PERENNIAL CONFLICT BETWEEN FARMERS AND HAUSA/FULANI HERDSMEN: IMPLICATIONS ON FOOD SECURITY IN NIGERIA

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ABSTRACT
The incessant attacks of herdsmen on farmers have underscored the need for continuous information on food security of farm households, to make for appropriate planning and implementation of interventions. Consequently, the study examined the implications of the perennial conflicts between farmers and Hausa/Fulani herdsmen on food security in Nigeria. The study utilized primary data collected from 210 farm households from seven villages in southeast Nigeria where herdsmen attacks on farm households have been severe. Descriptive statistics, food security index and logistic regression were used in data analysis. The result showed that the average age of the heads of the farm households was 48years, 64% of them were males, 77% were married with mean household size of 12 members. The annual farm and non-farm income were ₦387,542.30 and ₦132,400.25 per household, respectively. The average number of herdsmen attack was four times in 2016, with an average of 2.3ha of farmland destroyed per household. The food security line of the farm households was ₦2,533.79 per month. About 45.7% of them were food secure, while 54.3% were food insecure. The logit regression showed that the food security status of farm households were significantly affected by sex, marital status, size of farmlands destroyed, attack on farmers' homes by herdsmen and migration of people away from communities. The study recommended the establishment of grazing reserves and prohibition of open grazing, and the professionalization of agricultural production.

KEYWORDS: Hausa/Fulani herdsmen, Farm households, Conflict, Food Security

INTRODUCTION
Agriculture plays important role towards food security in sub-Saharan African (SSA). In the region, agriculture is the major livelihood activity, serving as the swivel for the region's economy (Food and Agriculture Organization [FAO], 2015). It provides food for the increasing population; supply of adequate raw materials (and labour input) to a growing industrial sector; a major source of employment and income; generation of foreign exchange earnings; and provision of a market for the products of the industrial sector (Alliance for a Green Revolution in Africa [AGRA], 2014). According to World Bank (2016), agriculture on the average in 2014, contributed 15% of total GDP in the region, which varied from below 3% in Botswana and South Africa, through 20% in Nigeria, to over 50% in Chad. This is in contrast to the sector's contribution of 2%, 3%, 5%, 9% and 18% to total GDP within the same period in Canada and USA, European Union, Russia, China and India, respectively (World Bank, 2016). These underscore the sector's prioritisation in the Comprehensive African Development Programme (CADP) of the New Partnership for Africa's Development (NEPAD) (Organization for Economic Cooperation and Development [OECD] & FAO, 2016).
However, food security remains a daunting challenge for the region as majority of her populace are largely food insecure. Food security represents the absence of hunger and malnourishment. It exists 'when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy

life,' (FAO, 1996). According to the Food and Agriculture Organization of the United Na... about 217.8 million people in the region live in hunger and malnutrition, representing percent of the population in the projection for 2014-16 period (FAO, International Fund i Agricultural Development [IFAD] & World Food Programme [WFP], 2015). This prevalence of under-nourishment in SSA is the highest among all the developing regions of the world, as it implies that one in every four persons is food insecure. The high level of food insecurity spreads across every segment of the region with 124.2 million in Eastern Africa, 58.9 million in Middle Africa, 31.5 million in Western Africa and 3.2 million in Southern Africa, representing 32%, 41%, 9% and 5% of their populations, respectively (FAO, IFAD, & WFP, 2015).

The situation is even worse in Nigeria with its approximately 184 million inhabitants, representing 47% of the population of West Africa and which has one of the largest population of youths in the world (World Bank, 2017). The report of the 2015 State of Food Insecurity in the World, shows that Nigeria has the largest number of under-nourished people in SSA estimated at about 12.9 million, besides 16.8 million in United Republic of Tanzania and 31.6 million people in Ethiopia, both in Eastern Africa (FAO, IFAD, & WFP, 2015). This underscores the commitment of successive governments and administrations in Nigeria towards improving food security in the country through increased agricultural production and productivity. This will have far reaching implications in the reduction of hunger, malnutrition and poverty in SSA.

However, the perennial conflicts between herdsmen and farmers over the ownership, control and use of land and land resources such as grasses and water constitutes a major obstacle to the path of food security in the country. Security is the bedrock of development, as no meaningful agricultural production (economic) activity can take place in the midst of feuds and conflicts. FAO (2006) reported that 60% of the total number of hungry, malnourished and food insecure people in SSA occur in countries where there are conflicts. Also, extracts from the 2015 State of Food Insecurity in the World suggest that countries that met the Millennium Development Goal One (MDG 1) target of reducing by half the number of people who suffer from hunger by 2015 enjoyed relative peace and stable political conditions, overall economic growth and expanded their primary sectors mainly agriculture, fisheries and forestry. Nigeria met this target, but fears are rift that this could reverse, if the incessant conflicts between farmers and herdsmen are not appropriately addressed through evidence-based policies.

The herdsmen in Nigeria who are mainly from the Hausa/Fulani tribe rear their herds especially cattle, but also, sheep and goat through extensive management system. This system is nomadic, as it involves the movement of herds from one place to another in search of grass and water by the Hausa/Fulani herdsmen. Farmers on the other hand, are every where in the country cutting across regions and tribes, and are mainly involved in the cultivation of land for crop production. They also rear livestock only to augment family food and income. Farmers' activities are sedentary in nature, as they reside in one place which most of the time are their places of origin. The activities of the herdsmen whose herd most of the time graze on farmlands bring them in contact with farmers, resulting in conflicts.

There is therefore the need for evidence-based policies that will help to nip at the bud the rising trend of conflicts between herdsmen and farmers, in order to ensure food security in Nigeria and the entire sub-Saharan Africa. Such policies that address the effect of these conflicts on food security have not been well reported. Most studies on food security in the region did not take into cognisance, security challenges posed by herdsmen attack on farmers. Herdsmen-farmers conflict are site-specific phenomenon requiring local level analyses in order to gain better insight and understanding. Consequently, the following research questions were addressed: what is the food security status of the farmers and how is it affected by factors arising from herdsmen attack? This will make for effective policy development and

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implementation by national and local governments, non-governmental organizations and bi-lateral donors, towards achieving sustainable food security in the sub-Sahara Africa.

METHODOLOGY

This study was carried out in southeast Nigeria. Data were collected with the aid of well-structured questionnaire administered to 210 farm households. Purposive sampling technique was employed to select Enugu State for the study because of the frequency and severity of Hausa/Fulani herdsmen attack on the farming communities relative to other states in the region as shown in Table 1 ("Bloodbath in Enugu as Fulani herdsmen kill 40," 2016; Eyekpi, 2016; Michael, Inyany, & Ukpong, 2017). Thereafter, seven villages in Ukpabi Nimbo community in Uzo-Uwani Local Government Area (LGA) were purposively selected because they have been at the centre of most of the herdsmen attack in the state as shown in Table 1 ("Bloodbath in Enugu as Fulani herdsmen kill 40," 2016; Eyekpi, 2016; Michael *et al.*, 2017). These villages included: Ekwuru, Nimbo-Ngwoko, Ugwuijoro, Ebor, Enugu-Nimbo, Umuome and Ugwuachara. Lastly, thirty (30) farm households were randomly selected from each of the seven (7) selected villages in the study. This was to give the villages equal representation in the analysis.

Table 1: Cases of Fulani herdsmen attack on farming households in Southeast Nigeria

S/n	Date	State	LGA	Community	No. of victims
*1.	01/01/16	Enugu	Nkanu East	Nkanu	1
*2.	11/02/16	Enugu	Uzo-Uwani	Nimbo	2
*3.	17/03/16	Enugu	Udi	Udi	1
4.	16/04/16	Anambra	Ayamelum	Ayamelum	1
*5.	25/04/16	Enugu	Uzo-Uwani	Nimbo	57
*6.	27/04/16	Enugu	Uzo-Uwani	Nimbo	20
7.	09/05/16	Anambra	Oyi	Azu Ogbunike	n.a
8.	15/07/16	Abia	Obingwa	Abala	n.a
9.	13/08/16	Imo	Ideato	Akokwa	2
*10.	25/08/16	Enugu	Nkanu West	Attakwu	3

* - Enugu State; n.a - not available
Source: compiled from "Bloodbath in Enugu as Fulani herdsmen kill 40," 2016; Eyekpi, 2016; Michael *et al.*, 2017.

Descriptive statistics, food security index and logit regression were used to analyze the data. The food security index is specified below:

$$F_i = \frac{\text{per capita food expenditure for the } i^{th} \text{household}}{2/3 \text{ mean per capita food expenditure of all households}} \tag{1}$$

where:

F_i = food security index $\left(\begin{array}{l} \text{Fi} \geq 1 = \text{food secure } i^{th} \text{ household; } F_i < 1 = food \\ \text{insecure } i^{th} \text{ household} \end{array}\right)$

This method has been widely applied in determining the food security status of farmers (Irohibe & Agwu, 2014; Otunaiya & Ibidunni, 2014; Oyebanjo, Ambali, & Akerele, 2013). A household is food secure when its monthly food expenditure is equal to or above two-third of the mean of per capita food expenditure of all households in the study. The household is food insecure when the household's monthly food expenditure is less than two-third of the mean monthly food expenditure of all the households in the study.

The binary logit regression is specified as follows:

$$Pr[Y_j = 1/X_j] = \frac{1}{1 + \exp(-\beta_0 - \beta_j X_j)} \tag{2}$$

$$Pr[Y_j = 0/X_j] = 1 - Pr[Y_j = 1/X_j] \qquad (3)$$

where:

F_i = 1, if household is food secure, 0 if otherwise

X_1 = sex (1 if male, 0 if female)

X_2 = marital status (1 if married, 0 if otherwise)

X_3 = age (years)

X_4 = household size (number)

X_5 = level of education (years)

X_6 = farm experience (years)

X_7 = farm income (₦)

X_8 = non − farm income (₦)

X_9 = size of farmland destroyed (ha)

X_{10} = attack on farmers' homes by herdsmen (1, if attacked, 0 if otherwise)

X_{11} = number of household members who have migrated out of the village in the last 2years as a result of herdsmen attack

X_{12} = loss of interest in farming (1 if yes, 0 otherwise)

X_{13} = contamination of water sources (1 if yes, 0 otherwise)

X_{14} = lack of access to market (1 if yes, 0 otherwise)

The parameters of the logistic regression model were estimated using the maximum likelihood approach. The use of logistic regression in explaining the determinants of farmers' food security status has found wide acceptance and application (Abdullahi, Hassan, & Ayanlere, 2015; Irohibe & Agwu, 2014; Otunaiya & Ibidunni, 2014; Oyebanjo *et al.*, 2013).

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Farm Households

The socioeconomic characteristics of the farm households are shown in Table 2. It showed that majority (64%) of the households were headed by males, while their average age was 48years. Furthermore, the result showed that only about 5% of the farmers were single compared to 77% who were married and 18% who were widowed, while their average household size was 12 persons. The average annual farm income of the households was ₦387,542.30 from all their farm holdings, with majority of them (39%) having an annual farm income range of ₦301,000 - ₦400,000 from all their farm holdings.

Food Security Status of Farm Households

The food security status of farming households is shown in Table 2. The result showed that the food security line of the farm households was ₦2,533.79 per month. This implies that farm households whose mean per capita food expenditure was less than ₦2,533.79 per month were food insecure, while those with mean per capita food expenditure greater than or equal to ₦2,533.79 per month were food secure. The result further show that 45.7% of the households were food secure, while a greater majority (54.3%) were food insecure. Further result showed that the mean per capita food expenditure of food secure households was ₦6,870.82 per month, compared to ₦1,215.30 per month for food insecure households. The implication of this is that mean per capita food expenditure of food secure households per month was 5.65 times more than those of food insecure households. This is similar to the findings of Ibok et al. (2014). It reflects high rate of income inequality, contrary to the expectation that income distribution in rural areas should be more even compared to urban centres.

Table 2: Distribution of the respondents according to their socioeconomic characteristics

Socioeconomic variables	Frequency	Percentage	Mean
Gender: Male	135	64.29	
Female	75	35.71	
Age: < 30years	14	6.67	
31-40years	42	20.0	
41-50years	70	33.33	**48.41**
51-60years	54	25.71	
> 60years	30	14.29	
Marital status: Single	10	4.76	
Married	162	77.14	
Widowed	38	18.10	
Household size: 1 - 5	25	11.91	
6 - 10	52	24.76	**11.82**
> 10	133	63.33	
Educational level: < 1year	37	17.62	
1-6years	84	40.0	**6.93**
7-12years	68	32.38	
13-18years	21	10.0	
Farming experience: <10years	56	26.67	
11-20years	92	43.81	**18.05**
21-30years	50	23.81	
>30years	12	5.71	
Primary Occupation:			
Agriculture	199	94.76	
Non-agriculture	11	5.24	
Annual farm income:			
< ₦100000	21	10.0	
₦101000 - ₦200000	17	8.10	
₦201000 - ₦300000	57	27.14	
₦301000 - ₦400000	82	39.05	**₦387,542.30**
₦401000 - ₦500000	25	11.90	
> ₦500000	8	3.81	
Annual non-farm income:			
< ₦50000	62	29.52	
₦51000 - ₦100000	30	14.29	
₦101000 - ₦150000	78	37.14	**₦132,400.25**
₦151000 - ₦200000	32	15.24	
> ₦200000	8	3.81	
Total number of respondents	**210**		

Source: Field survey, 2016.

Table 2: Distribution of the farmers according to their level of food security

	Frequency	Percentage	Mean Monthly Expenditure (₦)
Food secure	96	45.7	6,870.82
Food insecure	114	54.3	1,215.30
Food security line		₦2,533.79	

Source: Computed from field survey, 2016.

Factors Affecting Food Security of Farm Households
The maximum likelihood estimates of factors affecting the food security status of farm households was shown in Table 3. The result showed that the food security status of the farm households was predicted with 88.6% accuracy. The log-likelihood ratio (LR) statistic (-102.84) was significant. This implies a strong explanatory power of the model. The Pseudo R^2 was 0.742 which implies that about 74% of the likelihood of a household being food secure was strongly explained by the independent variables. Furthermore, sex, marital status, household size, non-farm income, size of farmland destroyed by herdsmen, frequency of herdsmen attacks on farmers, and migration due to herdsmen attack were the factors that significantly affected the likelihood of a household being food secure in the study.

Sex
The sex of household head had a positive coefficient that was significant at 1% level. This means that male-headed households had higher probability of been food secure compared to female-headed households. The odds ratio in favour of food security increases by the factor 1.023. This means that the likelihood of households to be food secure increases by 102.3% for every unit increase in male-headed households. This is expected bearing in mind that in developing economies like Nigeria, males have more access to productive resources such as land and capital. Also, the strong physical built of males confer on them some advantages over their female counterparts, especially in agricultural production, which is highly labour intensive.

Factors affecting the food security status of farm households

Variables	Coefficients	Standard errors	Z-value	Odd ratio
Constant	-0.6578	1.2181	0.54	-
Sex	1.2001	0.3693	3.25***	1.023
Marital status	0.0041	0.0020	2.04**	0.100
Age	0.9554	0.7349	1.30	1.254
Household size	2.0011	1.1370	1.76*	1.042
Level of education	0.8299	0.9650	0.86	0.127
Farming experience	1.8254	6.5193	0.28	1.220
Farm income	0.5226	0.3226	1.62	0.867
Non-farm income	0.0048	0.0024	1.99**	1.068
Size of farmland destroyed by herdsmen	-0.0003	5.28e-5	5.68***	0.172
Attack on farmers' homes by herdsmen	-0.6265	0.3386	1.85*	0.055
Migration away from villages	-3.0229	1.1996	2.52**	1.004
Loss on interest in farming	5.5200	61.333	0.09	0.047
Contamination of water sources	0.0385	0.0770	0.50	2.564
Lack of access to market	-2.3210	0.550	4.22***	3.063
Base category	Food secure			
Total number of cases	210			
Number of cases correctly predicted	186 (88.6%)			
Log-likelihood ratio	-102.843			
Prob > χ^2	0.000			
Pseudo R^2	0.742			
Average marginal effect	0.44			

Key: ***,**,* - 1, 5 and 10% significant level, respectively.
Source: computed from field survey, 2016.

Marital Status

Marital status has a positive coefficient which was significant at 5% level. It implies that married-headed households are more likely to be food secure than unmarried-headed households. The odds ratio in favour of food security increases by the factor 0.10. This means that for a unit increase in married-headed households increases the probability of households to be food secure by 10%. In Africa societies, marriage confers a lot of rights and privileges on people. This could increase the access of married-headed households to productive resources, especially land thereby affecting their food production, productivity and security. This study is in agreement with Haliu & Regassa (2007) and Kaloi, Tayebwa & Bashaasha (2005), which reported that the likelihood of food security increases with married-headed households than unmarried-headed households in Southern Ethiopia and Mwingi District, Kenya, respectively. However, this is at variance with Aidoo *et al.* (2013) which indicated that married-headed houses were less likely to be food secure than households headed by unmarried people in Sekyere-Afram Plains District of Ghana.

Household Size

Household size has a positive coefficient which was significant at 10% level. This implies that households with larger sizes have higher chances of being food secure than households with smaller sizes. The odds ratio in favour of food security increases by the factor 1.042. Hence, a unit increase in household size increases the likelihood of food security by 104.2%. This result is against expectation because large-sized households imply more mouths to feed and hence, decreased food security. However, the households may have had more adult members than children, who contribute productively to household food security, and as such, may have been responsible for the result of this study. This finding is in disagreement with Aidoo et al. (2013), and Leza & Kuma (2015) which reported negative coefficient of household size with the probability of being food secure, respectively.

Non-farm Income

Non-farm income has a positive coefficient which was significant at 10% level. This means that the likelihood of being food secure increases with increase in non-farm income. The odds ratio in favour of food security increases by the factor 1.068, which implies that one unit increase in non-farm income increases the likelihood of households' food security by 106.8%. The result is expected because rural households have very diversified livelihood portfolios from where they generate income to support their households.

Size of Farmland Destroyed by Herdsmen

The size of farm land destroyed by herdsmen has a negative coefficient which was significant at 1%. This means that the likelihood of being food secure decreases with increase in the size of their farmlands destroyed herdsmen. The odds ratio in favour of food security decreases by the factor 0.172, which implies that a unit increase in the size of farmland destroyed by the herdsmen decreases the likelihood of a household being food secure by 17.2%. Land is a very important factor in agriculture, upon which farmers grow their crops. As such, the destruction of farmlands deprives rural households of their primary source livelihood.

Frequency of Attacks on Farmers by Herdsmen

Frequency of attacks on farmers by herdsmen has a negative coefficient which was significant at 10%. This means that the likelihood of being food secure decreases with increase in the frequency of attacks on farmers by herdsmen. The odds ratio in favour of food security decreases by the factor 0.055, which implies that for every unit increase in the frequency of attacks on farmers by herdsmen, the likelihood of being food secure decreases by 5.5%. Farmers are the primary victims in herdsmen-farmers conflicts and attacks, which results in tremendous loss of life and property. These attacks affect the socioeconomic life of the farmers, disrupt agricultural production activities thereby contributing to food insecurity.

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Migration due to Herdsmen Attacks

Migration away from communities due to herdsmen attacks has a negative coefficient which was significant at 5%. This implies that the probability of being food security decreases with increase in migration. The odds ratio in favour of food security decreases by the factor 1.004, which implies that there are about 100% decrease in the likelihood of a household being food secure for every unit increase in migration away from the communities due to herdsmen attacks. One would have expected that such migrations should increase food security since the migrants could be sending remittances home. However, these migrants may not have been well established in their new environments to start sending remittances within two years, since the onset of herdsmen attacks. This therefore is a huge economic loss to the farmers whose household members constitute the major source of labour for agricultural production.

Lack of Access to Market

The effect of lack of access to market on the likelihood of a household being food was negative and significant at 1%. This infers that lack of access to market decreases the likelihood of a household to be food secure. The odds ratio in favour of food security decreases by the factor 3.063, which implies that a unit increase in lack of access to market decreases the likelihood of a household to be food secure by 306.3%. Lack of access to market serves as a disincentive for agricultural production as market provides the medium for effective demand and supply of agricultural inputs and products. Given the pace of insecurity in the rural communities arising from herdsmen attacks, the market structures and institutions would have been considerably destroyed, imputing palpable fears in the minds of people. This will affect the ability potential customers to access the rural communities to demand for the agricultural produce of the farmers, which worsens the farmers' food security.

CONCLUSION AND RECOMMENDATIONS

Food security is a serious concern in rural communities of Nigeria as majority of farming households are food insecure. This is further worsened by recurring conflicts between herdsmen and farmers which disrupts agricultural production activities, with attendant destructions to life and property. The study recommends the establishment of grazing reserves and prohibition of open grazing, and the professionalization of agriculture.

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