E-ISSN: 1115 – 831X P-ISSN: 3027-2963
MPRI-JAVS | INTERNATIONAL JOURNAL OF AGRICULTURAL AND VETERINARY SCIENCE
VOL. 06 NO. 1 - OCTOBER, 2024

EFFECTS OF FOOD AND AGRICULTURAL ORGANISATION INTERVENTION PROGRAMME ON FARMERS' MILLET YIELD IN SELECTED INSURGENCY AFFECTED COMMUNITIES OF BORNO STATE, NIGERIA

MOHAMMED, K.; TIJJANI, H.; & ADAMU, A. GADZAMA

Department of Agricultural Technology, Ramat Polytechnic, Maiduguri, Borno State, Nigeria.

Corresponding Author:
alhassanadamu120@gmail.com

DOI Unique ID: 10.70382/mejavs.v6i1.007

Abstract

This study assessed the effect of FAO intervention programme on Millet (Pennisitum glaucum) yield in some selected insurgency affected communities in Borno State, Nigeria. A multistage sampling procedure (involving both purposive and stratified) was used to select 384 farmers for the study. Data were obtained with the aid of questionnaire and analysed using Descriptive and Inferential Statistics. Findings of the study reveal that majority (78.6%) of the farmers were males and married (85.7%). Their average age and household sizes were 44.52 years and 10 members respectively. Z-test analysis was employed to compare the yield of millet before and after FAO intervention and the result was significant at 1% (<0.01) which confirms significant difference in yield of the beneficiaries before and after FAO intervention. One-way Analysis of Variance was used to

Key word: Effects Food and Agricultural Organisation, Intervention

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

analyse the difference in yield of FAO beneficiaries IDPs, host families and returnees, and the result reveals that there was no significant difference in their yield because the p-value of (0.109) is greater than that of level of significance (0.05). It was concluded that the yield of the beneficiaries after FAO intervention was higher than the yield of millet before the intervention. The study recommended that should government should improve the security situation in the study area.

Introduction

Background of the Study

Pearl millet (*Pennisetum glaucum)* is a primary food grain crop consume by millions of people in the tropical and sub-tropical areas of Africa (Mason, Maman, and Pale, 2015). In most African countries where the cereal is grown and production is documented, pearl millet ranks high in terms of importance. In Niger, it ranks first in terms of total cereal cultivation and production (Ndjeunga and Nelson, 2005) and it is the most important staple cereal crop in Namibia (Chandra, Chandra and Sharma, 2016).

Nutritionally, millet contains high level of quality protein (Yadav, Sharma, Chikara, Anand, and Bansal, 2014) in addition to having good levels of micro-nutrients relative to common cereals like sorghum, rice, maize and wheat (Taylor, Belton, Beta, and Duodu, 2014). Pearl millet is consumed as thick or thin porridge, cakes, or steamed granulated products in addition to the grain being used as source of yeast in the brewing industry (Shobana, Krishnaswamy, Sudha and Nagappa, 2013). All these forms of pearl millet utilization meet particular standards set by the users who may be producers, processors or direct consumers. This leads to a variety of preferences which forms the basis for pearl millet breeders to develop varieties that have the desired qualities needed by the end-users. As food, millets are nutritionally equivalent or superior to most cereals; containing high levels of methionine, cystine and other vital amino acids for human health. They are also unique sources of pro-vitamin A (yellow pearl millets) and micronutrients (Zn, Fe and Cu) which are especially high in finger millet (Jukanti, Gowda, Rai, Manga, and Bhatt, 2016).

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Pearl millet has numerous uses both in developed and developing countries; a reason why farmers perpetually grow the cereal. While in developed countries, pearl millet is grown for forage for livestock and an ingredient in the animal feeds (Mall and Tripathi, 2016), millet is a major food crop for the dry zones in many developing countries. In these countries, the grain is mainly used as food while the stove is fed to livestock (Abdou, Nsahlai, and Chimonyo, 2011), the stove is also used for building and as fuel for cooking (Malla and Timilsina, 2014).

Millet is an important staple food crop across sub-Saharan Africa and consumed by 75 percent of the people in Northern Nigeria. In the Northern Guinea Savannah and Sudan Savannah Zones, it is second to sorghum, but supersedes sorghum in Sahel region (Akinbomi, Brandberg, Sanni, and Taherzadeh, 2014). Millet is the basic staple food and yearly production stand at 6.1 million metric tons in Nigeria. Millet production is distributed differentially among a large number of African countries; largest producers being in West Africa led by Nigeria (41%), Niger (16%), Burkina Faso (7%), Mali (6.4%), Senegal and Sudan (4.8%). Of the 14 million hectares grown in West Africa, Nigeria is the largest producer, with an output representing 31 % of the African output of the crop (Akinbomi, *et al.,* 2014). The output of millet in Nigeria was estimated at 5.136 million tons in 1990, but decreased to 3.986 million tons in 1992 (Ahmad, Samuel, Makama, and Kiresur, 2015). Also, the total demands for millet in Nigeria in 1997 and 2000 have been projected as 6.454 and 7.454 million tons respectively. This is against the actual production of 5.90 million tons in 1997 and projected production of 5.96 million tons in 1999 (Olowa and Olowa, 2016).

The future trends in millet production need increasing productivity and trade (regionally and internationally) through adding value to the products by improving/increasing, processing and utilization by the industries. In 2017, Food and Agriculture Organization (FAO, 2018) assisted more than 1.5 million people with inputs for millet production, focusing on internally displaced populations

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

(IDP), returnees and host communities, in North Eastern States of Adamawa, Borno and Yobe state of Nigeria.(FAO, 2018).

In an attempt to address food insecurity and restore livelihood among the people affected by insurgency, FAO provides support to the government of the affected area through provision of improved pearl millet varieties and other agricultural inputs. Also through addressing the food security issue, FAO introduced FAO response strategy which continued to strengthen resilience among food insecure communities. This FAO programme aims at developing relevant responses to food crises since 2014 by supporting the crises affected population with improved Agricultural inputs and livelihood assets such as early maturing crop verities, good quality fertilizer, irrigation and micro-gardening equipment and food processing assets. Thus, this effort by FAO was to build resilience of communities and a hunger free world through an Agricultural Input Support Programme (Ayuba, 2007).

Cereal crop such as millet is among the food crop intensively cultivated in Borno State. The majority of the farmers in the State were observed to be using low yielding local varieties of millet with minimum application of inorganic fertilizers as a result of its high price which is likely to decrease millet productivity per hectare. The low output of the crop in the State is a threat to food security because of increasing population. However, governmental and Non-Governmental Organizations in emerging States are known to contribute their quota to the uplift of millet productivity to the next level. FAO has intervened in the distribution of seeds and fertilizers in 2018 to both host families and internally displaced households in the State in order to alleviate their suffering in terms of food security. However, there was little or no assessment of the effect of the FAO input extension intervention, to ascertain the immediate benefits of the intervention programme in increasing millet output in the area. Therefore, this study intent to analyse the effects of FAO Input Extension Intervention Programme (IEIP) on millet yield in Borno State, Nigeria.

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Statement of the Problem

FAO is one of the international organizations that distribute inputs to farmers in communities stricken by hunger as a result of famine, flood, insurgency and other natural disasters. The organization provides inputs such as improved varieties of millet and fertilizer to internally displaced people (IDPs) and returnees, in order to alleviate their sufferings. In view of the above, the problem worth stating here include: the farmers have been traumatized by the insurgency, properties including seed stocks (millet) were all lost, most farmland were not secured for farming and there is virtually little or no financial support for the farmers. FAO in collaboration with Borno State Agricultural Development Programme (BOSADP) distributed seeds of improved millet variety (SOSAT) and fertilizers to affected communities in 2017 and 2018.

However, no research has been conducted to investigate the effect of FAO input extension intervention in the study area. It is in the light of the above mentioned problems that this study provides answers to the under listed research questions:

i. what are the socio-economic characteristics of beneficiaries of the FAO supported input intervention in the study area?
ii. what is the millet yield of the farmers before and after FAO intervention in the study area?
iii. what are the constraints faced by the beneficiaries in accessing inputs provided by FAO input extension intervention in the study area?

Objectives of the Study

The main objective of this study is to assess the effect of FAO input extension intervention programme on the beneficiaries in Borno State, Nigeria. The specific objectives of the study are to:

i. describe the socio-economic characteristics of the beneficiaries of the FAO input extension intervention in the study area;
ii. compare the yield of millet among the farmers before and after FAO intervention in the study area; and

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

iii. ascertain the constraints faced by the beneficiaries of FAO input extension intervention in the study area.

Hypotheses of the Study

H0 1: There is no significant difference in beneficiaries millet yield before and after FAO intervention in the study area.

H0 2: There is no significant difference in yields between the Internally Displaced Persons (IDPs), host families and returnees in the study area.

METHODOLOGY

The Study Area

The study was conducted in Mafa and Jere Local Government Areas of Borno State, Nigeria. The study area is located in the North- Eastern part of Nigeria; covering a land area of 3,737square kilometres. It is situated within Latitudes 11° 48' N and 12° 25' N of the equator, and Longitudes 11° 30' and 13° 55' east of the Greenwich meridian (Borno State Diary, 2008). The study area has a population density of approximately 170 persons per square kilometre. It has an estimated growth rate of 3.4% per annum and a projected population of 634,491 by 2020 (National Population Commission, 2006). The study area is a component of Borno State which occupies the greater part of the Lake Chad Basin and shares borders with the Republics of Niger to the North, Chad to the North-East and Cameroun to the East. Similarly, Borno State shares boundaries with Adamawa, Gombe, and Yobe States to the South, West and North-West respectively (Baba and Maina, 2013).

The study area has a climate which is hot and dry for a greater part of the year. Normally, the rainy season is from June to October, with relative humidity of about 49% and evaporation of 203mm per annum. The hot season lasts for about 3months, from March to May, with an average daily high temperature above 36°C. The hottest days of the year are in April, with an average high temperature of 40.7°C and low temperature of 39.8°C. The cool season had an average daily high temperature below 32°C. The coldest days of

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

the year are in January, with an average low temperature of 20.6°C and high temperature of 32°C. This favours millet production throughout the State (Borno State Diary, 2008). The major occuipation of the people in Borno State includes farming, fishing and livestock rearing. The state lies within the Sahel Savannah ecological zone of Nigeria and has fertile soil for farming. The major crops grown are millet, cowpea, groundnut, sorghum and vegetables. While livestock reared in the state are cattle, sheep, goat and poultry. Dominant ethnic groups in the state are Kanuri, Shuwa, Babur and Marghi.

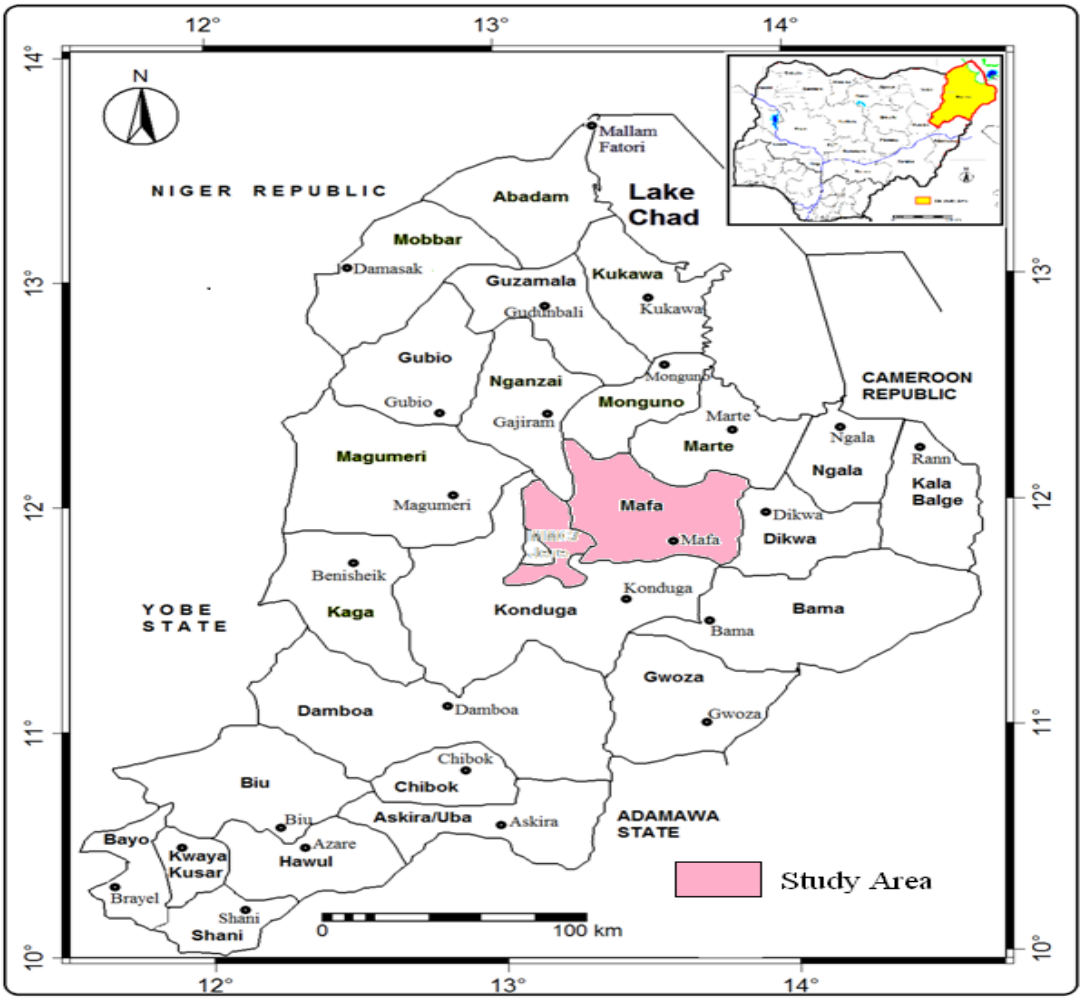

Figure 1: Map of Borno State Showing the Study Area

Source: Department of Geography, Faculty of Social Sciences, University of Maiduguri, Borno State.

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Sampling Procedure and Sample Size

Multistage sampling procedure was used to select respondents for this study. In the first stage, four (4) Local Government Areas were purposively selected from the six LGAs that benefited from the FAO input Extension Intervention Programme. In the second stage, 2 LGAs were purposively selected from the 4 LGAs who are dominantly millet producers. Thirdly, eight (8) wards were also purposively selected from the 2 LGAs based on the fact that these wards were the predominant areas of millet production and have high number of FAO input extension intervention beneficiaries. In the fourth stage, stratified sampling method was used to obtain three strata of beneficiaries from each ward. The sum of the three strata that is IDP, returnees and host families gave the total number of beneficiaries from each ward. A list of all the beneficiaries (9492) was obtained from BOSADP and used as the sampling frame for this study. The proportionate selection from each was determined by using Yamane's formula for sample size estimator $n = \frac{N}{1+N\,(e^2)}$

Where:

n= Desired sample size

N= Total population

e= Accepted error limit (0.05 based on 95% degree of confidence)

Table 2.1: Sampling procedure and sample size of the beneficiaries

ADP Zones	LGA	Wards	IDPs	Returnees	Host families	Total	Sample Size $\frac{ward \times sample}{population}$
Zone I	**Jere**	**Dutsuman**	538	36	861	1435	58
		Dala	493	30	423	946	38
		Gongulong	679	63	773	1515	63
		Old Maiduguiri	159	10	382	551	22
		Zabarmari	463	8	574	1045	42
Zone II	**Mafa**	**Mafa Town**	1863	43	102	2008	81

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

		TamsuNgamdu	896	101	44	1041	42
		Loskuri	854	63	34	951	38
Sampling Frame						**9492**	**384**

Source: adapted from Borno State Agricultural Development Programme (BOSADP, 2018).

Data Collection

Data for the study were obtained through primary source with the aid of structured questionnaire administered to the respondents. Data collected were on the socio-economic, constraints and millet yield of the beneficiaries. The research instrument was designed to address the outlined objectives of the study. Secondary information were obtained from documented material such as Food and Agricultural Organization (FAO) publications, Borno State Agricultural Development Programmed (BOSADP), journals, books, and conference proceedings, seminar papers, published and unpublished projects and internet sources. Primary data were collected by the researcher with the assistance of trained extension agents. The period of data collection lasted for 3 months.

Data Analysis

Data obtained for the study were analyzed using descriptive statistics such as frequency count, percentage, mean and standard deviation to achieve specific objectives i and iii inferential statistics such as Z–test was used to achieve objective ii.

Model Specification

Z-test

$$\mathbf{Z} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Where;

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Z= the calculate Z- test

$\overline{X}_1$ = mean annual yield (t/ha) of the beneficiaries after the intervention programme

$\overline{X}_2$ = mean annual yield (t/ha) of the beneficiaries before the intervention programme

S_1^2 = standard deviation of beneficiaries after the intervention

S_2^2 = standard deviation of beneficiaries before the intervention

n_1 = sample size of the beneficiaries after the intervention

n_2 = sample size of the beneficiaries before the intervention

Table 2.2: The ANOVA statistical tool was used in analysing the differences in yield between the IDPs, Returnees and Host families.

Sum of Variations	Df	Sum of squares (SS)	Mean sum of squares (MSS)	F-test	P-Value
Treatment	k-1	SSTr	sMSTr = SSTr/(k-1)	F = MStr/MSE	
Error	N-k	SSE	MSE = SSE/(N-k)		
Total	N-1	SSTo			

The sum of squares for the ANOVA table has the relationship of SSTo = SSTr + SSE.

Where

$$\text{SST} = \sum_{i=1}^{k}\sum_{j=1}^{ni}(x_{ij} - \bar{x})^2$$

$$\text{SSTr} = \sum_{i=1}^{k} n_i(x_{i.} - \bar{x})^2$$

$$\text{SST} = \sum_{i=1}^{k}\sum_{j=1}^{ni}(x_{ij} - \bar{x}_i)^2$$

k = The number of groups of the explanatory variables

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

n_i = The sample size taken from group i.

x_{ij} = The jth response sampled from the ith group.

$\bar{x}_i$ = The sample mean of responses from the ith group.

n= The total sample, irrespective of groups.

$\bar{x}$= The mean of all responses, irrespective of group.

RESULTS AND DISCUSSION

This chapter presents the results and discussion of the findings. The collected data from the respondents were analyzed based on the objectives and hypotheses that guided the study.

Socio-economic Characteristics of the Respondents

The socio-economic characteristic of the respondents' included in this study were: sex, age, marital status, major occupation, educational attainment, farm size, household size and farming experience. It also provides the information on descriptive analysis using frequency, percentage, mean and standard deviation.

Categories of farmers

The type of farmer was considered as one of the factors influencing agricultural production. Result presented in Table 3.1a revealed that more than half (55%) of the respondents were host families, 25.8% of the respondents were returnees and only few (19.3%) of the respondents were IDPs. This implies that majority of the participants were host families. This finding is in line with FAO (2018) which reported that host families had higher percentage among the beneficiaries of FAO input intervention in North-eastern Nigeria.

Sex

Sex determines the attributes and other qualities of the individual farmer. Results presented in Table 3.1a showed that majority (78.6%) of the respondents were males while only few (21.4%) were females. This implies that

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

majority of the respondents were males. This is in accordance with Okeke, Agul and Onogwu, (2014) who reported that male millet farmers constitutes 90% of the respondents and female farmers has low percentage which might be due to some cultural and religious laws which tends to restrict women from participating in laborious agricultural activities in the study area.

Age of the respondents

Result in Table 3.1a revealed that 41.7% of the respondents were within the age group of 40 to 49, 24% of the respondents were within the age ranges of 50 to 59; 21.1% of the respondents were within the age brackets of 30 – 39 years, 7.3% were within the age group of 60 to 69 years; 4.4% were within the age group of 20 – 29 years and lastly, 1.3% were 70 years and above. The mean age of the respondents was 45 years which indicated that majority of the respondents were in their active and productive ages. These finding tallies with Ango *et al.* (2011) who reported that majority of the farmers in Northern Nigeria were within their active and productive ages.

Marital status of the respondents

Table 3.1a revealed that majority (85.7%) of the respondents were married, 8.9% of the respondents were widow/widower, 2.9% of the respondents were single and only few (2.6%) of the respondents were divorced. This implies that majority of the respondents were married in the study area which could be due to the religious and traditions of the people in the study area where marriage is considered as a sign of adulthood and responsibility. This finding in line with Okeke *et al.* (2014) in their study which revealed that 78.3% of the farmers were married, while 21.7% were single. The authors stressed that marital status of millet farmers was as one of the demographic features determining technology adoption among pearl millet farmers and that most of the heads of the households that participated in the study were married.

Occupation of the respondents

Table 3.1a indicated that majority (93%) of the respondents had farming as their major occupation, 5% of the respondents were traders and only few (2%) of the respondents were tailors. These implies that majority of the respondents

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

opted for farming as the major source of livelihood in the study area due to the availability of vast arable land for crop production and availability of inputs. This is in support of the finding of Ojiagu and Uchenna (2015) who reported that majority of the respondents were full time farmers indicating that the respondents depend heavily on farming and farming activities for generation of income.

Educational attainment of the respondents

Result in Table 3.1a showed that about half (49.48%) of the respondents had attended Quranic education, 28.13% of the respondents attended primary school, 18.75% of the respondents attended senior secondary school and only few (3.65%) of the respondents attended tertiary education. This implies that majority of the respondents attended Qur'anic education in the study area. This finding is in contrast with that of Ndjeunga *et al.* (2011) who revealed that majority of farmers had primary education in both rain fed and irrigated situation. In both rain fed and irrigated situation, farmers having secondary education occupied the second position.

Table 3.1a: Socio-economic characteristics of the respondents ($n = 384$)

Variables	Frequency	Percentage	Mean	SD
Type of Farmer				
Returnee	99	25.8		
IDPs	74	19.3		
Host Families	211	55		
Sex				
Male	302	78.6		
Female	82	21.4		
Age (years)				
20-29	17	4.4		
30-39	81	21.1		
40-49	160	41.7	45	9.8
50-59	93	24.2		

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

60-69	28	7.3		
70 and above	5	1.3		
Marital Status				
Single	11	2.9		
Married	329	85.7		
Widows/widower	34	8.9		
Divorced	10	2.6		
Major Occupation				
Farming	359	93		
Trading	19	5		
Tailoring	6	2		
Educational Attainment				
Primary	108	28.1		
Junior Secondary	0	0		
Senior Secondary	72	18.8		
Tertiary	14	3.7		
Qur'anic	190	49.5		

Source: Field Survey, 2023

Farmers cooperative membership

Table 3.1b revealed that out of the 384 respondents who were interviewed, majority (93.8%) did not registered with any cooperative association due to lack of motivations by the organizations, while few (6.3%) registered with farmers' cooperative association. This implies that majority of the respondents in the study area refused to register with any cooperative association due to insincerity and lack of motivation from various cooperatives in changing their lives. This is in contrast with the findings of Ukamaka, Emmanuel and Moses (2017) which said that farmer's membership of cooperative societies avails them with opportunities of getting a strong bargaining power for loans and other services, a favourable atmosphere for a more effective government aid scheme, provision of services to members at a reduced cost and mobilisation of funds for farm business.

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Access to credit facilities

Table 3.1b showed that majority (96%) of the respondents had no access to credits while only few (4%) of the respondents had access to credit. This implies that there is poor access to credits in the study area this might be as a result of not registering and forming of a cooperative association because most credit institutions in the country don't usually deal with individual farmers. The credit institutions like the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL), Microfinance Banks and NGOs usually give credits to cooperatives rather than individuals. This is in support with the findings of Gadanakis and Silong (2018) who reported that Group membership enables members to derive the benefit associated with social collateral. Credit facilities benefited by the few respondents in the study area include: private commercial loan, money lenders, NGOs and relative/friends.

Farm size

Table 3.1b revealed that more than half (51%) of the respondents had a farm sizes of 1.6 – 2.5 hectares, 48.7% of the respondents had a farm size of 0-1.5 hectares, while few (0.3%) of the respondents had farm size of 2.6-4.0 hectares. The mean for farm size was 1.46 which implies that majority of the respondents had small farm sizes which showed that they are mostly in subsistence farming. In a related study, Kolade (2015) revealed that about 2% and 18% of the beneficiaries and non-beneficiaries respectively had farm size that ranges between ≤1.0-2.9 ha.

Household size of the farmers

Table 3.1b showed that 56% of the respondents had 6-10 family size, 18.5% of the respondents had a family size of 11 – 15 members, 14.3% of the respondents had household size of 1-5 members, 7% of the respondents had household size of 21 – 25 members, 1.56% of the respondents had a household size of 26 – 30 members and only few (0.8%) of the respondents had a household size of 31-35members. The mean household was 10 people which imply that majority of

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

the respondents had large household size. This is in line with the study of Ndjeunga *et al.* (2011) who reported average household size of 8 members among millet producing households. Notwithstanding, Kidoido *et al.* (2002) reported that average family size of 8 persons per family was considered higher than the national average family size (5 persons per family).

Farming experience

Result in Table 3.1b showed that higher percentage (40.4%) of the respondents had faming experience of 11-20 years followed by36.2% of the respondents had faming experience of 21 – 30 years. Others include; 10.9% of the respondents had a farming experience of 1-10 years, 10.7% of the respondents had a farming experience of 31-40 years, 1% of the respondents had a farming experience of 41-50 years and only few (0.8%) of the respondents had a farming experience of 51 – 60 years. The mean years of farming experience was 23 years which implies that majority of the respondents were experienced in farming in the study area. Oluwatayo, Sekumade and Adesoji (2020) noted that farmers with more experience are more efficient, have better knowledge of climatic conditions and market situation and are thus, expected to run a more efficient and profitable enterprise.

Table 3.1b: Socio-economic characteristics of the respondents ($n = 384$)

Variables	Frequency	Percentage	Mean	SD
Farmers Cooperative Membership				
Yes				
No	24	6.3		
	360	93.3		
Access to Credit Facilities				
Yes				
No	17	4		

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

	367	96		
Farm Size (Hectares)				
0-1.5	187	48.7		
1.6-2.5	196	51	1.46ha	0.7
2.6-4.0	1	0.3		
Household size				
5-Jan	55	14.3		
10-Jun	215	56		
15-Nov	71	18.5		
16-20	27	7	10 people	5.5
21-25	7	1.8		
26-30	6	1.6		
31—35	3	0.8		
Years of Farming Experience				
1-10 years	42	10.9		
11-20 years	155	40.4		
21-30 years	139	36.2		
31-40 years	41	10.7	23 years	9.2
41-50 years	4	1		
51-60 years	3	0.8		

Source: Field Survey, 2023

Hypothesis Testing One

3.2 Yield of Millet before and after FAO Intervention in the Study Area

Z-test was used to determine whether there is significant difference in the millet yield before and after input extension intervention programme in the study area. Z-test was used because two measurements were taken on the same experimental unit (i.e. yield before intervention and yield after intervention). The summary of the analysis is given in Table 3.2 below:

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Table 3.2: Summary of the Z-test for the yield before and after FAO Inputs extension intervention programme in the study area

Variable	N	Mean	SD	Mean Difference	t-ratio	p-value	Remark
Before FAO intervention	384	902.06	543.56				
				383	-10.305	0.000	Reject H_{01}
After FAO intervention	384	1349.92	1131.13				

Source: Field Survey, 2023

Table 3.2 above showed the result of the Z-test. The result reveals that there was significant difference in the yield of the beneficiaries of the FAO intervention before and after intervention with (Mean before= 902.06, Mean after= 1349.92, mean difference= 383, ($p<0.05$). Since the p-value (0.000) is less than the level of significant (0.05), there is significant difference in the yield of the beneficiaries before and after intervention. Therefore, null hypothesis is hereby rejected. This result is an indication that the improved millet seed and fertilizer given to the farmers impacted positively on their output in terms of yield. Consequently, there was increase in millet output and income as well as improvement in food security, reduction in poverty and improve in standard of living.

Testing of Hypothesis Two. One way Analysis of Variance was used to determine whether there is significant difference in the yield of FAO beneficiaries for internally displaced persons (IDPs), host families and returnees who benefited from the FAO intervention in the study area. One-way Analysis of Variance was used because there is need to test for mean different of three groups of farmers and the summary of the analysis is given in Table 3.2.1 below:

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Table 3.2.1: Descriptive statistics of the yield of the beneficiaries in the study area

Type of farmer	N	Mean Yield (kg)	SD	Minimum (kg)	Maximum (kg)
Returnees	99	1539.90	1600.701	500	15000
IDPs	74	1191.89	852.676	500	5000
Host families	211	1316.21	926.329	300	9000

Source: Field Survey, 2023

Constraints Faced by the FAO Beneficiaries

Constraints faced by the FAO beneficiaries includes; late distribution of farm inputs, insecurity, inadequate capital, inadequate supply of fertilizer, inadequate extension agents, lack of pesticides and herbicides and inadequate seeds. The result is presented in Table 3.3 below;

Table 3.3: Constraints Faced by the FAO Beneficiaries

S/N	Constraints *	Frequency	Percentages	Rank
1	Late distribution of farm inputs	300	78.1	1st
3	Inadequate capital	165	43.0	2nd
2	Insecurity	160	41.7	3rd
7	Inadequate seeds	127	33.1	4th
4	Inadequate supply of fertilizer	119	31.0	5th
5	Inadequate extension agents	92	24.0	6th
6	Lack of pesticides and herbicides	89	23.2	7th

Source: Field Survey, 2023

***Multiple Responses**

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Table 3.3 revealed that majority (78.1%) of the beneficiaries of the FAO intervention had problem of late distribution of farm inputs. Also, 41.7 of the respondents had problem of insecurity, 43.0% of the respondents had problem of inadequate capital, 33.1% had problem of inadequate seed and 31.0% of the respondents had problem of inadequate supply of fertilizer. Other constraints include inadequate extension agents (24.0%), lack of pesticide and herbicides (23.2%). Late distribution of farm input was the major problem faced by the beneficiaries in FAO intervention. Galadima, (2014) discovered that various factors such as low level of awareness, cultural barriers, inadequate capital and illiteracy which ranked 1st, 2nd, 3rd and 4th respectively as factors affecting the programme beneficiaries.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This study assessed the effects of food and agriculture organisation (FAO) intervention on millet *(pennisetumglaucum)* yield in some selected Insurgency affected communities of Borno state, Nigeria. A Multistage sampling procedure which include purposive and random was used to obtain a sample of 384 respondents out of 9492 beneficiaries. Data for this study were obtained with the aid of structured questionnaire. Data collected were analysed using descriptive statistics, Z-Test and ANOVA. Findings on the socioeconomic characteristics of the respondents showed that majority (78.6%) were males. The mean age of the beneficiaries was 45 years, while majority of the respondents were married with average households' size of 10 individuals. Majority (93%) of the respondents had farming as their major occupation. The result showed that about half (49.48%) of the respondents had attended Qur'anic education. The result further showed that majority (93.8%) of the respondents did not register with any cooperative association due to lack of motivations by the organization. Findings also showed that majority (96%) of the respondents had no access to credits while few (4%) of the respondents

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

had access to credits. The mean farm size of the respondents was 1.5 hectares. The mean farming experience of the respondents was about 23 years.

The findings on yield of millet before and after FAO intervention in the study area revealed that there was significant difference in the yield of the beneficiaries of the FAO intervention for before and after intervention with (Mean before= 902.06, Meanafter= 1349.92, DF= 383, t= −10.305, and p-value= 0.00). Since the p-value (0.000) is less than the level of significant (0.05), there is significant difference in the yield of the beneficiaries. Therefore, null hypothesis was rejected. Constraints faced by the FAO beneficiaries as shown by the finding of the study were late distribution of farm inputs, insecurity, and inadequate capital among others.

Conclusion

Based on the findings of this study it is concluded that most of the beneficiaries in the study area depends on agriculture as a means of livelihood. Majority of the farmers in the study area were not members of cooperative associations and had poor access to credit facilities. There was significant difference in the millet yield of the beneficiaries of the FAO input extension intervention programme. However, there was no significant difference in the yield of internally displaced persons (IDPs), host families and returnees in the study area. Late distribution of farm inputs was the major constraint faced by the FAO beneficiaries in the study area.

Recommendations

From the findings, the following recommendations were made:

1. The community members should liaise with the Army personnel and civilian JTF/hunters taskforce so as to curtail the menace of insecurity.
2. Extension Agents in BOSADP should encourage and motivate farmers to join cooperative associations to enable them have demand power to access productive inputs that will enable them to expand their farms and increase efficiency of resource usage.

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

3. Government should facilitate avenues through which farmers could have access to credits facilities;
4. Farmers should increase their farm sizes to enable them have adequate farm produce.
5. Dialogue should be considered as an option to restore long lasting peace, while agencies such as national orientation agency and religious organisations should aim at changing the mind-set of vulnerable youths to prevent them from joining insurgent groups.

REFERENCES

Abdou, N., Nsahlai, I. and Chimonyo, M. (2011). Effects of groundnut haulms supplementation on millet stover intake, digestibility and growth performance of lambs. *Animal feed science and technology, 169*(3-4), 176-184.

Ahmad, I. M., Samuel, E., Makama, S. and Kiresur, V. (2015). Trend of area, production and productivity of major cereals: India and Nigeria Scenario. *Research Journal of Agriculture and Forestry Sciences, 3*(2), 10-15.

Akinbomi, J., Brandberg, T., Sanni, S. A. and Taherzadeh, M. J. (2014). Development and dissemination strategies for accelerating biogas production in Nigeria. *BioResources, 9*(3), 5707-5737.

Ango, A. K., Abdullahi, A. N. and Abubakar, B. B. (2011).Role of socio-economic parameters in determining the efficiency of urban agriculture in providing food security inBirninKebbi Metropolitan Area, Kebbi State, North Western Nigeria. International Research *Journal of Agricultural Science and Soil Science,* 1 (6): 185-192.

Ayuba, H. (2007). *Climate Change Adaptation in Africa: Its Implications and Socio-Economic Prospects for Farmers in the Sub-Sahellian Agro-Ecological Zone. Nigeria*. ARDA: Technical Report, the African Radio Drama Association Lagos.

Baba, B. A.and Maina, Y. B. (2013). Marketing margin and transaction cost in pearl millet market supply in Borno State, Nigeria. *Greener Journal of Business and Management Studies, 3*(5), 201-206.

Borno State Diary (2008). Borno State Official Diary 2008. Garkida press. Sir Kashim Ibrahim Way Maiduguri. Borno State, Nigeria.

Borno State Agricultural Development Programme (BOSADP) (2018). Borno State Agricultural Development Programme Annual Report.

Chandra, D., Chandra, S. and Sharma, A. (2016). Review of finger millet (Eleusine coracana (L.) Gaertn): a power house of health benefiting nutrients. *Food Science and Human Wellness, 5*(3), 149-155.

Food and Agriculture Organization of the United Nations –FAO (2018). Result of 2017 rainy season programme in North Eastern Nigeria. Retrieved from www.fao.org> emergencies > resources > documents > resources.

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Gadanakis, Y. and Silong, A. K. F. (2018). Credit sources, access and factors influencing credit demand among rural livestock farmers in Nigeria. Journal Agricultural Finance Review. DOI: AFR-10-2018-0090.R3

Galadima, I. (2014). Impact of IFAD/CBARDP on rural livelihood in Yobe State, Nigeria.Thesis Submitted to the Department of Agricultural Economics and RuralSociology, Ahmadu Bello University, Zaria. https://www.worldcat.org**> title > pearl-millet-breeding >oclc**

Jukanti, A., Gowda, C. L., Rai, K., Manga, V.and Bhatt, R. (2016). Crops that feed the world 11. Pearl Millet (Pennisetum glaucum L.): an important source of food security, nutrition and health in the arid and semi-arid tropics. *Food Security, 8*(2), 307-329.

Kidoido, M., Kasenge, V., Mbowa, S., Tenywa, J.andNyende, P. (2002). Socioeconomic factors associated with finger millet production in eastern Uganda.

Kolade, S. (2015).Analysis of beneficiaries and non-beneficiaries ofcommercial agriculture development project on maize cooperative groups in Kano and Kaduna States of Nigeria.(M.Sc. Thesis), Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University Zaria, ***Nigeria.34-108.***

Mall, T. and Tripathi, S. (2016). Millets the nutrimental potent ethno-medicinal grasses: A review. *World Journal Pharmaceutical Research, 5*(2), 495-520.

Mason, S. C., Maman, N. and Pale, S. (2015). Pearl millet production practices in semi-arid West Africa: A review. *Experimental agriculture, 51*(4), 501-521.

Ndjeunga, J. and Nelson, C.H. (2005). Towards understanding household preference for consumption characteristics of millet varieties: A case study from western Nigeria. *Agricultural Economics:* 32:151 -165.

Okeke-Agulu, K., andOnogwu, G. (2014). Determinants of farmers adoption decisions for improved pearl millet variety in Sahel Savannazone of northern Nigeria. *Journal of Development and Agricultural Economics*, 6(10), 437-442.

Olowa, O. and Olowa, O. (2016). Food demand forecast for Nigeria (2016-2028). *Scientia, 15*(1), 340-343.

Oluwatayo, I. B., Sekumade A. B. and Adesoji S. A. (2008). resource use efficiency of maize farmers in rural Nigeria: Evidence from Ekiti State. *World Journal of Agricultural Sciences*, 4(1) 91-99.

Sakamma, S., Umesh, K. B., Girish, M. R., Ravi, S. C., Satishkumar, M.&Bellundagi, V. (2017) Finger Millet (*Eleusinecoracana*L. Gaertn.) production system:Status, potential, constraints and implications for improving smallfarmer's welfare. *Journal of Agricultural Science*; 10(1). 162-179

Shobana, S., Krishnaswamy, K., Sudha, V., Nagappa G.M., (2013). Finger Millet (Ragi, Eleusinecoracana L.). A review of its nutritional properties, processing, and plausible health benefits.Advances in Food and Nutrition Research. 69:1-39

Taylor, J. R., Belton, P. S., Beta, T., and Duodu, K. G. (2014). Increasing the utilisation of sorghum, millets and pseudocereals: Developments in the science of their phenolic phytochemicals, biofortification and protein functionality. *Journal of Cereal Science, 59*(3), 257-275.

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]

Ukamaka, A. T., Emmanuela, A. O. and Moses O. I. (2017). Socioeconomic determinants of farmers membeship of cooperative societies in Anambra State Nigeria. International *Journal for Innovative Research in Multidisciplinary Field. 3.* ISSN: 2455-0620.

Yadav, D. N., Sharma, M., Chikara, N., Anand, T., and Bansal, S. (2014). Quality characteristics of vegetable-blended wheat–pearl millet composite pasta. *Agricultural Research, 3*(3), 263-270

EDITOR-IN-CHIEF
Prof. H. U. Nwanjo [Nigeria]