 0.5471$ ;  $X^2 = 29.60$ ; Sex=

NS

Source: Field Survey (2021)

#### CONCLUSION AND RECOMMENDATIONS

The study concluded that FAO highly contributed in increasing food security status in the study area and also the socioeconomic characteristics of the respondents captured in the logit model influenced their food security status. Furthermore, the study observed that food security level among food crop farmer in Jere LGA hinges significantly on the economic levels of the food crop farmers. Base on the findings of the study the following recommendations were made:

- 1. Large household sizes and farm size were found affect food security level in the study area. Therefore, policy measures were directed towards the provision of better family planning, increased awareness and access to family planning facilities should give adequate attention and priority by government. In view of this, strategies for an effective community participation in design of concept and messages aimed at imparting knowledge about family planning to households are recommended.
- 2. In addition, Government should support FAO in order to ensure that food crop farmers have access to improved farm input such as seed, fertilizers, and others, gets to food crop farmers easily.

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