ANALYSIS OF SOCIO-ECONOMIC DETERMINANTS OF FOOD INSECURITY AMONG INTEGRATED HOUSEHOLDS IN MAIDUGURI METROPOLIS, BORNO STATE, NIGERIA

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ABSTRACT

This study analyzed socioeconomic determinant of food insecurity among integrated households in Maiduguri Metropolis, Borno State, Nigeria. It covered 15 and five peripheral wards of Maiduguri Metropolitan and Jere LGAs respectively. A two-stage sampling procedure was adopted to draw respondents for the study; Purposive selection of ten large concentrations of integrated household wards and proportionate random selection of 376 integrated household. Both primary and secondary data were used for the study. Descriptive and inferential statistics were employed to analyze the data collected. The descriptive statistics used were frequency tables, percentages, mean and standard deviation while inferential statistics included Tobit regression analysis. The socioeconomic characteristics of integrated households' revealed majority (97.9%) male dominance, with 59.89 years average age of the household heads. The majority of the household heads (94.40%) were married. High proportion of household heads (62.00%) attained Islamic education. Those that practiced agricultural production, as primary occupation constitutes only 33.51% and 61.54% of these households were sustained by this occupation for less than 4 months. Only 3.31% of the households were food secure and sustained by own production for 12 months and above. Income diversified households composed 3.9%. The mean duration of households stay in the community was 29.4 years with 43% of households having 29 – 43 years. The results of influences of socioeconomic variables on the household food insecurity revealed that all the seven (7) variables have various degrees of effects on integrated household food insecurity level except for married heads and years in education as indicated by their levels of insignificance. However, age and sex are the only variable with positive coefficients 0.2363 and 9.04e-06 respectively. The coefficient for household duration of stay was significant at 5%. Nevertheless, significant disparities exist between samples means difference of food insecurity levels and sample means difference of dependency ratio of integrated households in the study area. Households with larger dependency ratios were likely to be severely food insecure.

INTRODUCTION

Maiduguri metropolis forms an integral part of Borno state that shares three porous international boundaries with the Republics of Cameroun, Chad and Niger. This encourages the proliferation of foreign extremist group and their indigenous counterpart that exacerbates the incidence of Boko Haram (BH) insurgency in North-East. BH insurgency has resulted in dire humanitarian situations as evident in businesses winding-up operations, livelihood crisis, human right abuses and casualties that left more than 10,000 civilian dead in 2014 (DTM, 2018). In addition, level of population displacement highlights the increasing magnitude of IDPs integrating into the household of relatives, friends and other good Samaritans that expands membership of households and over stretched the resources of the host communities. This indicated the leading roles of the area in the accommodation of IDPs. Before IDPs integration, population of Maiduguri Metropolis was 1,197,497(NPC, 2006), which was later projected to 1,907,600 in the year 2016 based on 2.8 population growth rate. IDPs integration increased the figure to 3,225,124 persons (DTM, 2016).

Integrated household food insecurity (IHHFI) is lack of "availability at most times of basic foodstuffs supplies to sustain a steady expansion of food consumption induced by ever increasing influx of internally displace persons (IDPs)largely in search of food aid that are received into the existing households of the host communities caused by armed Boko Haram (BH). However, according to current World Bank (2006) definition, food insecurity is a situation of fear or anxiety caused by lack of capability to produce and provide access to enough food to all people at all times. Therefore, integrated household food insecurity is food insecurity as a result of increased in membership of household due to influx of IDPs induced by BH. There exists a consensus that in matters pertaining food insecurity, food insecure households should be properly identified and the reasons for their insecurity investigated. Hence, an investigation of the factors that influence food insecurity relates to those variables for low performance of household's productivity with regards to crop, livestock and income (Akukwe, 2018). And further identified the following: household size with a coefficient of 4.123 was significant at 5%. In addition, household income with coefficient of -0.006 was significant at 5 and 10% respectively, household dependency ratio with coefficient of 0.422 was significant at 10% were the key determinants of household food insecurity. In a similar study Ali (2019) "Analysis of Food Insecurity among integrated Household of Maiduguri Metropolis" found large family size, low-income level and low level of education to be having negative impact on food security.

Therefore, meeting food needs of integrated households of Maiduguri metropolis remains a serious challenge due to socioeconomic factors mentioned above, however, urban nature of the dwelling with limited arable lands endowment, relatively high population density, results to food demand and supply gap that rises food prices. This worsens food insecurity and vulnerability situation in the area.

The economy of this dwelling is mainly driven by civil servants, traders and craftsmen. Others include; agro based commerce and farming. The area forms an integral part of Borno state that shares three porous international boundaries with the Republics of Cameroun, Chad and Niger. This encourages the proliferation of foreign extremist group and their indigenous counterpart that exacerbates the incidence of Boko Haram (BH) insurgency in area. BH insurgency has resulted in dire humanitarian situations as evident in businesses winding-up operations, livelihood crisis, human right abuses and casualties that left more than 10,000 civilian dead in 2014 (ICRC, 2015). In addition, level of population displacement highlights the increasing magnitude of IDPs integrating into the household of relatives and friends that expands membership of households and over stretched the resources of these households (integrated household).

The Internal Displacement Monitoring Centre (IDMC) (2016) indicated the threshold of IDPs influx as 2,152,000 in Nigeria as at 31st December, 2015. Out of this figure, 1,829,200 (85%) was as a result of insurgency attacks by armed BH elements. However, there remains a dearth of evidence on the drivers of food insecurity in these communities.

Therefore, the study attempts to investigate the relationship between households' socioeconomic determinants and food insecurity levels among households that accommodate Boko Haram Induced IDPs in Maiduguri metropolis.

Model of the Study

IHHFI is the food insecurity induced by ever increasing influx of resource less (IDPs) that are received into the existing households of the host communities. This was as a results of insurgent

attacked by armed BH. This definition presents relationship between varying levels of food insecurity and imposed IDPs in HH. Hence the choice and adaption of Tobit regression model was necessitated as conceptual model. This was done to determine functional relationship between household food insecurity level and those independent socioeconomic variables. The influence of HH socioeconomic characteristic on integrated household food insecurity level.

Tobit model is a censored normal regression model used for situations in which Y is observed for value greater than 0 but not observed (censored) for values of 0 or less. This is the basic idea behind device that led to its selection and application in the estimation of integrated household food insecurity determinants. The estimation of these determinants assumes that the dependent variable has a number of households (those that are food secure with 0 scores) and those that are food insecure with varying levels of food insecurity that are articulated as percentages that ranged for all values greater than 0. The standard Tobit model is thus defined

$$y_i^* = x_i\beta + e_i$$
$$y_i = y_i^* \text{ if } y_i > 0$$
$$y_i = 0 \text{ if } y_i \leq 0 \quad \ldots\ldots\ldots\ldots\ldots (1)$$

Where:
y_i^* = latent/hidden dependent variable
y_i = observed dependent variable
x_i = vector of the independent variables
β = vector of coefficients
e_is = error term ; assumed to be independently normally distributed with $e_i \sim N(0, \sigma^2)$ and Therefore, y_{iis} normally distributed [$y_i \sim N(x_i, \beta_i, \sigma^2)$]
The observed 0's value of the dependent variable mean either a "true" 0 or from censored data. At least there must be some observations from censored data, yi* that would always be equal to yi, the true model will therefore be linear regression and not Tobit model.

The maximum likelihood estimation of the Tobit model is as follows:

Let f(y) and F (0) denote the density function and cumulative density function for y*. The model implies that the probabilities of observing a non-zero y are f (y) and p(y*<0) = F (0) respectively. The log likelihood function for the model is therefore;

$$\ln L = (\prod_{-}(yi > 0) f(yi)\ \prod_{-}(yi = 0) F(0)) = \sum_{(yi>0)} lnf(yi) + \sum_{(yi=0)} lnF(0) \ .$$

the reason is that y* is also normally distributed (as the e_is are normally distributed) , f(y*) and f(0), therefore, the log likelihood function can be the re-expressed as in terms of the density function and cumulative density function of the standard normal distribution of φ (yi) and φ (0). The log likelihood function can be written in the familiar form as;

$$\ln L = \sum_{yi>0} [(-\ln\sigma + \ln(yi - xi\beta)] + \sum_{y=0} \ln(1 - \varphi \ln(xi\beta/\sigma)] \quad \ldots\ldots\ldots 3$$

Maximum likelihood estimation can then proceed in the usual fashion. To interpret the estimation results, the Marginal Effects (ME) of the independent variables on some conditional mean functions should be examined. In the familiar OLS model y = xβ + ε, there is only one conditional mean function, E (y) = xβ, and E (y)/ xk = βk, where xk is the *k*th independent

variable. This makes interpretation easy: βk measures the marginal effect on y of the *k*th independent variable. In the Tobit model, though, there are three different conditional means: those of the latent variable y*, the observed dependent variable y, and the uncensored observed dependent variable y / y >0. Accordingly, interpretation depends on whether one is concerned with the marginal effect of x on y*, y, or y / y > 0. Once one determines which marginal effect one is interested in, one simply examines the marginal effects of x on the appropriate conditional expectations.

Clearly, only for the latent index y* can β be interpreted as the marginal effects of the independent variables. There can be cases in which the mean of the latent y* is of central interest, but when the data are censored the mean of the observed y is usually of greater interest. The cumulative normal distribution is viewed as a desirable transformation in this case since it relates a variable (number of standard deviations from the mean) which has a range from minus infinity to plus infinity to another variable (a probability) which has a range from zero to one. Sani (2018) employed the Tobit analysis to investigate food insecurity and its coping mechanisms, and also Maurice et.,al. (2016) used the same model to analyze the two way causal relationship between food security and education. This model would be most appropriate in that according to Tobin (1958), Amemiya (1978), Akinola and Young (1985) the Tobit model assumes that the dependent variable has a number of its value clustered at a limiting value usually zero and uses all observations between those at the limit and those above the limit, to estimate a regression line. There is no level of food insecurity on the side of food secured households with zero scores then the sample is said to be truncated. This is to be preferred, in general, over alternative techniques that estimate a line only with the observations above the limit. The Tobit model is therefore viewed as a hybrid of the discrete and continuous model, which will simultaneously analyze the food insecurity levels and their socioeconomic determinants. The technique can be used to determine both changes in the probability of being above the limit and changes in the value of the dependent variable if it is already above the limit. This can be quantified for useful and insightful deductions (McDonald and Moffit, 1980).

METHODOLOGY

Pre-tested structured questionnaire was used to collect the data for the study. The questionnaire consisted of relevant household characteristics and household food insecurity modules.A two-stage sampling procedure was adopted to draw respondents for the study. Firstly, purposive selection of 10 large wards of integrated households in Maiduguri metropolis was made. These are: Bolori1, Gomari Airport, Gwange1, Gwange 2, Mai Musari, Mairi, Maisandari, Mashamari, Old Maiduguri and Shehuri North. Secondly, proportionate random selection of 376 integrated household heads was made from the sampling frame 10,615 households. The list of households was obtained from International Organization for Migration (IOM) and International Displacement Monitoring Centre (IDMC). The sample size was determined using Yamane's (1967) sample size estimator with 95% (e=95%) level of precision.The Yamane estimator is given as follows:

$$n = \frac{N}{1+N(e)^2} \quad \ldots\ldots\ldots\ldots\ldots 4$$

Where:
n_i = sample size
N= population size
e= level of precision used (0.05)
$_{i=}$ (1, 2, 3…) number of segments in the population
Both inferential and descriptive statistics were used to analyze the data. Tobit regression model was the inferential tool used while means, percentages and Household Food Insecurity Prevalence (HFIAP) and Severity were the descriptive tools used.

HFIAP is the final categorical food insecurity indicator used to report household food insecurity (access) status and severity. The change in HFIAP will be computed using HFIAS continuous score variable, which is more sensitive to capture smaller incremental changes over time than HFIAP indicator. HFIAP will be obtained by computing the percentage of households that fall in each Household Food Insecurity Category (HFIC) as follows;

$$HFIAP = \frac{HFIC}{TSH} X\ 100 \ldots\ldots\ldots\ldots\ldots\ldots 5$$

Where;
HFIAP = Household Food Insecurity Access Prevalence
HFIC = Household Food Insecurity Category
TSH = Total Sampled Households

The estimation of these determinants assumes that the dependent variable has a number of households (those that are food secure with 0 scores) and those that are food insecure with varying levels of severity of food insecurity that are articulated as percentages. This was achieved through operationalized definition of Household Food Insecurity Access Scale (HFIAS)for measurement and classification of households as perceived by household's experience of access to food availability at a particular period in a given community FANTA (2007).

The Tobit model is expressed as follows:

$Y_i = \beta x_i + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots$

i=1…n; Algebraically expressed for the ith integrated household heads as:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 \ldots\ldots(6)$

where:
β_0= intercept;
$\beta_1 \ldots \beta_7$= are parameter estimates that determine the signs and magnitude of the variables
Y_i= Integrated household food insecurity level
μ_1 = error term
$X_i \ldots\ldots X_7$ = set of socioeconomic (independent) variables as:
X_1 = Age of integrated household head (years)
X_2 = Sex (1=Male 0=Female)
X_3 = Marital status (1=Married 0= Unmarried)
X_4 = level of education of household head (number of years spent in formal education)
X_5 = Annual income of household heads (naira value)
X_6 = Diversification of income sources (income in naira value from other occupations)
X_7= Household duration of stay (number of years of stay in the community)

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Integrated Household Heads

Age of Household Heads

Table 1 presents the findings of the study on respondents' socio-economic characteristics. More than 43% (43.6%) of the integrated household heads studied fall between 47 to 62 years old, while household heads between the ages of 30 and below and those with 63 and above years constitute 6.1% and 19.4% respectively. The mean age of the household heads studied was 51.80 years. This revealed that most of the household heads in the area were above the age of 50 years, this age group could lack the strengthen require to cope with the most of the strenuous economic activities in the study area that could influence food insecurity. This is in line with the findings of Nurideen and shaufique (2017).

Sex of Household Heads

It is evident from Table 1 that most of the Household Heads (HHs) were male (97.9%) with few (2.1%) of them female. This indicates male dominance of steering family affairs over their female counterpart, which is as a result of the leadership position of males as heads of households in the area. The customs and tradition of the area places male at an advantage that that providesthem greater access to economic resources, while also bestowing on them responsibilities of providing for the entire household. Studies in the area, for instance, Ali (2019) agree with the findings of this study.

Marital Status

Table 1 depicts high proportion (94.40%) of married household heads , whereas 3.50% and 0.20% were singles and widowed respectively. This indicates that most of the integrated household heads were married and responsible to carter for the needs of their household.

Size of Integrated Households

The study revealed at the least 4% of the households have greater or equal to 26 members. Households 11 – 15 members were the modal class constituting 31.9%. This was closely followed (30.3%) by household with 6 – 10 membership.The mean size of households was 12 persons, which was above the pre-integration national average of 6 members. This is instructive that households are worse off with unprepared influx of displaced relations that are taking refuge in the host household. This could further stretch the food insecurity situation of the affected households. The implication is that a marginal increase in the membership of household increases the chances of household food insecurity by certain level depending on the membership and socio-economic characteristic. This result concurs with that of Silvestril (2015).

Educational level of Household Heads

The finding in Table 1 indicates some (14.90%) heads of households had primary education as only 1.3% were without formal education. Majority (62%) have Islamic education, which indicates that most of the HHs did not have formal western education. Formal educational certificates are a prerequisite for jobs in the public sector, therefore the low level of formal education in the area could result to affected persons less chance of accessing formal employment and other income generating opportunities. However, this couldn't stop getting the influx of IDPs into the existing households further exposed them to food insecurity that might not cope with their income. This is in line with findings of Kumba (2015).

Annual Income of Household Heads

The result in Table 1 also presents the annual income of HHs, majority (89.1%) have annual income of 600,000 Naira or less. While 09.30% have 601,000 to 1,200,000 Naira, 10.4% had income of up to 1,801,000 Naira per annum. The estimated mean annual income for the sample was 359,376 Naira per household with a standard deviation of 341,794.2. This shows low annual income of HHs that supports smaller pre-integration food insecure household size which is smaller than the expanded integrated household size. This was has a result of the influx of resource less IDPs into the existing household without corresponding increase in income. This could be the reason for exacerbated level of food insecurity in the area.

Primary Occupation

Table 1 shows that Non-working class constituted the minority with 01.6% while majority are civil servants (49.2%). This was followed by Livestock and Crops farmers that constituted 18.6% and 10.6% respectively. Artisans and Traders constituted 08.5% and 07.2% respectively. This indicates those that practice agricultural production as primary occupation constitute only 33.51% while 66.49% were in other sectors of the economy. This indicates that about half of those of the other sectors of the urban economy engaged in agricultural production. This could imply that, people in urban settings do not normally depend on their farms for household food needs. They mostly depend on markets as most of them are not farmers as indicated by the output from agricultural production in the area could not sustain the growing population including IDPs in the households of the host communities. Therefore, an increase chance of aggravated food insecurity is expected in the area. This finding is in line with Ali (2019) and Silvestril et al.,(2015).

Income Diversification of IHH

It is evident from Table 1 that most (96.1%) of the HHs derive their income from a single source. This means most of the households do not have other income sources apart from the main occupation. Only a few (3.9%) of these HHs have more than one income source. This finding therefore indicates further deterioration due to lack of income diversification. This findings concurred with the study of Mutiah and Istiqomah (2017).

Households Duration of Stay in the Community

The result of the study on Table 1 shows about 43% of the HHs have stayed in the communities for between 29 and 42 years while 22% have stayed for 15 to 28 years. The mean duration of stay was 29.4 years with a standard deviation of 15.48. The implication of this finding is that households that stayed in the host community for longer periods had experience navigating social networks and dynamics of change in the area. These provide support to these households in times of need and other shocks that could affect them. This is in accordance with findings of Dietz *et al.,* (2014).

Socio-Economic Determinants of Food Insecurity in Integrated Households

The Tobit regression result for the determination of socioeconomic variables influencing integrated household food insecurity level revealed significant socioeconomic variables that influence household food insecurity. The variables include; age, marital status household duration of stay in the community, years of education, sex, diversification of income sources and annual income. These variables were established to have varying degrees of influence on integrated household food insecurity level as indicated by the signs and level of significance of the associated coefficients.

Table 2: Distribution of Integrated Household Size based on Food Insecurity Response as Mild, Moderate and Severe

Variables	Food Secure	Mild	Moderate	Severe
Slope	0.000	0.523	0.77	0.8683
HMDR (%)	0.31	52.01	58.17	41.02
HMFIL (%)	0	30.60	50.02	71.24
HMFIL/HMDR	-	0.588	1.163	1.736
HFIR	-	0.307	0.895	1.507
HIS	11(2.93%)	20(5.32%)	104(27.66%)	241(64.09%)

Source: Field Survey 2018

The result from Table 2 reveals that the estimated slopes obtained from the ratios of changes in household food insecurity levels (HFIL) and dependency ratio for mild, moderate and severe were progressively increasing in order of 0.532, 0.770 and 0.868 for integrated household size of 5.32%, 27.66% and 64.09% respectively. This means that changes in food insecurity levels as a result of changes in dependency ratios were all positive and increasing in magnitude with increasing levels of severity with increasing integrated household size. Implying that severity of integrated household food insecurity increases with increase in integrated Household size. The Household Mean Food Insecurity Level (HMFIL) which is the estimated food insecurity level per integrated household size were also increasing with respect to severity of food insecurity as 52.01, 58.17 and 41.02 for Mild, Moderate and Severe integrated households. The Household Mean Dependency Ratios (HMDR) were also estimated and found to be increasing as 41.02, 52.01 and 58.17 for mild, moderate and severe integrated households. Meaning increase in Integrated household Size increases dependency ratio, thereby increasing the severity of food insecurity among the integrated household. However, food secure integrated household had 0 slopes with 0.31 and 0.00 for HMDR and HMFIL. This implies that severely food insecure household had the largest Household six (64.09%) with largest food insecurity coefficient of 1.506, meaning that, those with larger integrated households have more than proportionate change in response in dependency ratio to changes in food insecurity levels. This signifies a marginal increase in dependency ratio could result to more than proportionate increase in food insecurity level while moderately food insecure households have equal response to food insecurity due to changes in dependency ratio. This is interpreted as a marginal change in dependency ratio result to approximately equal change in the level of food insecurity. Thus, any increase in household membership X translates into an increase in the magnitude of the FIR coefficient. This findings are in line with Widayaningsih,(2016), and Ali (2019).

Table 3: Determinants for Integrated Household Food Insecurity Level (n = 376)

Variables	Coefficient	Standard Errors	t Value	P > | z |
Age	0.2363	0.1185	1.99	0.046*
MStatus	-6.2110	3.6470	-1.70	0.089NS
Sex	9.04e-06	2.74e-06	3.30	0.0010***
H.Size	8.39e-02	3.45e-02	3.94	0.0050***
Yrs.educ	-2.3816	1.2998	-1.83	0.067NS
DIsource	-0.0498	0.0136	-3.66	0.000 ***
HDStay	-0.07398	0.0351	-2.10	0.035**
Aincome	-16.5710	4.2499	-3.99	0.010***
Constant	59.7898	10.3628	5.76	0.0005***

Log likelihood -1643.02

LR chi 2(7) = 27.11

Prob >chi2 0.0003

Note: *** Significant at 1%, ** Significant at 5%, * Significant at 10%,
A=annual H=household, D=duration, DI=diversification of Income, M= marrital

Source: Field Survey, 2018

Table 3 presents results of the Tobit regression analysis. Most of the coefficients of the socioeconomic variables were negatively associated (except age, sex and Integrated Household Size) and significant at various levels with household food insecurity levels. Even though, the coefficients of marital status and years of education were negative and consistent with reduction in food insecurity but were not significant even at 10% level.

The coefficient of age of household heads in the study area was positive and significant at 10% level. This indicates that, a year increase in the age of the household head increases the level of food insecurity meaning that the older the household head, the more food insecure the household is. Furthermore, the coefficient of sex of integrated household heads was also positive and significant at 1% level.with a higher proportion being male (97.9%), indicating low variations in integrated household heads as sex of integrated household head change. However, increase in low level education, income and lack of remittance from external source of male-headed household increases integrated household food insecurity level by 9.04e-06 probably their female-headed counterpart were free from those characteristic.

Years of education coefficient shows a negative but insignificant relationship with integrated household food insecurity level. This entails that increase in years of education of household heads would not have effect on household food insecurity.. This result is indicative of the low (89.8%) level of household educationalist attainment on one hand and on the other, the low

number of them that could access any white-collar employment that requires educational certification. Although civil service was the highest employer (49.2%) of labour according to the findings of this study, it is instructive that the affected persons only occupy lower positions as suggested by the analysis on educational attainment. According to the analysis, only 11.2% of households studied had tertiary education, a level that would afford the affected person to secure a reasonable appointment.

Diversification of income sources was negatively related to integrated household food insecurity and significant at 1% level. This means as household heads have more income sources, their food insecurity situation improves. The implication is that as households earn more; their ability to overcome household's food needs improves due to increased purchasing power. Findings of this study have attested to the fact that average income (₦776.60) of households with more than one income source was higher than that of the sample average (₦359,376).

The coefficient for duration of stay was negative and significant at5% level, implying that integrated households that lived in the area for a longer period were relatively food secure than those with shorter duration. People that stay longer in an area are likely to have built social networks that they can rely on in case of emergency.This is in agreement with the observation of (Martin et.al,2004) that literature on food insecurity shows social networks provide strong support for households that were faced with challenges such as being food insecure in the area for a long time.

Coefficient of household annual income, measured in naira revealed a negative relationship with integrated household food insecurity and significant at 1% level. The predicted effect of annually earned income of integrated households on food insecurity level was given by the estimated coefficient of (-16.9720), meaning that the level of food insecurity decreases with increase in annual earn income of the integrated household in the study area. This study is in line with Saleh, M.K (2018), that level of an earn income is a measure of the level of access to food and general welfare of households. Therefore, the greater the size of income, the higher the ability of households to cater for their household food needs and the lower the household food insecurity.

CONCLUSION AND RECOMMENDATIONS

The study analyzed food insecurity determinants among integrated households and concluded that majority of these households were headed by male with low level of western education, income, undiversified sources of income, thus, unemployable in high and sustainable income generating jobs. These predisposed integrated households into vulnerability and food insecurity.

Based on the findings of this study the following are possible areas of intervention that could ameliorate the problem of food insecurity among these households:

1. Household income can be enhanced through provision of professional training in various income generating activities. Therefore, investment in household income diversification and education could reduce the severity of food insecurity, if other economic and financial opportunities such as low interest loan for integrated household members are provided for investment in small-scale businesses.

2. There exist strong relationship between integrated household food insecurity and size of household dependents. Hence there is need to

consider extending food assistance to such households with IDPs being hosted by their host relations. Emergency food assistance by the humanitarian community is usually directed to IDPs in formal and government recognized camps. This therefore advocates for inclusion of integrated households for food and livelihood assistance to reduce hardships faced by the household heads.

3. Farming households among them can be targeted for agricultural support through provision of improved inputs (including seeds, fertilizer) and technical training to improve their productivity. This will increase the households' capacity to produce their own food and reduce food insecurity.

REFERENCES

Ali I. M. (2019). Analysis of Food Insecurity Among Integrated Households of Maiduguri Metropolis: Unpublished Ph D. Thesis Department of Agricultural Economics University of Maiduguri, Maiduguri, Nigeria

Akukwe T. I. (2017). Household food insecurity and its determinant in agrariancommunity of Southeastern Nigeria. Journal of tropical Agriculture, Food,Environment and Extension Vol. 19-1 Pp54-60

Akinola A. A., and Young, D., (1985). Farmers Participation in the National Accelerated Food Production project (NAFPP) in Nigeria Systematic Approach. Book Review Conservative Tillage. Frank M. D'ltri (ed), institute of water resources and Department of Fisheries and Wild Life Michigan State University U.S Louis Publishers Inc. **20:**(4) 1-384

De Muro, P. , and Burchi, F. (2007). Education for Rural People: A Neglected Key to Food Insecurity. Department of Economics-University Roma Tre.

Dietz, T., Foeken, D., Soeters, S., & Klaver, W. (2014). Agriculturaldynamics and food security trends in Kenya. In DevelopmentalRegimes in Africa. London, UK: Overseas Development Institute

Displacement Tracking Matrix (DTM). (2018). A Special Report on BH Displaced Persons in Nigeria and other Neigboring Countries: Chad, Cameroon and Niger Republic. Pp 1-45

Food and Nutrition Technical Assistance III Project (FANTA) (2007).| FHI 360 https://www.fhi360.org/.../food-and-nutrition-technical-assistance-iii-project-fanta

Maurice M., Moses, W. N., Caroline, W. K., Ngianga-bankwin. K. (2016). The Effect of Education on Household Food Insecurity in two urban settlement in kenya: A longitudinal Analysis Published with open access at springer.com 8:743-756

Mutiah, S., & Istiqomah, I. (2017). Determinants of Household Food Security in Urban Areas. JEJAK: Jurnal Ekonomi Dan Kebijakan, 10(1), 103-120. doi:http://dx.doi.org/10.15294/jejak.v10i1.9130

National Population Commission (NPC)(2006). Population census data Borno State, Federal republic of Nigeria officially Gazatte, National and State provisional Total census. Printed and published in 2007 by the Federal Government Printer, Lagos, Nigeria.

Nurideen A. M. and shaufique F. B. (2017). Analysis of Food Security Determinants among Households in Nigeria. Pakistan Journal of Nutrition Vol. 10 (11) Pp1042-1052

International Committee of Red Cross (ICRC) (2016). The assement of impact of Insurgency on Displacement Persons in Northern Nigeria. Specialbiennial record.

InternalDisplacement Monitoring Centre (IDMC) (2016). Http//www.internal-displacement.org/sub-saharan-africa/nogeria/figure-analysis

International Organization for Migrations (IOM) (2016). The Assessment of the impact of Insurgency on Displacement Persons in Northern Nigeria. Special biennial record.

Kumba, J.K., Wegulo, F. and otieno, J., (2015). The Impact of Socio-Economic Characteristics on Cash and Food Crop Production: Implication on Household Food Situation in Kisii Central Sub-Country. Kenya. Developing country Studies **5**(5)Pp115-122

Saleh, M.K (2018).Food Security and Productivity among Urban Farmers in Kaduna State, Nigeria. https://dx.doi.org/10.4314/jae.v22i1.15

Sani S. (2018). Analysis of Food Insecurity and it's coping mechanisms in Northern Nigeria.

Silvestril , S., D. Sabine, K. Patti, F. Wiebke, R. Maren. Lanetta, Q. F. Carlos, H. Mario, N. Anthony, N. Nicolas, M. Joash, C. Lieven and R. M. Cristina (2015). Household and Food Security: lesson from food secure household in East Africa. *Agriculture and food security,* 4(23): 6 – 14.

Widayaningsih, Neni and Barokatuminalloh. (2016). Strategy of increasing food security based on macro and micro aspects. JEJAK: Jurnal Ekonomi dan Kebijakan, Vol. 9(1): 111-128.

World Bank (2006). A Conceptual Review of Household Food Insecurity: Concepts and Principles: A Draft Technical Discussion Paper for Indicators and Measurements: Review. New York and Rome Pp18-25.

World Food Program (2016). Northeastern Nigeria Annual Food Security Report. 35P.

Yamane, T. (1967). *Statistics: An introductory Analysis*, 2nd edition, New York: Harper and Row. 860P.