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**DETERMINANTS OF LIVELIHOOD STRATEGIES OF FARMING HOUSEHOLDS AFFECTED BY BOKO HARAM SHOCK IN JERE
 LOCAL GOVERNMENT AREA OF BORNO STATE, NIGERIA**

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Abstract

This study examined the analysis of livelihood strategies of farming households to Boko Haram shock in Jere local government area of Borno State, Nigeria. Primary data were collected from 358 households which were randomly selected across Jere and administered structured questionnaire. Descriptive statistics and multinomial logit regression models were used for the data analysis. The result shows that majority (71.4%) of the respondents were male, 78.4% were married and the mean age is 39 years. The result also revealed that all the respondents have passed through a form of education and majority (87.7%) of the respondents were farmers. Three main livelihood strategies were identified and described (On-farm, Off-farm and Non-farm strategies), 40.6% of the households are into combination of all the three livelihood strategies. The result also indicates that household size, marital status, highest level of education, income and contact with development agents were the determining factors for households' choice of livelihood strategies in the study area. In conclusion, insecurity has occasioned that the agricultural sector alone cannot be relied upon as the core activity for households as a means of improving livelihood and reducing poverty in the study area. It is evident that, livelihood diversification is gaining prominence in households' income and poverty reduction.

Keywords: Livelihood Strategies, Farming Households, On-farm, Off-farm, Non-farm, Boko Haram,

Introduction

The problem of poverty in Nigeria is synchronous with increasing pace of insecurity and dwindling economic growth. In recent years, Boko Haram insecurity has attempted to exploit the Northern region's low level of agricultural activities, infrastructure, public services, and security.

According to United Nations High Commission for Refugees, the North-eastern Nigeria has witnessed several violent attacks since 2009 which have claimed lives and properties (UNHCR, 2014). Destruction of properties worth billions of naira and the consequence of which is the displacement of people, destruction of economic activities and social infrastructure and most importantly aggravating an unsecured livelihood among households.

According to recovery and peace building assessments (RPBA, 2018). Boko Haram attacks have affected all aspects of life, from economic growth to access to basic services, and resulted in the North's growing isolation most especially Borno State which is the main focus of this research. UNDP (2018) stated that the crisis, have caused destruction of livelihoods and properties worth over \$5.9 billion, 25% of the households remain displaced, and only 14% are ready to return home.

Livelihood is a means by which a living is secured. It is the combination of activities that people choose to undertake in order to achieve their basic human needs. As indicated by Chambers and Conway (1992) a livelihood comprises the capabilities, assets (including both material and social resources) and activities required for means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the resource base (Carney, 1999). Access to livelihoods is very limited in the worst affected areas by insurgency in the north east part of Nigeria. Also, conflict is preventing people from assessing their fields of agricultural activities, and limits access to agriculture-related wage labour (FEWNET, 2015). Most households rely on income from casual labour and petty trade, non-governmental organizations and community assistance. This study, thus intends to look at poverty status of farming households in Borno State at micro level and investigate how they adapt to shocks and stress resulting from insecurity and other naturally induced factors.

Violence perpetrated by the Boko haram extremist group since 2009 has severely affected Borno State. The consequences of the insurgent group in Borno State, such as destruction of lives and properties, are serious issues that cannot be over emphasized. The group's incessant bombings and other activities no doubt impacts negatively on lives of the people in the affected areas, thus depriving farmers of their livelihoods as they seek refuge in safe areas. Most farmers in Borno State hardly go to farms for the fear of being

ambushed and as a consequence, they tend to farm proximally to their dwelling most especially in the Jere cluster. Even where farmers are still able to produce, they face difficulties moving their harvest to the towns and cities where they are in demand because insurgents have sabotaged transportation infrastructures, and vehicles traveling on remote roads risk being attacked. This has resulted in widespread displacement and a growing humanitarian emergency, which led the inhabitant of the state to lost most of their livelihood capital thereby negatively affecting their adaptive capacity in an event of shock.

Furthermore, considering the fact that Boko haram insurgency has led to great consequences on farming households' livelihood, there is therefore a serious need to understand what implications such violence has on their poverty status and livelihood adaptive capacity. Obviously, there are some studies on poverty (Garba, 2006, Masood & Nasir 2010, Robinson & Carson 2016) but the impact of Boko haram on the livelihood of farming households in Jere is not given much attention. Thus, this current research is set to bridge the gap. Therefore this study aimed to describe the various livelihood strategies, effects of Boko haram on the livelihood and to examine the factors influencing households' choice of livelihood options of the respondents and the constraints faced by the respondents.

Methodology

Description of the Study Area

The study was conducted in Jere Local Government Area of Borno State, North-east Nigeria with the headquarters of the LGA in the town of Khaddamari. Jere LGA lies between latitude 10°11'0"N and longitude 8°52'0"E with total land area of 868 square kilometers (Borno State Ministry of Land and Survey, 2006) and has an average temperature of 33°C. The average humidity level of the LGA is put at 29 percent while the total precipitation in the area is estimated at 850 mm of rainfall per annum. The projected population of Jere LGA according to National Population

Commission projection of 3.4% for 2022 will be 293,800 (NPC, 2006) inhabitants with the area hosting members of diverse ethnic groups such as the Kanuri, Hausa, and the Fulani. The Hausa language is commonly spoken in the area while Islam is the commonly practiced religion in the area.

Jere LGA has farming as the major occupation of its inhabitants and crops such as onions, cowpea and sorghum are grown in the area. Trade also blossoms in Jere LGA with the area hosting a number of markets where a variety of commodities are bought and sold by the members of the LGA. A number of domestic animals such as camels and horses are also reared and sold in the area.

Sampling Procedure and Data Collection

Multi-stage sampling technique was used for the study. The first stage involves a purposive selection of Jere Local Government Area. The second stage involves purposive selection of six (6) farming communities; this is due to large concentration of farming households' in the area. Lastly, Using Raosoft sampling calculator at 95% confidence level, margin error of 5% and response distribution of 50%, a sample size of 358 was estimated. The research employed the use of primary data. The data was collected using a well-structured questionnaire with the assistance of trained enumerators. The questionnaire contains information on socio-economic characteristics, which include age, educational status, household size, years of experience, gender, main occupation, farm size, marital status, livelihood strategies, determinants of poverty, factors influencing households' choice of livelihood options and all the constraints faced by the respondents in the study area.

Analytical Tools

Descriptive statistics such as means, frequency distribution and percentage, measures of central tendency such as mean and standard error was

employed in describing the socio-economic characteristics of the respondents, effects of Boko haram on the livelihood of the respondents, livelihood strategies options, the various factors influencing household's choice of livelihood options and the constraint faced by the respondents in Jere LGA.

Factors Influencing Households' Choices of Livelihood Strategy

Multinomial logit regression model was used to determine the factors influencing households' choice of livelihood strategy of the respondents. The households' perceptions on the livelihood strategy choices depend on the satisfaction that can be generated from it. This means that households will choose a given livelihood strategy among the alternative livelihood strategies choices that will give them maximum satisfaction or utility. Multinomial logit model is widely used technique in the analysis of polytomous response categories in different areas of socio-economic science (Wassie *et al.*, 2008). The assumption is that in a given period at the disposal of households' asset endowment, a rational household head chooses among the four mutually exclusive livelihood strategies that could offer the maximum utility. Following the work of Greene (2003), multinomial logistic regression model was used to examine the various livelihood diversification strategies engaged by the representatives of the households in Jere local government. Therefore, we have to construct a choice model where a set of independent variables determine the kind of occupation that an individual is engaged in. The multinomial logit model is specified as;

$$P(A = j) = e^{x_i \beta_j} / \sum_{j=0}^k e^{x_i \beta_j} \quad j=0, 1, 2, 3, \dots, j \dots \dots \dots (1)$$

Where;

A= 1, Agriculture strategy alone

A = 2: AG + OFF: Agriculture and off-farm combination strategy

A = 3: AG + NF: Agriculture and non-farm combination strategy

A = 4: AG + OFF + NF: Agriculture, off-farm and non-farm combination strategy

Where;

P is the probability of an economic activity,

e is natural log;

β coefficients associated with X_i independent variables

i^{th} respondents faced with j choices,

$P_{ij} = 1$, if the individual is participating in agriculture strategy choice alone;

$P_{ij} = 2$, if the individual is participating in agriculture and off-farm combination strategy and so on,

P_{ij} is the probability of an employment of the j^{th} choice;

j is the livelihood strategy that i^{th} household chooses to maximize its utility category.

Table 1: Definition of Model Variables

Dependent variable	Variable's definition
1. AG	Agriculture alone
2. AG + OFF	Agriculture and off farm combination
3. AG + NF	Agriculture and Non-Farm strategies combination
4. AG + OFF + NF	Agriculture, off farm and non-farm strategies

Therefore, following the work by Adepoju and Obayelu (2013); Samtar (2015); Yizengo *et. al.*, (2015) dependent variable for this study is the respondents' choice of livelihood strategies which are specified as follows:

On-farm strategy: refers to activity that involves crop production, livestock production, poultry production and fish rearing.

Off-farm strategy: here refers to agricultural activities which take place outside the farmer's own farm (i.e within agriculture). The activities include agricultural marketing and agricultural processing.

Non-Farm strategy: it refers to all economic activities outside agriculture.

Independent Variables

X_1 = Sex of household head (1 if female, 0 if male)

X_2 = Age of household head (in years),

X_3 = Marital status of household head (1 if married, 0 if otherwise)

X_4 = Household size (number)

X_5 = Educational status of household head (number of formal schooling)

X_6 = Contact with development agents (1 if yes, 0 if otherwise)

X_7 = Farm size (Number)

X_8 = Experienced shock (1 if Yes, 0 if otherwise)

X_9 = Income per household (₦)

Results and Discussion

Socio-Economic Characteristics of Respondents

The result (Table 2) shows that, the majority (71.4%) of the respondents in the study area were male while 28.6% were female. For Instance, male who are mostly household heads participate more in outdoor activities than female especially in the Northern part of Nigeria where this study was conducted. The advantage of the male dominance is that, the productivity level of income and livelihood diversification is expected to be higher because of their tendency to provide more labour and also involve themselves in different occupational endeavours to gain more income which could be triggered for them to invest leading to additional income streams. Adeleke *et al.*, (2020) informally asserted that sex of the population determines the income in a larger extent as the wage paid to

male wage earners is comparatively higher than that of female which again reveal the difference in the livelihood diversification and investment possibilities among the population.

The distribution of marital status of the respondents is presented in Table 2. The results reveal that, the majority (78.4%) of the respondents in the study area were married, the lowest proportion (2.2%) were divorced. This is in agreement with (Ekong, 2003) who perceived marriage as a very essential factor that determines household size and processing activities. Marital status played a vital role on household needs; a married household head is likely to have large household size and hence will diversify his or her income source to carter for the livelihood needs. Culturally and religiously, typical people in this part Nigeria get married at younger age (KSFPD, 2008). The education distribution of the respondents (Table 2) shows that adult education constituted the least proportion (5.6%) amongst the respondents in the study area, while majority (59.7 %) of the respondents had secondary education. The result shows that majority of the respondents in the study area are literate; the high level of education can enhance their decision to adopt new livelihood strategies which can be used in combating poverty. Education is globally considered as very important enhancer for mitigating poverty. The level of education of an

individual usually enhances his social and economic decisions for optimum performance and efficiency (Bishir, 2011).

The distribution of contacts with development agents of the respondents is also presented in Table 2. The result shows that the majority (55.5%) of the sampled population had no contacts with development agents in contrast to 44.5% of the population who had contacts with the development agents. The implication of this result is that poverty may be more in the households who do not have access to the developmental agents than those who had access. This may be due to the fact that households who had more access to developmental agents may have better knowledge of how to diversify their livelihood income, thereby improving their welfare and reducing poverty. These developmental agents include government agencies, non-governmental organizations, faith related organizations etc.

The distribution of main occupation of the respondents was presented in Table 2. The results show that, the majority (87.7%) of the respondent were farmers, whereas 2.8% choose other option in the study area which includes agricultural products marketing and processing.

Table 2: Socio-Economic distribution of Qualitative Variables

Socio-economic Variables	Frequency	Percentages
Sex		
Male	255	71.4
Female	102	28.6
Marital status		
Married	280	78.4
Single	41	11.5
Widowed/widower	28	7.8
Divorced	8	2.2

Highest level of Education		
Primary	66	18.5
Secondary	213	59.7
Tertiary	18	5.0
Informal education	40	11.2
Adult education	20	5.6
Contact with development agents		
Contact	159	44.5
No-contact	198	55.5
Main occupation		
Farming	313	87.7
Trading of Agricultural Commodities	34	9.5
Source: Field Survey, 2021 n=357		

Age is an important factor that affects choice of livelihood strategies and also affects nation's key socio-economic issues which can be used to predict potential political issues (FAO, 2008). The age distribution of the respondents is presented in Table 3. The results shows that a reasonable proportion (38.9%) of the respondents in the study area were within the age bracket of 25-33 years and the lowest (2.8%) fell within the ages of 61-69 years. The minimum, mean and maximum ages in the study area were 25, 39 and 69 years respectively. The majority of the household heads fell within the active age range (between 25-50 years) defined by FAO (1992) as economically productive in a society implying that interviewed respondents have the potential to engage in various income generating activities which connotes livelihood diversification.

The distribution of households' size of the respondents as presented in Table 3, shows that, the majority (64.7%) of the respondents had 1-6 persons in their residents and the lowest proportion (0.6%) had 25-30 persons in the households. The minimum household size is 1 and the mean is 5 and the maximum is 29 persons in their residents and this also

underpins the findings by Bishir (2011) who opined that, larger family members is commensurate with the polygamous nature of the society. Household size indicates the number of people or the size of the family that are under the control of the respondents. They are members of the family living together and feeding from the same pot. The result implies that majority of the households in the study area had reasonable number of individuals who share household resources and we also assume that the larger household size that are economically active is expected to translate into labour availability and involvement in income generating activity. So, the number of household size is expected to have positive impact on the level of income diversification of households. The findings of farm size also revealed that more than half of the respondents (59.1%) had farm size between 0.4-2.7 hectares, indicating that the study area constitutes more of subsistence or smallholder farmers. Although 9% had farm size above 10 hectares indicating the potential of agricultural commercialization if adequate resources are mobilized. It is important to note that, if this aspect of the farming household is principally harnessed, it can serve as an important tool to fight poverty as this is not a deviation from the primary

livelihood but a buffer to improve their wellbeing owing to their various characteristics in the study area. This represents the monthly income distribution of household in the study area. The result also in Table 3 shows that the majority (67.2%) of the households earned within the range of ₦6,000- ₦113,999 per month, whereas only a minority (32.8) of the

sampled population earned above ₦113,999. The result simply explains that the majority of households' heads are low-income earners. Thus, there is need for the households administered questionnaire to diversify their means of livelihood in order to earn more and also fight poverty in the study area.

Table 3: Socio-Economic Distribution of Quantitative Variables

Socio-economic Variables	Frequency	Percentages	Minimum	Mean	Maximum
Age					
25-33	139	38.9	25	39	69
34-42	106	29.7			
43-51	66	18.5			
52-60	36	10.1			
61-69	10	2.8			
Household Size					
1-6	228	64.7	1	5	29
7-12	106	29.7			
13-18	9	2.5			
19-24	9	2.5			
25-30	2	0.6			
Farm Size					
0.4-2.7	211	59.1	0.50	3.7	50
2.8-5.1	60	26.9			
5.2-7.5	8	2.2			
7.6-9.9	10	2.8			
10 and above	32	9.0			
Total Income					
6,000-113,999	247	67.2	6,000	115,375	570,000
114,000-227,999	71	21.9			
228,000-341,999	19	5.3			
342,000-455,999	11	3.1			
456,000-570,000	9	2.5			

Source: Field Survey, 2021

n=357

Livelihood Strategies

Three main livelihood strategies were identified and used for the purpose of this study are on-farm, off-farm and non-farm strategies. Multinomial logit model was employed for this study to estimate the effect of hypothesized explanatory variables on households' choice of livelihood strategies. Three main livelihood strategies were identified and described dependent variable. These were; Agriculture (on-farm), Off-farm and non-farm. The results shows that almost half (40.6%) of the farming households were into the three livelihood strategies (agriculture/off-farm/non-farm) strategies. 23% were into agriculture and off farm income strategies, 12% were into agriculture and non-farm strategies and only

24.4% were still into agricultural strategy alone. This implies that only 24.4% of the respondents are still into on-farm agricultural activities, the rest 75.6% are into agriculture (on-farm) with combination of other strategies and this can be due to the threat by Boko haram insurgents which caused restrictions to farming activities, this have forced the people in Jere who were predominately farmers before the insurgency to add more livelihood strategy options in order to cater for their daily needs. The high contribution of off-farm and non-farm income to total households' income was due to insecurity that is being faced by the farming households in the study area, households that were predominantly farmers, now have to go for other alternatives due to inaccessibility of their farmlands.

Table 4: Choice of Livelihood Strategy of the Respondents

Choice of livelihood strategy	N	Percentage
Agriculture	87	24.4%
Agriculture and off-farm	82	23.0%
Agriculture and non-farm	43	12.0%
Agriculture, off-farm and nonfarm	145	40.6%

Source: Field Survey, 2021 n=357

Determinants of Choice of Livelihood Strategy

The result indicates that marital status, highest level of education, household size, contact with development agents and income were the determining factors for households' choice of livelihood strategies in the study area (Table 5). However, the magnitude effect of some significant variables is not similar for the three livelihood strategies. Some may be highly significant to affect the choice of a strategy and may be insignificant for the other. Therefore, multinomial logit analysis results indicate selection of each of the livelihood strategy is affected by different factors and at different levels of significance by the same factor in some cases (Table 5). It has to be noted that the multinomial logit estimates are

reported for three of the four categories of livelihood strategies choice. The first alternative (i.e. selecting farming only) was used as a benchmark alternative against which the choice of the other three alternatives was seen. The plausible implication and marginal effects of the significant explanatory variables on the choice of households' livelihood strategies are presented as follows;

The result indicated that marital status of household head influenced positively and significantly the choice of on-farm and non-farm combination at 5% probability level. This study indicates that a married household head is more likely to diversify his or her livelihood strategy

this can be due to the fact that as someone gets married the household size may increase, and households' demands will also increase. This result supports the prior expectation, that married household heads participate more in on-farm and non-farm activities because they will have more people to feed and there is need for them to diversify their means of livelihood (Ellis, 2005). The probable justification for positive association is that as someone get married, households have more chance to have children, this in turn help to have available labour to engage in diverse activities. The second reason, the increment in the number of children may result in more family members and this can create more demand for basic necessities. This situation, therefore, may force household to engage in diversified livelihood strategies in order to meet up with the basic needs of the family (RPBA, 2018).

As the model result indicates, the variable education had positively and highly significantly influenced the household choices of on-farm and off-farm activities at 5% probability level (Table 5). This finding indicates that those households head with high educational level are more likely to diversify livelihood strategies into non-farming and/or off-farming activities than the uneducated ones. This is due to most probably educated person gain better skill, experience, knowledge and this again help them to engage in a more diversified livelihood means. Literate individuals are very ambitious to get information and use it.

The result also shows that income is significant at 1% for choice of on-farm and off-farm combination. This implies that households with low income need to diversify their means of livelihood in order to meet up with

their daily demands. So there is need for them to diversify into on-farm and off-farm combination and other strategies in the study area.

Those that have contact with development agents as expected, was found to have positive and significant influence on livelihood diversification into combination of on-farm (agriculture) + off-farm strategies at 5% probability level (Table 12). This result implies that households which have had contacts are more likely to diversify their livelihood strategies into on-farm and/or off-farm combination. On other word, this result shows that those households that had no contact with development agents are less likely to diversify livelihood strategy.

As the model result indicates, the variable dependents (household size) had positively and significantly influenced the household choices of on-farm + off farm, on-farm + non-farm and on-farm + off-farm + off farm activities at 10%, 5% and 1% probability level respectively. This finding indicates that those households with high number of dependents are more likely to diversify their livelihood strategies into on-farm + off farm combination and/or off-farm + non-farm and also on-farm + off-farm + non-farm combination of activities than those with a lower number (Table 5). This is due to the fact that the higher the number of people living with you, the more people that you will have to feed; as the number increases there is need to diversify into other livelihood since there is restriction to agricultural activities in some part of Borno State, most especially in Jere Local Government Area.

Table 5: Determinant of Households Choice of Livelihood Strategy

Variable	On-farm and Off farm			On-farm and Nonfarm			On-farm, Off-farm and Nonfarm		
	Coeff	S.E	Sig.	Coeff	S.E	Sig.	Coeff	S.E	Sig.
Sex	-.069	.386	.857NS	.386	.426	.365NS	.332	.331	.315NS
Age	-.011	.015	.436NS	.003	.016	.836NS	-.009	.012	.440NS
Marital Status	-.156	.215	.469NS	-.693	.331	.036**	-.210	.188	.264NS
Household Size	.094	.053	.076***	.121	.057	.034**	.154	.047	.001*
Level of Education	-.373	.159	.019**	-.111	.176	.530NS	-.007	.126	.955NS
Contacts With Dev. Agent	-.708	.335	.034**	.077	.381	.840NS	.022	.283	.937NS
Farm Size	.050	.032	.124NS	.012	.040	.773NS	.007	.033	.826NS
Experienced Shock	.623	.449	.165NS	-.539	.460	.242NS	.031	.373	.934NS
Total income	.000	.000	.004*	.000	.000	.991NS	.000	.000	.135NS
Nagelkerke	.300								

Reference Category: Agriculture * Significant at 1%. ** Significant at 5%, ***Significant at 10%, NS = not significant.

Constraints

Various constraints were found militating against choice into diversifying into any income generating activity. The results revealed that households were affected by several constraints and challenges which include inadequate infrastructural facilities, Insecurity, high cost of living standard, high rate of unemployment, inadequate start-up capital as shown in Table 6. The result shows that inadequate infrastructural facilities

(73.4%) was ranked 1st as the most important problem affecting the farming households in the study area. Access to infrastructure such as electricity, running water, roads, local public transport can lower poverty intensity than those that had less access. The issue of insecurity (55.2%), high cost of living (10.1%), high rate of unemployment (2.2%), inadequate start-up capital (1.4%), was ranked 2nd, 3rd, 4th and 5th respectively.

Table 6: Constraints faced by the Households in the Study Area

Variable	Frequency*	Percentage (%)	Rank
Inadequate Infrastructural Facilities	262	73.4	1 st
Insecurity	197	55.2	2 nd
High cost of living standard	36	10.1	3 rd
High rate of unemployment	8	2.2	4 th
Inadequate start-up capital	5	1.4	5 th

Source: Field Survey, 2021, n=357 *Multiple responses recorded hence percentage total >100%

Conclusion

Based on the findings of the research, it can be concluded that that conflict /insecurity has occasioned that the agricultural sector alone cannot be relied upon as the core activity for households as a means of improving livelihood, achieving food security and reducing poverty in the study area. It is evident that, livelihood diversification is gaining prominence in households' income and poverty reduction.

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