

IMPACT OF HERDER-FARMER CONFLICTS ON FOOD SECURITY IN FCT, NIGERIA

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Abstract

This empirical study focuses on the impact of Herder-Farmer conflicts in FCT. Data on herder-farmer conflicts indicators were obtained through a structured questionnaire from 394 residents in three Area Councils out of the six Area Councils in FCT, namely: Gwagalada, Kuje and Kwali. The study adopts a descriptive and inferential statistical analysis using Probit Regression Model. The impact of Herder-Farmer conflicts in FCT is evident as significant explanatory variable coefficients were statistically significant except for the residents' awareness, which was found to be insignificant. From the study's findings, the herder-farmer conflicts greatly affect food security in FCT. The study recommended that Security personnel should protect the lives and property of those impacted by herder-farmer conflicts, and provide adequate security for farmers and those working in the agribusiness to allow for the easy transportation of farm products to market. The anti-open grazing rule, which forbids herders from moving their livestock in public areas, should be put into practice to resolve the herder-farmer disputes. Given their proximity to the herder-farmer conflict's victims, state governments ought to be trusted with finding a solution.

KEYWORDS: Conflict, Farmer-herder, Food Security

JEL CODES: Q12, Q34, C36

1. INTRODUCTION

Nigeria has seen and continues to experience a widespread violent conflict of horrifying size among the nation's numerous groups, communities, religions, and political classes since its return to democratic rule in 1999. The dimensions, processes, and actors

involved in these ongoing, pervasive conflicts differ greatly. The recent rise in hostilities between crop farmers and herders in Nigeria is notable among these conflicts (Solomon, 2021). This conflict results from fighting over land being one of the most crucial human survival needs. Increased tension and violent conflict among herders, farmers, and farming communities are brought on by disputes over ownership of land resources (Okello et al., 2014). Conflicts between farmers and herders are putting at risk the chances of achieving the Sustainable Development Goals (SDGs) aims of ending world hunger and eradicating poverty (goals 1 and 2, respectively) (Apenda, 2016).

It is important to note that the growing hostility between farmers and herders has continued to take a dangerous turn, seriously threatening human survival and economic livelihood. Serious resource disputes between the two groups have occasionally resulted in the loss of life and herds, while other groups have seen a decline in the production of their crops and animals. The Federal Capital Territory (FCT) relies heavily on food supplies from neighbouring states like Nassarawa, Plateau, Benue, Kogi, Kaduna and Niger states, which are worst affected by the herder-farmer conflicts. However, most people who live in the Federal Capital Territory work in government or politics, and only a small portion of the population works in farming to supply the territory's rising food needs. The Armed Conflict Location & Event Data Project ACLED (2020) reports that 1,350 attacks associated with herder-farmer disputes have been documented in 16 states of the federation, including FCT. According to the source, Benue state led the list with 2,539 fatalities from 303 incidents. Plateau state, which recorded 2,138 fatalities in 279 attacks, Kaduna state, with 1,188 killings in 160 attacks; Taraba state, with 755 killings in 111 attacks Nassarawa state, with 521 killings in 93 attacks and Federal Capital Territory, no fewer than three persons; lost their lives in Iddo. Herder-farmer conflicts affect food production as attacks on farmers by herders have also scared many people who love to farm and produce food crops in commercial quantities to either take to the heels for their lives or resolve to small cultivation of lands at their backyards just for their consumption, therefore, there is a reduction in available farm produce and the ones available have high prices making life difficult for an average Federal Capital Territory resident. According to Ijoko, Ogakwu, and Galadima (2022), the collaborative strategy of conflict resolution is one method of bringing about peace among people because the current state of affairs presents a security issue because there is a connection between food security, national security, and human security. Collaboration between disparate groups can act as a model for how to achieve unity, peace, and progress (Shettima & Tar, 2008). There is a wealth of research on herder-farmer conflicts both in Nigeria and across the West African sub-region (Apenda, 2016; Owolabi, Oladimeji, Ojeleye & Omokore, 2016; Awotokun, Nwozor & Olanrewaju, 2020 and Solomon, 2021) that focuses on the states with the highest occurrence, while the Federal Capital Territory (FCT) is overlooked due to the rarity of attacks there thus far. As a result, it is noted that inadequate or little information has been recorded regarding the impact of the herder-farmer conflict on food security in the Federal Capital. Thus, it became essential to conduct this study to ascertain whether the herder-farmer conflicts have an impact on food security in FCT to fill the literature gap.

2.0 LITERATURE REVIEW

In two Local Government Areas (LGAs) of Kaduna state, Nigeria, Owolabi, Oladimeji, Ojeleye, and Omokore (2016) investigated the consequences of farmers-pastoralist conflicts on food security. The study made use of primary data and a carefully designed questionnaire. To analyze the data, descriptive statistics and the Logit regression model were used. According to the findings of logit regression analysis, age (-2.17), marital status (3.15), and farm size (10.91), all had an impact on conflicts. Additionally, wars significantly and favourably impacted food security. Additionally, conflicts significantly and favourably affected food security ($P < 0.05$). Based on its findings, the report advises the government to apply modern grazing techniques and pay pastoralists fairly to lessen the frequent confrontations between farmers and pastoralists.

To expand the theoretical knowledge of the connections between agro-pastoralism and farmer-herder disputes in Northwest Cameroon (NWC), Mbih (2020) uses field surveys to examine the history and political economy of farmer-herder conflicts in the region. Farmer-herder conflicts in NWC have risen and persisted despite the political ecological factors of environmental change and illogical land use policies appearing to be their main causes. This is largely due to the economic interests of Cameroonian colonial and postcolonial administrations. The study suggested protecting transhumance corridors, scheduling agro-pastoral activities to climate variability, and choosing appropriate locations for farming.

Solomon (2021) conducted a study to determine the degree to which farmer-herder conflicts affect Taraba state's food production, availability, stability, and consumption. The study used a multi-stage sampling procedure and a survey research methodology to sample 285 respondents. To evaluate the data and assess the hypotheses, p-table and percentage were employed, along with Pearson Correlation. The results of the study showed that the rising number of farmer-herder conflicts has resulted in low productivity, unstable food supplies, low food consumption, inaccessible food, and insufficient food availability in Taraba state.

In Gombe State, Nigeria, Yakubu et al. (2021) investigated the impact of farmer-herder disputes on rural households' access to food. Between 118 farmers and 112 herders, primary data were gathered utilizing a structured questionnaire and focus groups. Regression models based on percentage, Tobit, and logit were employed to analyze the data. According to the research, 59.3% of farmers and 31.3% of herders had moderate hunger and food insecurity, while 43.7% of farmers and 66.1% of herders experienced severe hunger and food insecurity. The farmer-herder conflict was caused by the killing of stray cattle, population expansion, rape, and sexual harassment, all of which had different side consequences.

Farmers-herder disputes and food insecurity: data from rural Nigeria were explored by Nnaji et al. in 2022. To estimate survey data gathered from 401 rural households in Nigeria, the study uses a two-stage predictor substitution model. According to the empirical findings, food insecurity in Nigeria is considerably worsened by farmer-herder disputes, both in frequency and severity. From the standpoint of sustainable

development, the study suggests that policy interventions be made to alleviate persistent farmer-herder disputes in afflicted nations like Nigeria.

In Nigeria, conflict-related shocks and household food security are studied by Olanrewaju and Balana (2023). The study examined and summarized the types, geographic scopes, and effects of wars on Nigeria's food security. The study also looked at how conflict-related shocks, like forced migration and fatalities, affected household food security indicators using survey data and econometric models. According to the study, the bulk of Nigeria's violent conflicts includes economic disparity, competition for productive resources, and antagonism between different ethnic and religious groups as their root causes. The primary policy recommendations are based on the findings and include the need for targeted interventions to address conflicts unique to states or regions, policy interventions on property/land rights, and livestock management systems to address herder-farmer conflicts.

3.0 METHODOLOGY

A survey research design was used in this study. Three (3) out of six (6) Area Councils of FCT Gwagwalada, Kwali, and Kuje that were chosen using simple random are included in the empirical study. The population of this study, which includes 746,100 citizens of these three Area Councils in the Federal Capital Territory (FCT), is made up of youths, men, and women above the age of 18, who are either self-sufficient or have families to support. As it is believed that all humans require food to survive, the population was randomly chosen using a simple probability random technique and the questionnaires were distributed to determine the impact of herders-farmers conflicts on food security in FCT.

Taro Yamane's formula was used to determine the sample size of 400 residents out of the population of 746,100 that are residents in Gwagwalada, Kwali and Kuje Area Councils of Abuja. The authors only sought the permission of the respondents before administering questionnaires as this study does not require ethical permission because the study relied on publicly available information.

Table 1: Distribution of Sample Size

S/No	Area Council	Population	Sample
1	Gwagwalada	346,000	140
2	Kwali	188,000	130
3	Kuje	212,100	130
		746,100	400

Source: Author's computation (2023)

Table 1 depicts the distribution of the sample size. From Table 1, the serial number column shows the number of the Area Councils. From Table 1, the Area Council column displays the names of the three (3) Area Councils. The population column gives the total population of the Area Councils who are 18 years and above. The sample column illustrates the sample size per Area Council. From the population of 746,100, a total of four hundred (400) samples were drawn for the study. The questionnaire was a four-point rating scale (Likert scale), starting from Strongly Agreed (SA), Agreed (A), Disagreed (D), and Strongly Disagreed (SD).

The data collected from respondents with the help of questionnaires for the study were analysed using Descriptive and Inferential statistics. Descriptive statistics involved the use of percentages and frequency tables; Results were presented using frequency tables and simple explanations while inferential statistics had to do with the hypotheses testing using Probit Regression Model. Probit Model was used for the analysis because the study involves multinomial response data. In the probit model, the inverse standard normal distribution of the probability is modelled as a linear combination of the predictors. The reason for using the Probit regression model is that the response variable is multinomial. Probit regression models the probability that $Y=1$ using the cumulative standard normal distribution function, $\alpha(z)$, evaluated at $z = \beta_0 + \beta_1 X_1 + \dots + \beta_4 X_4$ which forms the basis for accepting or rejecting the null hypothesis (H_0).

Model Specification

$$FS = f(AHFC, CHFC, SHFCFS, SMHFC) \text{-----} 1$$

The model was adapted from Ogebe, Abah & Ligom (2019).

Where, FS = Food security, AHFC = Awareness of Herder-farmer conflicts in FCT, CHFC = Causes of Herder-farmer conflicts in FCT, SH-FCFS = Socio-economic impact of Herder-Farmer conflicts on food security in FCT and SMH-FC = solutions to the menace of Herder-Farmer Conflicts in FCT.

The explicit function of the model can be expressed thus:

$$FS = Q_0 + Q_1 AHFC + Q_2 CHFC + Q_3 SHFCFS + Q_4 SMHFC + \mu_i \text{-----} 2$$

Where;

$\beta_0, \beta_1, \beta_2, \beta_3$ and β_4 are parameters to be estimated and they are expected to have positive values.

μ_i = Error term

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

Most of the primary data used in this study came from FCT survey data collected on the ground. Residents of the Gwagwalada, Kuje, and Kwali Area Councils in the Federal Capital Territory (FCT) were given 400 questionnaires, of which 394 were completed and returned by the respondents. The collected questionnaires were coded in Excel when the survey was finished, and the results are shown in the inferential statistics tables. Both descriptive and inferential statistics were used to analyze the data. Figures

in the form of pie charts and graphs with straightforward percentages were utilized in descriptive statistics, whereas a probit regression model was used in inferential statistics to evaluate the hypotheses.

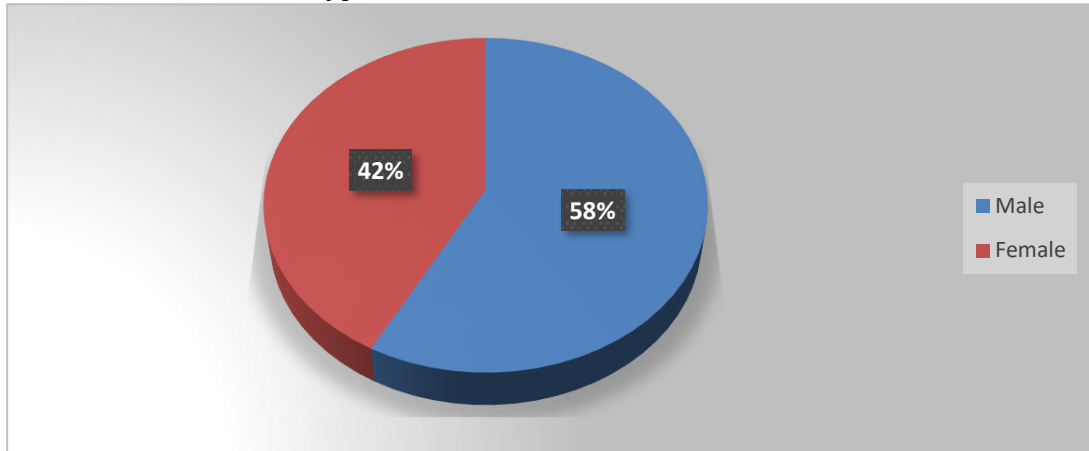


Figure 1: Sex Distribution of Respondents

Source: Author's Computation, 2023

From Figure 1, it was observed that the majority (58%) of the respondents were male while the minority (42%) of the respondents were female.

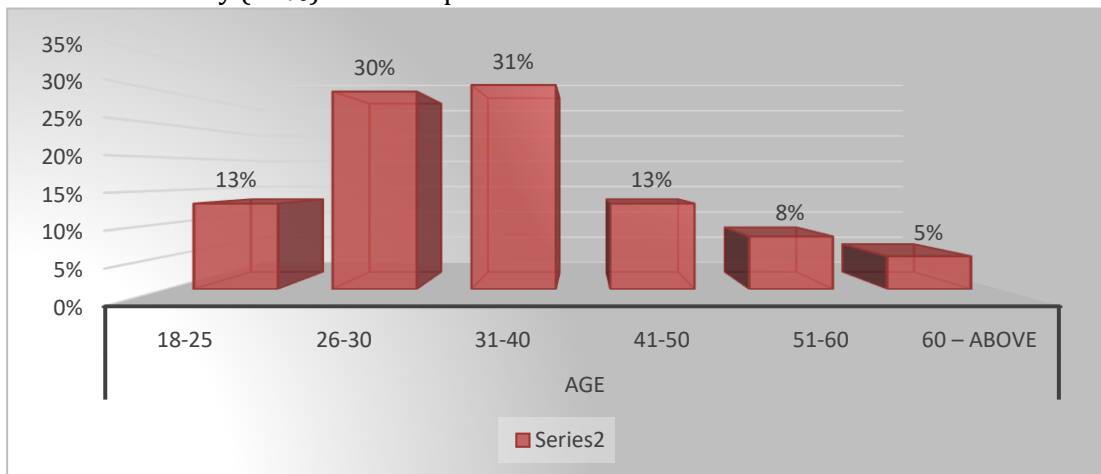


Figure 2: Age Distribution of Respondents

Source: Author's Computation, 2023

From Figure 2 the age distribution of the respondents shows that 52 respondents or 13% constitute those who are within the age bracket of 18-25 years, 120 respondents or 30% constitute those from 26-30 years, 122 respondents or 31% constitute those from 31-40 years, 50 respondent or 13% constitutes those from 41-50 years, 30 respondents or 8% constitute those within 51 – 60 years and 20 respondents or 5% constitutes those from 60 years and above. This indicates that the study cut across all age groups because everyone needs food to survive.

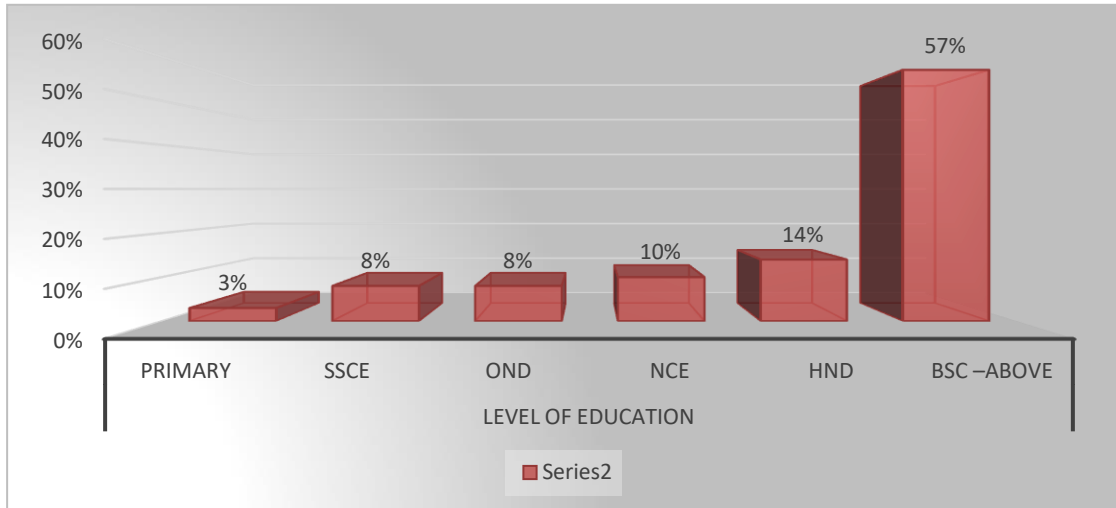


Figure 3: Educational Qualification of Respondents

Source: Author's Computation 2023

From Figure 3, the distribution of educational level indicates that 10 respondents or 3 % attended primary school level, however, 34 respondents equivalent to 8% attended secondary level, whereas 31 respondents which constitute 8% of the respondents obtained OND level, 39 respondents or 10% has NCE, 55 respondents or 14% has HND and 225 or 57% constituting the majority of the respondents has BSc and above the level of education. This indicates that the majority of the respondents with BSc and above may not be farmers but are affected by the issue of food security.

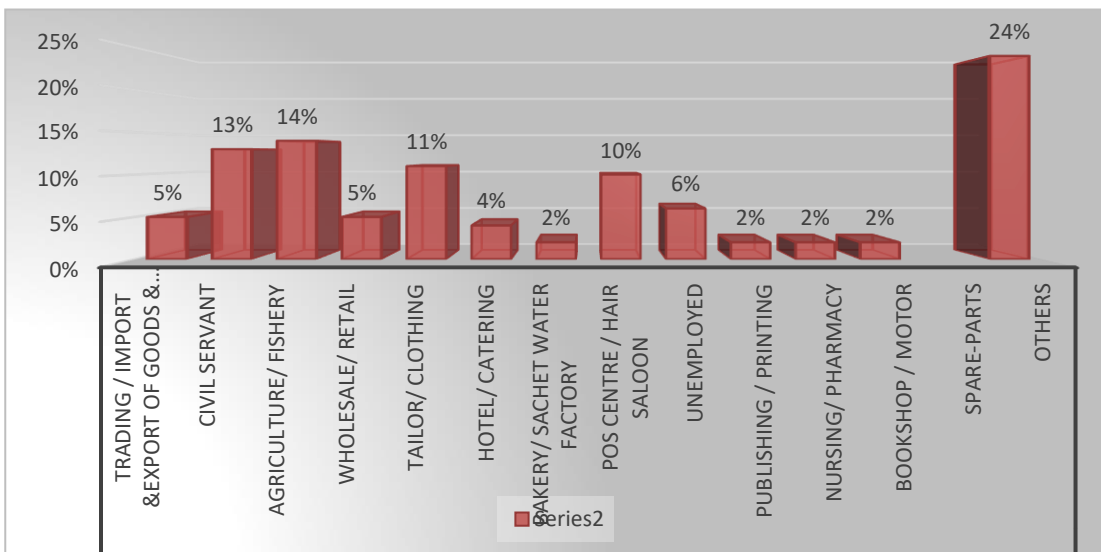


Figure 4: Occupational Distribution of Respondents

Source: Author's Computation, 2023

From Figure4, 19 respondents which represent 5% are in the business of Trading / Import & Export of goods & services, 53 respondents or 13% are Civil Servants, 56 respondents or 14% engage in Agriculture/ Fishery, 19 respondents or 5% are into Wholesale/ Retailing business, 42 which constitutes 11% are engaged in Tailoring/ Clothing, 15 respondents constituting 4% are into Hotel/ Catering, 8 respondents or 2% engage in Bakery/Sachet water factory business, 41 respondents equivalent to 10% engage in POS Centre/ Hair Salon business, the unemployed made of 24 respondents representing 6% of the respondents, 8 respondents or 2% engage in Publishing/Printing, those in Nursing/Pharmacy profession made of 8 respondents constituting 2%, 7 respondents or 2% engages in Bookshop/Motor spare business and lastly, 94 respondents or 24% is the majority are in the category of Others who chose not to mention their trade. This means that the study cut across all professions because the issue of food security is the concern of everyone in society.

Table 3: Multinomial Probit Regression Output

FS	COEF	STD. ERR.	Z	P	95% CONF. INTERVAL	
AHFC	0.0109	0.0795	0.14	0.891	-0.14480	0.1666517
CHFC	-0.2577	0.1207	-2.13	0.033	-0.49430	-0.021060
SHFCFS	-0.7501	0.1986	-3.78	0.000	-1.139346	-0.3609426
SMHFC	-0.6396	0.1889	-3.39	0.001	-1.009871	-0.2692750
CON.	2.221	0.4765	4.66	0.000	1.287717	3.155479

Number of obs = 394

Wald chi² = 75.10

Prob. > chi² = 0.000

Source: Author's computation, 2023

Table 3 shows the overall results from the Probit regression which was further split according to the objectives of the study to test the hypotheses.

Test of Hypotheses

The results of the hypothesis indicate the level of significant relationship that exists between the food security (dependent variable) and (independent variables) which enables us to make inferences on the impact of herder-farm conflicts on food security in FCT.

Hypothesis 1:

H₀: There is no significant impact of the awareness of herder-farmer conflicts among the residents on food security in FCT.

Table 4: Impact of awareness of herder-farmer conflicts among the residents of FCT on food security in FCT.

Food Security	Predictors	Coefficients	Standard error	t-value	P-value
FS	AFHC	0.0109	0.0795	0.14	0.891
	Constant	2.2216	0.4765	4.66	0.000
	Chi ²	75.1			0.000

Source: Author's computation, 2023

Table 4 shows the probit regression results of the impact of awareness of herder-farmer conflicts among the residents of FCT on food security in FCT. The result of the coefficient value of AFHC is 0.0109, and the estimated significant value is 0.891. This means a unit increase in the awareness of herder-farmer conflicts awareness leads to a 0.0109 probability increase in food security in FCT. More so, having a p-value of 0.891, in conducting the test at 1% statistical significance, awareness of the existence of herder-farmer conflicts has no significant impact on food security in FCT. Based on the above, we accepted the null hypothesis that there is no significant impact of the awareness of herder-farmer conflicts on food security in FCT.

Hypothesis 2:

H₀: There is no significant impact of the causes of the Herder-Farmer Conflicts in FCT on food security in FCT.

Table 5: impact of the causes of the Herder-Farmer conflicts on food security in FCT.

Food Security	Predictors	Coefficients	Standard Error	t-value	P-value
FS	CHFC	-0.2577	0.1207	-2.13	0.033
	Constant	2.2216	0.4765	4.66	0.000
	Chi ²	75.1			0.000

Source: Author's computation, 2023

Similarly, Table 5 shows the probit regression results of the impact of the causes of the Herder-Farmer conflicts on food security in FCT. The result of the coefficient value of CHFC is -0.2577, and the estimated significant value is 0.033. This means a unit increase in the causes of herder-farmer conflicts leads to a -0.2577 probability decrease in food security in FCT. More so, having a p-value of 0.033, in conducting the test at 5%

statistical significance, causes of herder-farmer conflicts have a significant impact on food security in FCT. Based on the above, we rejected the null hypothesis that there is no significant impact of the causes of herder-farmer conflicts on food security in FCT.

Hypothesis 3:

H₀: There is no significant relationship between the socio-economic implication of herders- Farmer Conflicts and food security in FCT.

Table 6: Socio-economic impact of Herder-Farmer conflicts on food security in FCT.

Food Security	Predictors	Coefficients	Standard Error	t-value	P-value
FS	SHFCFS	-0.7501	0.1986	-3.78	0.000
	Constant	2.2212	0.4765	4.66	0.000
	Chi ²	75.1			0.000

Source: Author's computation, 2023

From Table 6, the probit regression results indicate the Socioeconomic impact of Herder-Farmer conflicts on food security in FCT. The result of the coefficient value of SHFCFS is -0.7501, and the estimated significant value is 0.000. This means a unit increase in the socio-economic impact of herder-farmer conflicts leads to a -0.7501 probability decrease in food security in FCT. More so, having a p-value of 0.000, in conducting the test at 1% statistical significance, the socio-economic impact of herder-farmer conflicts has a significant impact on food security in FCT. Based on the above, we reject the null hypothesis that there is no significant socio-economic impact of herder-farmer conflicts on food security in FCT.

Hypothesis 4:

H₀: There is no significant impact of the solutions to the menace of Herder-Farmer Conflicts and food security in FCT.

Table 7: Impact of the solutions to the menace of Herder-Farmer Conflicts on food security in FCT.

Food Security	Predictors	Coefficients	Standard Error	t-value	P-value
FS	SMHFC	-0.6396	0.1889	-3.39	0.001
	Constant	2.2216	0.4765	4.66	0.000

	Chi ²	75.1			0.000
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Source: Author's computation, 2023

Furthermore, Table 7 displays the probit regression results of the impact of the solutions to the menace of Herder-Farmer Conflicts on food security in FCT. The result of the coefficient value of SMHFC is -0.6396, and the estimated significant value is 0.001. This means a unit increase in the solution to the menace of herder-farmer conflicts leads to a -0.6396 probability decrease in food security in FCT. More so, having a p-value of 0.001, in conducting the test at 1% statistical significance, solutions to the menace of herder-farmer conflicts have a significant negative impact on food security in FCT. Based on the above, we rejected the null hypothesis that there is no significant impact of the solutions to the menace of herder-farmer conflicts on food security in FCT.

Discussion of Results

In this subsection, findings obtained from respective statistical results, namely inferential statistics results are discussed bearing in mind the reviewed empirical findings. The study tested four (4) hypotheses. The study ascertains the impact of herder-farmer conflicts on food security in FCT for the period under review. Of the four hypotheses that were tested, the finding reveals that the impact of the causes of the Herder-Farmer conflicts on food security in FCT, the Socio-economic impact of Herder-Farmer conflicts on food security in FCT and the impact of the solutions to the menace of Herder-Farmer Conflicts on food security in FCT has negative statistical significant on food security in FCT. This finding was corroborated by the findings of Solomon (2021) where it was found that there exists a significant relationship between farmers' and herdsman conflicts, and inaccessibility to food in Taraba state.

5. Conclusion

This empirical study focuses on the impact of Herder-Farmer conflicts in FCT. Data on herder-farmer conflicts indicators were obtained through a structured questionnaire from 394 residents in three Area Councils out of the six Area Councils in FCT, namely: Gwagalada, Kuje and Kwali. Hence, to achieve this investigation's broad and specific objective, the study adopts a descriptive and inferential statistical analysis using Probit Regression Model. The impact of Herder-Farmer conflicts in FCT is evident as significant explanatory variable coefficients were statistically significant except for the residents' awareness, which was found to be insignificant. From the study's findings, the herder-farmer conflicts greatly affect food security in FCT.

Also, the empirical finding shows an insignificant positive relationship between awareness of herder-farmer conflicts and food security in FCT with a coefficient of 0.0109, and the estimated insignificant value is 0.891. A unit increase in the awareness of herder-farmer conflicts leads to a 0.0109 probability increase in food security in FCT.

Furthermore, the impact of herder-farmer conflicts in FCT exhibited a significant negative relationship with a coefficient of -0.2576 and an estimated significant value of

0.033. This result means that a unit increase in the causes of herder-farmer conflicts will result in a probability decrease in food security in FCT.

Similarly, the empirical findings reveal a significant negative relationship between the socio-economic impact of herder-farmer conflicts and food security in FCT, with a coefficient value of -0.7501 and an estimated significant value of 0.000. This result means that a unit increase in herder-farmer conflicts affects socio-economic activities in FCT, leading to a probability decrease in food security in FCT.

The empirical result further shows a negative and significant impact of the solutions to the menace of herder-farmer in FCT with a coefficient value of -0.6396 and an estimated significant value of 0.001. This result means a unit increase in the solution to the menace of herder-farmer conflicts results in a probability decrease in food security in FCT

6. Recommendations

The following suggestions are made in light of the study's findings to assist policymakers, citizens, and security personnel in addressing the threat of herder-farmer conflicts in the Federal Capital Territory (FCT) and the entire nation.

To improve food security in the FCT, the government and civil society organizations must conduct a campaign to raise public awareness of herder-farmer disputes and educate the populace about their presence in the FCT and its surroundings. To prevent confrontations that could jeopardize food security, people of the affected states, including the FCT, must also develop the positive habit of coexisting peacefully with the herders.

The designated government authorities and security personnel should conduct an in-depth investigation into the factors that contribute to herder-farmer conflicts, such as cattle theft and killing, disrespect for established customs, host community harassment of herders, unauthorized incursions onto farmland, crop destruction by herders, and territorial disputes. Food security in the Federal Capital Territory (FCT) can be ensured by designing and implementing the proper policies to address the scourge of herder-farmer disputes in Nigeria.

The designated government authorities and security personnel must conduct an in-depth investigation into the causes of herder-farmer conflicts, including cattle theft and killing, disrespect for traditional authority, intimidation of herders by host communities, unauthorized incursions onto farmland, crop destruction by herders, and land disputes. The threat of herder-farmer conflicts in Nigeria can be eliminated, and food security in the FCT can be ensured, by designing and implementing the proper policies.

In addressing the socio-economic impact of herder-farmer conflict, security personnel should protect the lives and property of those impacted by herder-farmer conflicts, and provide adequate security for farmers and those working in the agribusiness to allow for the easy transportation of farm products to market.

The anti-open grazing rule, which forbids herders from moving their livestock in public areas, should be put into practice to resolve the herder-farmer disputes. This will undoubtedly help to reduce disputes between herders and farmers, create job opportunities for the throngs of youth, and guarantee adequate food security in the FCT. In addition to addressing the threat of herder-farmer disputes, the government should construct ranches for herders throughout Nigeria's 36 states, including the Federal Capital Territory, to monitor the herders' actions.

As a last point, given their proximity to the herder-farmer conflict's victims, state governments ought to be trusted with finding a solution. Other state governments should emulate Borno State, where cattle owners are mandated to keep their animals under lock and key during the farming season to avoid crop destruction.

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Appendixes

Regression output

```
. pwcorr fs ahfc chfc shfcfs smhfc
```

	fs	ahfc	chfc	shfcfs	smhfc
fs	1.0000				
ahfc	0.3087	1.0000			
chfc	0.4735	0.1928	1.0000		
shfcfs	0.5887	0.2303	0.3697	1.0000	
smhfc	0.6016	0.2931	0.4567	0.5136	1.0000

```
. summarize fs ahfc chfc shfcfs smhfc
```

Variable	Obs	Mean	Std. Dev.	Min	Max
fs	394	1.824873	.7463503	1	5
ahfc	394	2.162437	1.382924	1	5
chfc	394	1.906091	1.040558	1	5
shfcfs	394	1.84264	.695759	1	5
smhfc	394	1.890863	.7280409	1	5