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Post Farmer-herder Conflict Management and Relief Strategies of Farmers in Nigeria

L.K. Olatinwo[1], S.E. Komolafe[1*] and K.O. Faronbi[1]

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ABSTRACT

Purpose: *This study shed light on the self-relief strategy employed by farmers after their experience in farmer-herder conflict.*

Research Method: *The survey was carried out among 150 farm households headed in four farming communities. Frequency and logistic regression statistics were employed to analyze data.*

Findings: *Findings showed that farmer-herder conflict resulted in the destruction of farm crops and insufficient food for household consumption among affected rural households. Affected rural households decided to adopt coping strategies that reduce their vulnerability by tightening farm security, preventing future huge farm loss by sowing less, and completely avoiding of risk of conflict effects with no intention to continue crop farming by borrowing money and shifting to off-farm jobs. Education/literacy of the people and causes of conflict were found to be the behavioral control factors of the farmers.*

Practical Implication: *The study provided recommendations for rural development advisors and policymakers to inform post-conflict management and relief strategies for effective coping and adaptation responses to farmer-herders conflict victims in Africa and other developing countries experiencing similar nature of conflict.*

Originality/ Value: *The study is novel for reporting, for the first time, the post-farmer-herder conflict behavior of farmers in Nigeria.*

Keywords: *Crop loss, Farm security, Farmer-herder conflict, Food insecurity, Off-farm job.*

INTRODUCTION

Globally, conflict has been accepted as an integral part of the social interaction of any society as well as human existence. However, the conflict has often been the drive against sustainable development and the peaceful co-existence of several culturally different societies in developing nations of the world (Adebajo *et al.*, 2021).

In Africa, farmer-herders violent conflicts have severely affected rural communities and farming households the more. The herdsmen's extremists are often in possession of illegal arms, as crop farmers become the vulnerable group with a high tendency for negative effects on their livelihoods (George *et al.*, 2020).

For centuries, farmers in rural communities and herders who grazed their animals across the region of Sahelian Africa have enjoyed peaceful co-existence, a symbiotic relationship and economic cooperation, with both sharing rural land and other related resources (Ahmed and Muhammad, 2021). Violence linked to farmer-herder conflicts has spiked high and triggered huge damage in West and Central African countries, including injuries, human fatalities, and displacement of large rural populations (Tanyi *et al.*, 2021).

[1]Department of Agricultural Economics and Extension Services, Kwara State University, P.M.B. 1530 Ilorin, 23431 Malete, Kwara State, Nigeria

*kemmas04@yahoo.com

https://orcid.org/0000-0002-2293-1506

In 2019 alone, there were 10,460 fatalities from 3,471 reported violent events in the sub-Sahara Africa region, which also uprooted almost one million people, especially in Ethiopia (Beyene, 2017), Botswana (Kalabamu, 2021), Cameroon (Feldt *et al.*, 2020), Cote d-Ivoire (Cabot, 2017), Burkina Faso and Mali (Olumba *et al.*, 2022), Ghana (Issifu *et al.*, 2022) and Nigeria (George *et al.*, 2021; Komolafe *et al.*, 2022). Not only in Africa but also in South Asia countries that homed extremely large diversity of pastoral communities where the pastoralists' contend for limited natural resources (Singh and Kerven, 2023; Ahmad, 2023; Ashraf *et al.*, 2022).

However, in recent years, studies have shown that climate change effects and other environmental factors (Nnaji *et al.*, 2022; Lenshie *et al.*, 2020), grazing constraints on herdsmen (Eke, 2020), displacement by Boko Haram attacks (George *et al.*, 2021), rapid population growth (Day and Caus 2020) led nomadic herders to graze their cattle farther away from their usual grazing areas were factors that amplified competition on limited land resources and control over land claim with rural farmers, resulting in fights and disagreements between settled farming communities and mobile herders (George *et al.*, 2021). Other studies have attributed the incessant herders-farmers conflicts to high rate of youth unemployment, encroachment into herders' grazing routes and reserves for cattle, false news and media publicity, free exit and entry of the nation's borders, scarcity of water for cattle, rustling of cattle and banditry in rural communities, indiscriminate bush burning, lack of security, cattle damaging farm crop, lack of knowledge about grazing routes and laws (Bello and Abdulahi, 2021).

Conflicts and war have been proven to have significant negative influence on human economic and social development (Hamoodi, 2021). Consequences farmer-herder conflicts on agriculture have been reported to include loss of farm productivity (Amao *et al.*, 2018), food insecurity, hunger and loss of lives (Tanyi *et al.*, 2021), destruction of rural infrastructure (Effiong and Owolabi, 2022), displacement of crop farmers from their inherited farmlands (Yikwab and Tade, 2021) and low farm outputs (George *et al.*, 2021).

The incessant occurrence of conflict between crop farmers and herders has become one of Nigeria's popular and difficult-to-address security challenges (Awotokun *et al.*, 2020). Studies across countries have shown that affected persons, potential victims in case of re-occurrence, or people living in conflict environments develop some behavioral coping strategies to mitigate its effects after the incidence. Yet, there is lack of study describing the behavior of farmers after their experience of violent conflict in literature. Similar studies by Ajayi *et al.*, (2019) focused on farmers' strategies to maintain peaceful co-existence with herdsmen while Yikwab and Tade (2021) concentrated on coping strategies of farming communities to displacement effect of farmer-herder conflict in north-central Nigeria. The present study was carried out in the southern part of Nigeria where the influx of the nomadic herdsmen is currently having a heavy toll on the crop farmers. Oyo State is one of the South-West states with persistent conflicts between farmers and herdsmen. Olagbemiro *et al.* (2022) noted that the majority of farmers in rural communities in Oyo State have experienced at least one form of crime victimization on their farms and properties. Recently in the early months of the year 2021, there was a report of increased insecurity in rural communities of Oyo State due to the massive destruction of farmers' crops by cattle, kidnapping and murdering alleged to be orchestrated by herdsmen (Ogungbenro *et al.*, 2022). It has further been argued that the presence of settled and migrant herders from the Niger Republic (Bororos) who migrate unlawfully into Nigeria through the Benin Republic border in the Oyo state Northern side has escalated the conflicts (Ogungbenro *et al.*, 2022).

The study aims to investigate the post-conflicts relief strategies of rural households to mitigate the effects of the farmers-herders crisis in Oyo State, Nigeria. The specific objectives are to (i) describe the socio-economic characteristics of respondents, (ii) examine the farmers' perceived causes of farmers-herders' conflicts, (iii) identify the post-farmer-herder's conflict effects on farmers, and (iv) examine the relief strategies employed by farmers to mitigate post-conflicts effects.

MATERIALS AND METHODS

This study was conducted in Oyo State, Nigeria. Oyo is an inland state in Southwestern Nigeria which has its capital at Ibadan. It is located between Latitude 7021 and 90 11 North of the Equator and between Longitude 20 51 and 40 31 East of the Greenwich Meridian. In all the months of the year, the state records daily temperatures ranging from an average of 25 °C (77.0 °F) to 35 °C (95.0 °F). Oyo state has thirty-three Local Government Areas (LGAs). The LGAs experiencing persistent farmer pastoralist conflict were Itesiwaju, Irepo, Iwajowa, Saki East, Iseyin, Kajola, Olorunsogo, Orelope, Saki West and Atisbo (Ogungbenro *et al.*, 2022).

The target population for the study includes all rural dwellers in Oyo State. A stage sampling procedure

was applied to select respondents. A simple random selection of 2 LGAs with prominent pastoralists and conflict reports (Ido and Oluyole LGAs of Oyo State) were first selected. A simple random selection of two farming communities in each LGA was performed in the second stage. The selected communities were Ido LGA – Omi Adio and Akufo; Oluyole LGA – Idi Ayunre and Sanyo. In the third stage, 35 rural households were chosen from each of the communities to give a total sample size of 140 respondents. A semi-structured questionnaire was used as an instrument to collect quantitative data through a field survey.

Data gathered were analyzed with both descriptive and inferential statistics. Results of the specific objectives were presented in frequency tables, percentages, mean, and standard deviation while binary logistic regression was used to determine factors that influence farmers' decision to take relief strategy after conflict experience. The model is expressed as:

$$\ln\left(\frac{\rho - i}{1 - \rho_i}\right) = X_t + \varepsilon \qquad (1)$$

Where X_t is the index reflecting the combined effect of independent X variables that prevent or promote the decision to uptake a relief strategy. The dependent variable is the natural log of the probability of using post-conflict relief strategies (P) divided by the probability of not using post-conflict relief strategies ($1 - P$). b is the slope, and ε is the error term. The index level can be specified as:

$$X_t = \beta_0 + \beta_1 X_1 + \cdots + \beta_n X_n + \varepsilon \qquad (2)$$

Where:$X_1, \ldots, X_n$ are the independent variables,β_0 is the intercept,β_i is the slope associated with the ith independent variable, and ε is the error term. X_1: Sex (male = 1, otherwise = 0),X_2: Age (years),X_3: Educational qualification (formal education = 1, otherwise = 0),X_4: Experience in farming (years),X_5: Religion (dummy: Islam/Christianity = 1, otherwise = 0), X_6: Household size (number of persons),X_7: Farm size (hectares),X_8: Causes of conflict (dummy: cause = 1, otherwise = 0),X_9: Post-conflict challenges (dummy: challenge = 1, otherwise = 0).

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Data presented in Table 01 shows that 54.0% of the respondents were female while 46.0% were male. The mean age of the respondents was 39.8±8.15 years. The majority (78.7%) were married. A significant percentage (44.7%) of the respondents had adult education. Also, respondents had an average of 7.8±2.15 years of crop farming experience, 4.7±1.25 persons in their household, and 3.0±1.29 hectares of land size cultivated for crop farming.

By implication, both males and females were involved in crop production in Oyo State. In this case, women may likely be the highest victim of crop farmers' conflict with herders and face more consequences. The finding further indicated that crop farmers in Oyo State are relatively young, implying their potential capability to perform crop farming tasks. Unfortunately, the majority had no formal education to adult education. This factor may negatively influence crop farmers' decision in the study area to adopt innovation strategies to mitigate the occurrence of conflict with Fulani herders. Having an average of 4 persons in a household indicated the availability of family labor for crop farming activities, but for security reasons, many may not engage family members in performing crop farming activities due to reports of frequent and unexpected attacks by herders on crop farmers in Nigeria.

Farmers' Perceived Causes of Farmers-herders Conflicts

Results presented in Table 02 show that all (100%) of the respondents indicated that destruction of farm crops, contamination of streams by cattle, cattle rustling, loss of grassing land, and encroachment of cattle grassing route by crop farmers were the causes of farmers-herders in Oyo State. The majority further indicated some causes including sexual harassment of women by herders (65.3%), stray cattle (96.0%), and harassment of herders by host community members (72.0%). By implication, the loss of grassing land mainly caused by the menace caused by change in climate and encroachment of cattle grassing routes by crop farmers is expected to cause a shortage of grassing land which may result in herders opting for alternative grassing fields including crop farms. This finding necessitates for appropriate agricultural extension policy and intervention program for the establishment of artificial grassland intensification. Reorientation program among crop farmers on the importance cattle grassing route for social peace and the need for zero cultivation of crop along the cattle grassing route will also help to reduce farmers-herders conflicts in Oyo State.

Findings of this study confirm report by previous studies (Ajayi *et al.*, 2019) that cattle invasion into crop farm was one of the main reasons for farmer-herder

Table 1: Socio-economic characteristics of respondents.

Variables	Categories	Frequency	Percentage (%)
Sex	Female	81	54.0
	Male	68	46.0
Age	Mean	39.8 ± 8.15	
Marital Status	Married	118	78.7
	Divorced	11	7.3
	Widowed	21	14.0
Educational Status	Tertiary education	24	16.0
	Secondary education	6	4.0
	Primary education	12	8.0
	Adult education	67	44.7
	No formal education	41	27.3
Years of Experience	Mean	7.8 ± 2.15	
Household Size (persons)	Mean	4.7 ± 1.25	
Farm size (hectares)	Mean	3.00 ± 1.29	

Source: Field survey, 2022.

Table 2: Causes of conflict involving farmers.

Causes	Frequency	Percentage (%)
Destruction of crop	150	100.0
Theft of cattle	150	100.0
Pollution of river/stream water by cattle	150	100.0
Lack of respect for traditional authority of host community	29	19.3
Encroachment of cattle grazing route by crop farmers	150	100.0
Sexual harassment of women by herders	98	65.3
Stray cattle	144	96.0
Bush burning	20	13.3
Zero grazing on fallow land	30	20.0
Harassment of herders by host community members	108	72.0
Loss of grazing land	150	100.0
Indiscriminate defecation	14	9.3
Improper management of cattle by herders	70	46.7

Source: Field survey, 2022.

Table 3: Effects and challenges faced by farmers after conflict.

Effects	Frequency	Percentage (%)
Loss of life	62	41.3
Loss of income	150	100.0
Insufficient food	150	100.0
No mutual trust	102	68.0
Migration	66	44.0
Displacement	106	70.7
Increase in the number of widows/orphans	62	41.3
Outbreak of hunger/diseases	127	84.7

Source: Field survey, 2022.

crises in Oyo State. Also, reports have indicated sexual harassment of herders' women and cattle rustling as

Table 4: Coping strategies to effects of conflict.

Coping Strategies	Often used (%)	Rarely used (%)	Not used (%)	Mean±SD
Working harder	79 (52.7)	28 (18.7)	43 (28.7)	2.24±0.872
Borrowing money	51 (34.0)	87 (58.0)	12 (8.0)	2.26±0.596
Sowing less	48 (32.0)	100 (66.7)	2 (1.3)	2.31±0.491
Selling farm	22 (14.7)	122 (81.3)	6 (4.0)	2.11±0.420
Prepare for worst	21 (14.0)	129 (86.0)	0	2.14±0.348
Shift to another job	51 (34.0)	87 (58.0)	12 (8.0)	2.26±0.596
Using charm	5 (3.3)	89 (59.3)	56 (37.3)	1.66±0.541
Tightening farm security	137 (91.3)	13 (8.7)	0	2.91±0.282

Source: Field survey, 2022.

factors that triggers conflicts between Fulani herdsmen and their host communities in Oyo State (Okunlola 2016; Bello and Abdulahi. 2021).

Effects and Challenges Faced by Farmers After Conflict

Consequences of farmer-herder conflicts according to the respondents include insufficient food (100%), outbreak of hunger/diseases (84.7%), displacement (70.7%), and loss of mutual trust between farmers and herders (68.0%). Details of the results are presented in Table 03. The understanding from the findings in Table 03 is that insufficient food was the leading effect of the farmer-herder conflicts. This is expected, since as destruction of crop fields earlier reported by all respondents, as one of the causes of conflict will reduce crop yield, size and harvest by farmers, which will directly translate to shortage of food supply and poor household food consumption pattern. The implications are food insecurity, outbreak of hunger and diseases resulting from insufficient balance diet intake among farming households and the society at large. This finding agrees with a study in other country indicating that conflicts negatively affects agriculture and food security (Brück *et al.*, 2019). The situation of severe food insecurity among farmers can further become an influencing factor to prolong conflict, generating another circle of food insecurity and conflicts (Martin-Shields and Stojetz, 2019).

Due to lack of trust and the fear of loss of life and properties, leaving family members as widow and orphans which had been reported by significant percentage of the respondents, many farmers have been displaced. A displaced crop farmer may not live their normal life again in farming business. They are prone to faced challenges such as lack of adequate land for farming or may loss total interest in farming and chose alternative job. This situation will reduce the number of farmers producing food and then food insecurity emerged in the society. This is in line with Ajayi et al. (2019), who noted that rampant conflict between crop farmers and herdsmen has negatively affected food security and sustainable livelihood of farmers in Nigeria. Finding also agree with Adebo and Olotu (2018) who earlier reported abandonment of farm job and poor as a consequence of incessant conflict between farmers and Fulani nomads in Nigeria.

Farmers' Relief Strategies to Post-conflict Effects

Crop farmers have reported several ways to cope with the situation of farmers-herders conflicts in Oyo State. As presented in Table 04, tightening farm security (mean=2.91), sowing less (mean=2.31), borrowing money and shift to another job (mean=2.26) were the leading strategies to cope with the hazards caused by farmers-herders conflicts among crop farmers and pastoralists in Oyo State.

It has been shown again in Table 04 that farmer-herder conflicts are really anti-food security in Nigeria. The ways in which majority of the farmers cope with the menace such as sowing less, borrowing money and shift to another job will definitely result to food shortage and increase in food price.

Factors Influencing the Choice of Post-conflict Relief Strategies Employed by Farmers

According to the result presented in Table 05, it was shown that some factors significantly affect the decision of coping strategies applied by crop farmers in Oyo State (model chi-square = 25.939, p < 0.05) with 83.3% overall case correct prediction. Specifically, it was found that only education in years of schooling ($\beta = 2.048, p < 0.01$), causes of conflicts ($\beta = 1.923, p < 0.05$), and post-conflict effects ($\beta = 1.457, p < 0.01$) had a significant influence on the decision of post-conflict relief strategies employed by crop farmers in Oyo State.

Table 5: Factors influencing the choice of post-conflict relief strategies employed by farmers.

Post-Conflict Relief Strategies	Parameter estimates (β)	Std. Error	Wald statistics	*p*-value	Odds ratio Exp(β)
Sex	0.047	0.042	1.296	0.255	1.048
Age (years)	1.11	0.909	1.492	0.222	3.034
Marital Status	-0.013	0.113	0.013	0.910	0.987
Years of schooling	2.048*	0.552	13.766	0.000	7.751
Years of farming experience	0.295	0.725	0.166	0.684	1.344
Religion	-0.154	0.08	3.703	0.054	0.857
Household size (persons)	-0.022	0.143	0.023	0.879	0.978
Farm size (hectares)	-1.120	1.072	1.092	0.296	0.326
Cause of conflicts	1.923*	0.806	5.688	0.017	6.844
Post-conflicts effects	1.457*	0.559	6.798	0.009	4.295
(Constant)	2.381	1.763	1.824	0.770	0.092
Model chi-square			25.939	0.002	
Overall case correctly predicted			83.3%		
Sample size			150		

By implication, education, causes of conflicts, and conflict-induced challenges could contribute positively to the choice of post-conflict relief strategies employed by crop farmers in Oyo State. Thus, the increase in 1 year of schooling predicted the farmers' possibility to choose a relief strategy after farmers-herders conflict by 2.048 units. In the case of causes of conflict, a cause of farmer-herder conflict predicted farmers' possibility to choose a relief strategy after the conflict by 1.923 units. Additionally, a challenge induced by farmer-herder conflict will lead to 1.457 units of choice of relief strategy. This is wisdom on the path of the crop farmers as they employ coping strategies that best answer the cause of the conflict. This shows that no one-way answer for coping strategies to employ but are determined by the causes. This finding is affirmed report by Yekinni *et al.*. (2017) who found that adaptation strategies of farmers during the conflict were significant association forms of education of farmers.

CONCLUSION

It can be inferred that rural households in Oysmall-scale small-scale farmers. The leading causes of farmer-herder conflicts in Oyo state are the destruction of crops, pollution of rivers by cattle, cattle rustling, loss of grassing land, encroachment of cattle grassing route by crop farmers, sexual harassment of women by herders, stray cattle, and harassment of herders by host community members. The topmost post-consequences effects of farmers-herders conflicts in Oyo state are insufficient food, an outbreak of hunger/diseases, displacement, and loss of mutual trust between farmers and herders.

The foremost choice of coping strategies by rural households in Oyo after farmers-harders conflicts are tightening farm security, sowing less, borrowing money and shifting to another job. The decision for choice of strategies to adopt by rural households is strongly determined by their years of schooling (educational level) and causes of the conflict. The study reveals the role played by farmer-herder conflict in crop destruction, and food insecurity; and outlines the behavior of the farmers after conflicts through the choice of coping strategies they adopted. The findings revealed in this study can be useful for academics and researchers to characterize post-conflict-situation and possible behavior of farm families in Africa and other developing countries experiencing similar conflict. The outcome of the post-conflict challenges is particularly importance to formulate appropriate policy and planning intervention programs aimed at relieving farm families of this conflict in African countries.

Moreover, this study offers a framework and recommends other researchers to investigate post-conflict effects and coping strategies among Fulani herdsmen. Such findings will provide a balance of information on strategies employed by farmers and Fulani herdsmen who often engaged in conflict. Finally, the results of this study can be useful to extension practitioners, community/opinion leaders, and government representatives to explore future professional roles in conflict resolution strategies. The following recommendations are made from the findings: On the destruction of crops by cattle causing farmer-herder conflicts, this study suggests that concerned national agricultural research institutes

should develop a cattle-repellant technology that could be applied by crop farmers in Kwara state. Farmers too should double their efforts in tightening the security of their crop fields by employing the service of private or government security personnel. Crop farmers in a particular community can cultivate their farms. This will help to monitor cattle invasion into crop fields and unnecessary conflict with herders.

Loss of grassing land mainly caused by climate change and encroachment of cattle grassing routes by crop farmers is expected to cause a shortage of grassing land, which may result in herders opting for alternative grassing fields including crop farms. This study therefore suggests an appropriate agricultural extension policy and intervention program for the establishment of artificial grassland intensification purposely for cattle. A reorientation program among crop farmers on the importance cattle grassing route for social peace and the need for zero cultivation of crops along the cattle-grassing route will also help to reduce farmers-herders conflicts in African countries where these conflicts occur.

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