

## Assessment of Economic Effects of Cattle Breeders' Activities on Crop Farmers in Kogi State, Nigeria

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**Abstract:** Conflict amongst crop farmers and herdsmen in Kogi State, Nigeria has taken a new dimension due to what can be termed “scramble for the land” hence resource use conflict. The competition between these two agricultural land user-groups, however, has often times turned into serious concealed and unconcealed manifestation of hostilities and social friction in many parts of Kogi State and has remained a major challenge facing agricultural production. It has to a great extent affected the necessity to provide food of crops and animal origin, as well as raw materials for industry and export in order to meet ever-growing demands. This study assessed the economic effects of cattle raisers activities on crop farmers in Kogi State. A multi-stage purposive and random sampling techniques were used to select 160 crop farmers. Data were collected from primary source with structured questionnaire and analysed using descriptive and inferential statistical tools. The result of the study showed 11 possible causes of farmer-herder conflict as perceived by the farmers with destruction of crops as the major cause. The study also showed that 85% of the respondents lost over 80% of their crops. The Regression result on the effect of conflict on farmers farm income showed a negative statistically significant relationship. The major coping strategy employed by the crop farmers to reduce the effect of farmer-herder conflict was compensation from SEMA. The study therefore recommends that government should make policies that allows cattle rearing on intensive or semi-intensive system of grazing and greater fodder production to feed the cattle especially in times of scarcity and during the dry season; the government should institute at community level a community security system with emphasis on training people on conflict prevention, resolution and management; amongst others.

**Key words:** Herdsmen • Crop Farmers • Conflict • Kogi State • Nigeria

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### INTRODUCTION

The Agricultural sector has always been an important component of Nigerian economy with over 70% of the population engaged in agriculture and agriculture related activities [1]. Crop and livestock agriculture is important in the life of most Nigerians as 50% to 80% of Nigerians are involved in crop, livestock or both crop and livestock agriculture and dominated by the small scale farmers who represent a substantial proportion of the total population and produce about 90-95% of the total agricultural output in the country [2].

The cattle raisers, predominantly Fulanis falls into the livestock based system, they indisputably represent a significant component of the Nigerian economy. They constitute the major breeders of cattle, the main source of meat, the most available and cheap source of animal proteins consumed by Nigerians. They own over 90% of the nation's livestock population which accounts for one-third of agricultural GDP and 3.2% of the nation's GDP [3]. Furthermore, the contribution of the Fulani to the local food chain and national food security cannot be overstressed. The Fulani, with their dominance in the Sahel region, are the best known

and most numerous of all the pastoral groups in Nigeria. The traditional and unique Fulani encampment (*ruga*) consisting of temporary structures made of stalks, closely knit family members and livestock is the natural habitat of the orthodox Fulani settlement [4].

These Fulani tribesmen were originally found in small communities scattered across the northern fringes of Nigeria and other countries in West Africa. They care less about land ownership because they are always on the move. By their culture, tradition and occupation, they have remained an itinerant race who neither owned lands nor had any permanent abode [5]. They simply live with their cattle wherever there is abundance of fodder and absence of tse-tse-fly, (the blood sucking insect that threatens the existence of their flocks). The Fulanis are known to embark on seasonal migrations from the North to the South but this movement has become along all seasons affair due to factors like desertification and climate change [6]. Initially, a symbiotic relationship existed between the herdsmen and the farmers. In every new community they stopped over to take a rest, the host communities usually farmers, derived organic manure from cow dungs and protein from the beef and dairy products while the herdsmen relied on the farm produce for food. However, this ancient practice and many generation of coexistence have been threatened by many factors such as; population growth, advancement in technology and climate change, environmental degradation, desertification/desert encroachment, loss of wetlands, inadequacy of rainfall (droughts) and extreme climate variability and volatility; these conditions interface to produce the dynamics of ecological misfortunes with far-reaching implications for the agrarian communities [7-11].

An important challenge facing agriculture and rural development in Nigeria is the problem associated with farmer-herders conflicts. The activities of the Fulanis have led to serious farmers/herders conflict. Apart from the language and cultural barriers which usually spots out the nomads as strangers, the audacity with which they shepherd their flocks to graze on available vegetation on their route has often attracted protests from communities [12]. Some of the causes of the conflict as observed by Ajuwon [13] is that most times the Fulani herdsmen wander into the fields during growing season while their herds eat or trample on the crops due to the herdsmen's lack of attention or the cattle's stray movement, hence tension rises. According to Tenuche and Olarenwaju [14],

over the last decade, clashes between farmers and Fulanis have increased in several parts of central Nigeria which have given rise to an unhealthy rivalry between farmers and herdsmen leading to violence, loss of lives and property. In some cases, a whole community was wiped out and those fortunate to escape have become refugees in other places. These clashes have occurred several times in Plateau, Benue, Nassarawa, Kogi, Kwara, Edo, Delta, Enugu, Abia, Ebonyi, Ondo, Oyo, Osun and many other states. Conflict in resource use is not uncommon and perhaps not unnatural in human ecosystems. Olabode and Ajibade [15] noted that conflict per se, is not bad: it is perhaps a necessity in the evolution and development of human organizations. But when conflicts degenerate to violent, destructive clashes, they become not only unhealthy but also counter-productive and progress-threatening [16, 17], pointed out that resource-related conflicts are responsible for over 12% declines in per capita food production in sub-Saharan Africa.

Kogi State has witnessed several infiltrations of herdsmen due to the conducive weather condition, absence of Tse-tse fly in most part of the state and its relatively long period of rainfall for most of the year, making the state attractive to the Fulanis leading to serious farmers-herders conflict. In some cases, due to the seriousness of farmer-herders conflicts, herdsmen were prevented from entry or forced out of some areas in the State. For instance, in 2007 they were driven out of Bassa Local Government Area after serious encounter with farmers [18]. A host of factors, most often, engineers these conflicts. This situation has been made worse by the claims and contestations over land ownership and/or tenure rights. Hence, as farmers take up more of the river-bank for farms, they come into conflict with the other users, especially the herders and fish-folk. The herders have been coming to the river for many years for the grass and tend to consider they have ownership rights. When they arrive and find their graze land now covered by tomatoes, they may become angry. The farmers, often desperate to feed their families in a situation where the old rain-fed systems no longer work regard the herders as dangerous and intrusive [19]. Altercations that follow usually end up in violence, with loss of lives and properties by both sides. This arguably explains the perennial pastoralist/farmer debacle in Kogi State [20]. Agricultural sector in Nigeria, particularly in Kogi State, has not been doing so well. Output has failed to keep pace with the rising population pressure.

Farm households have often been classified as the most poor in the society, with the level of their poverty increasing. From 1996 to 2002, forty nine cases of farmer Fulani conflict were reported. Crops estimated at over 1 million naira were reportedly damaged [21]. This discouraged the farmers and rural agricultural development, increasing frustration and impoverishment of farmers occasioned by perennial and extensive farm plot destruction and the ensuing bitter conflicts eroding the gains of agricultural and rural development interventions. Could the farmers-herders conflict be a contributing factor to this? This study investigated the major causes of farmer-herder conflict in Kogi State, the extent of agriculture losses due to the conflict and the effect of the conflict on the farmer's farm income, the coping strategies adopted by the farmers to combat this conflict and towards tackling the menace.

Previous studies such as Beltran [22] on "The Effects of Migration by Nomadic Farmers in the Livelihoods of Rural Crop Farmers"; Butera and Marcel [23] on "Resource conflict among farmers and Fulani herdsman, implications for resource sustainability in Kogi State"; Moritz [24] on "Environmental Induced Conflict and Sustainable Development a Case of Fulani-Farmers' Conflict in Oke-Ero LGA, Kwara State", Homer-dixon [25] on "Conflict Management Strategies to Reduce consequences on Livelihoods of Fulani Cattle Herders and Farmers in Kabba-Bunu, Kogi State", did not address the economic effects of cattle raiser's activities on farm households in Kogi State. Hence, the existence of the knowledge gap which this study hope to fill.

**Objectives of the Study:** The broad objective of this study is to assess the economic effect of cattle raiser's activities on crop farmers, while specifically, the study seek to;

- describe the socio-economic characteristics of farmers, in Kogi State;
- identify and describe the major causes of the conflict between herdsman and crop farmers in Kogi State;
- describe the extent of agricultural losses by crop farmers due to the conflict;
- determine the effect of conflict on the crop farmers farm income;
- describe the coping strategies adopted by the crop farmers to cushion the effect of the conflict; and
- describe the major institutional and government strategies towards resolving the conflict from the farmers perspective, in Kogi State.

**Hypothesis:**  $H_{01}$ : Conflict between cattle headers and crop farmers does not have significant effect on their farm income.

**Empirical Review:** Hartmann [26] examined the conflict between Guma farmers in Benue state and herdsman. They purposively selected 160 heads of family households and 140 herdsman from areas that have experienced farmer-herders conflict. The study revealed that there is a consensus among farmers and herders that herdsman were unacceptable to their host communities. The study further disclosed that the major causes of conflict between herdsman and farmers were the role of the traditional rulers, crops/farmland destruction, water contamination and harassment of herders by the host communities. Findings included displacement of both farmers and herdsman, loss of lives and properties and decrease in farmers output as the major effects of the conflict. The study recommended that grazing reserves should be created for herders to shift from the outdated method of animal husbandry to modern ranching method.

Similarly, National Population Commission [27] carried out a study on the impacts of conflict on farm resource productivity in Akwa-Ibom state of Nigeria. A multi-stage sampling technique was used for data collection wherein 114 farmers were sampled. Findings reveal that land area, quantity of fertilizer, planting materials and community location to a large extent determines farm outputs. This implies that the conflict status of a community markedly impact on its agricultural outputs. The communities in the study area were found to be efficient in family labour as their major factor of production.

Ofuoku and Isife [28], examined the regular resource-based conflicts between farmers and herdsman and their impacts on agricultural extension service delivery in Nigeria. The study precisely focused on the perceptions of conflict and the coping strategies among the farmers and the herders with a view to identifying a role for extension management of conflict between farmers and herders. Instrument for data collection were a combination of structured questionnaire and multi-stage cluster random sampling technique with which 300 farmers and 60 herders were selected for the study. The study revealed that majority of farmers (78%) perceives the conflict as a "loss" while 68% of herders see it as a "threat". Equally, 75% of farmers used "problem oriented" coping strategy as against 73% of herders who used "emotion-oriented

coping strategies". 62% and 7% of farmers and herdsmen, respectively, alternatively used "social support" as coping strategies. The Pearson correlation showed that annual income ( $r=0.773$ ,  $P=0.001$ ), farm size ( $r=0.82$ ,  $P=0.002$ ), non-farm income ( $r=-0.71$ ,  $P=0.003$ ) and household size ( $r=0.651$ ,  $P=0.004$ ) correlated with the loss perception among farmers; while among herdsmen, the significant correlates of threats perception were age ( $r=0.611$ ,  $P=0.033$ ) and herd size ( $r=0.814$ ,  $P=0.002$ ). It is noteworthy that only 4% of the total respondents perceived the conflict as opportunity to gain". The position of the study is that conflicts between crop farmers and cattle herders in Nigeria should not be inflexible as they appear currently and that a three-tiered committee on management of farmer-herder conflict in Nigeria be set up. The study further recommended that in order to ameliorate the social and psychological effects of conflicts in the area there should be established functional role for extension services which should be subject to periodic review, increased awareness and compliance with stock routes; in addition to training of extension workers and all stakeholders on appropriate coping mechanism.

**Theoretical Foundation:** The study is premised on the inter-group conflict theory propounded by Faia and Silva [29]. According to the author, "an incompatibility of goal, belief, attitudes or behaviour" occasionally result to conflicts of various magnitude and dimension. These include, power, economic and value differences. Economic conflicts arise from competition for resources which are often scarce, while power conflict emanates from circumstances where groups fight for dominance over one another. On the other hand, value conflict connotes disagreements between the belief/lifestyles of different groups. Invariably, conflict has various components which includes divergences in task values, attitudes and goals as groups strive to appropriate the obvious scarce resources for their respective advantages.

Similarly, Ajuwon [21] posit that conflict derive from complex sequence of occasion involving cultural and political factors while structural theory tend to emphasize the immediate and underlying factors responsible for occurrences and escalation of conflict situations.

According to Olabode and Ajibade [15], conflicts between crop farmers and herdsmen in Nigeria can be explained on the structural perspective involving factors commonly shared by herdsmen and the host communities.

The author contends that the major approaches to the study of crop farmers-cattle herders conflicts in the black continent is basically structural: environmental security and political ecology. Scholars of the environment security such as Moore [10] emphasize that the implications of scarcity of resources and the ever increasing scramble for appropriation of these resources in short supply constitute the primary causes of conflict though not the only reason for more frequent conflicts over the resources of nature. Homer-Dixon's position has been challenged by political ecology scholars such as Salau [2], Eniola [3] who argues that many factors that contribute to conflict in Africa are not environmental, natural resources and rural development but "political, religious, ethnic, economic, land tenure system and historical feuds"

Conversely, in support of the structural causative factors of conflict, Olabode and Ajibade [15] further enumerates several structural factors which researchers have identified as contributory to conflict between crop farmers and cattle herders to include "resource scarcity, decreasing interdependence of pastoral and agricultural economies, institutional failure to resolve conflicts, the larger political context and historical context or cultural differences between herdsmen and farmers".

The USAID (2005) asserts that the existence of other factors which cause and most cases escalates violent conflicts notwithstanding, "livelihood failure can contribute to the emergence of conflict by weakening the social fabric making people resort to desperate means to obtain resources and deepening vulnerability to exploitation by those with an interest in promoting conflict for political or economic gain". Also as the negative effect of conflict on the community and individual levels becomes unbearable, the ideological causes of conflict most often will tend to be supplemented by other causes associated with self-protection and or restoration of means of living. The inter-group conflict theory is relevant to this study because it reflects the causative factors of the incessant conflict between cattle herders and crop farmers as opposing groups in Kogi State; which essentially is propelled by the imperative of environmental security, competition for land and means of livelihood of herdsmen and the host communities.

**Methodology:** The study was conducted in Kogi State, Nigeria. The area is chosen because it is one of the States in Nigeria that have recorded the highest number of

herder/farmers conflict. It has very good vegetation for grazing as it is located on the fringe of the rain forest, the guinea savanna zone and on the flood plains of the rivers Benue and Niger [9]. The area lies approximately within latitudes 7°49'N and longitude 6°45'E with a land mass of 30, 354, 74 Km<sup>2</sup> and a population of 3,278,487(National Population Commission, NPC, 2006).

Multi-stage sampling technique involving both Purposive and Random Sampling Techniques were employed in the selection of 160 crop farmers for this study. Data were collected using well-structured questionnaire augmented by interview schedule. Data collected were analysed with Descriptive and Inferential Statistics. Objectives (i), (ii), (iii), (v) and (vi) were achieved with descriptive statistics such as frequency distribution tables, percentages and mean while objective (iv) was actualized using ordinary least square analysis.

**The Inclusion and Exclusion Criteria of Farmers (Sampling Procedure):** Multi-stage sampling technique was employed in the selection of respondents for this study. In the first stage, one local government area was purposively selected from each of the four agricultural zones, based on the level of experience of farmer/herder conflict.

In the second stage, purposive sampling was used to select four villages from each of the LGA depending on the level of farmer/herders conflict, making a total of 16 villages. In the third stage, simple random sampling technique was employed to select 50 farmers each from Dekina and Ibaji, while 30 respondents each were selected from kaba/Bunu and Adavi LGA respectively. This is because from the reconnaissance survey carried out, there were more farmers in Ibaji and Dekina than in Kaba/Bunu and Adavi, which led to the proportional selection of farmers in the area. This gave a sample size of 160 respondents that was used for the study.

**RESULTS AND DISCUSSION**

Result on age and gender show that the majority (61%) of the respondents were aged between 31 and 50 years, with (76%) male and (24%) having an average age of 49 years. This implies that crop farmers in Kogi state are middle aged people who were still energetic and hence productive and within the economically active age to carry out farming activities.

Table 1: Frequency Distribution of the crop farmers by their Socio-economic Characteristics (n =160).

Variable	Frequency	Percentage (%)
<b>Age</b>		
20-30	11	6.88
31-40	17	10.63
41-50	83	51.88
>50	49	30.63
<b>Total</b>	<b>160</b>	<b>100</b>
<b>Sex</b>		
Male	123	76.88
Female	37	23.13
<b>Total</b>	<b>160</b>	<b>100</b>
<b>Level of Education</b>		
Never Attended	23	14.38
Primary	63	39.37
Secondary	40	25.00
Tertiary	34	21.25
<b>Total</b>	<b>160</b>	<b>100</b>
<b>Household size</b>		
1-5	23	14.38
6-10	128	80.00
>11	9	5.62
<b>Total</b>	<b>160</b>	<b>100</b>
<b>Marital Status</b>		
Single	7	4.38
Married	142	88.75
widowed	8	5.00
Divorced	3	1.88
<b>Total</b>	<b>160</b>	<b>100</b>
<b>Farming Experience</b>		
1-15	66	41.25
16-30	90	56.25
31-45	3	1.88
> 45	1	0.63
<b>Total</b>	<b>160</b>	<b>100</b>

Source: Field data, 2018

The result on level of education and household size showed that over 80% of the crop farmers had formal education at various level with an average household size of 7 persons implying that there was high level of literacy and large household size among the farmers in the study area.

The result on marital status showed that majority 88.75% of the crop farmers were married with an average of 17 years of farming experience. This shows that the farmers had adequate exposure to farming activities.

**Major Causes of Conflict between Herdsmen and Farmers:** The major causes of farmer-herder conflict were examined using a four point Likert type rating scale (LTRS). The result from the crop farmers' perspective show that: the major cause of the conflict was destruction

Table 2: Summary of Table 1. Frequency Distribution of the Crop Farmers by their Socio-economic Characteristics (n =160)

Variable	Percentage	Remarks
Age (41-50)	51.88	Middle aged very energetic to do farm work
Sex (male)	76.88	Most male have access to land and herding
Level of Education (Primary)	39.37	Not highly educated
Household size (6-10)	80.00	To serve for familylabour
Marital Status (married)	88.75	Due to early carrier in farming and herding
Farming Experience (16-30)	56.25	Mostly experience in farming and herding

Table 3: Major Causes of Conflict between Herdsmen and Farmers

Variable	Mean	Standard Deviation	Remark
Destruction of crops	3.83	0.29	Major cause
Competition for land	3.60	0.47	Major cause
Indiscriminate bush burning	3.48	0.45	Major cause
Stray cattle into crop farms	3.45	0.52	Major cause
Disregard to traditional authorities	3.41	0.49	Major cause
Contamination of stream	3.34	0.50	Major cause
Sexual harassment of women by herdsmen	2.76	0.60	Major cause
Indiscriminate defecation by cattle on roads	2.36	0.83	Minor cause
Burning of range land, fadama and houses	2.05	0.90	Minor cause
Encroachment of grazing land	2.01	0.83	Minor cause
Harassment of nomads by host youths	1.95	0.77	Minor cause

Source: Field data, 2018

of crops by cattle with an average of (3.83). This was followed by competition for land (3.60), indiscriminate bush burning by herders which causes destruction to crops on the field was also considered as a major source of conflicts between farmers and herders with an average of (3.48). This is true because during the dry season, grasses and forage dry up and the herdsmen believe that if the dried vegetation is burnt, fresh pasture would regenerate. In the process of burning, the fire spreads into adjoining farms. Disregard for the host traditional authority was equally seen as a major cause of conflict with an average of (3.41).

Another major cause of conflict as opined by crop farmers was contamination of streams by cattle herds with an average of (3.34) and female harassment by the herdsmen especially when cases of rape were established with an average of (2.76). This finding is in agreement with the study done by [25] which stated that destruction of crops, disregard for traditional authorities and contamination of stream were the major causes of conflict between herdsmen and crop farmers. However crop farmers regarded encroachment of grazing land (mean = 2.01), harassment of herdsmen (mean = 1.93), indiscriminate defecation by cattle on roads (mean = 2.36) and burning of fadama houses (mean = 2.05) as minor causes of conflict essentially because farmers do not have the courage to harass or confront the herdsmen for fear of being maimed or killed. In addition, indiscriminate defecation by cattle on roads can be over looked as it

does not constitute any direct economic loss, while burning of fadama houses seldom happens.

**Extent of Agricultural and Socioeconomic Losses Incurred by Crop Farmers:** The result on agricultural losses took various forms; about 81% of the crop farmers lost between 40 to 70% of their land, 13% lost above 80% of their land while only 6.24% lost 0 to 30% of their land to farmer-herder conflict. About 86% of them lost between 40 to 80% of their crops to farmer-herder conflict. While 88% of them indicated to have lost 40 to 70% of their properties. About 74% of the respondents lost between 40 to 70% of their stored produce to farmer-herder conflict. While 14% of them lost about 80% of their farm equipment. Finally, about 56% of them were unable to repay 80% of the loan they took, 75% of the respondents recorded above 80% decrease in output, while only 4.38% recorded 0 to 30% decrease in output.

To examine further, the extent of agricultural and socio-economic losses, a four point (LTRS) was used and the result show that majority of the respondents suffered various losses from farmer-herder conflict, especially economic losses. Many of the losses were categorized by the respondents as high extent. These were, loss of land (mean = 3.66), loss of crops (mean = 3.65), reduction in output (mean = 3.53), loss of properties (mean = 3.53), scarcity of food (mean = 3.4), loss of produce in storage (mean = 3.37) and inability to repay loan (mean = 3.32). These losses implied reduction in farm production and

Table 4: Agricultural Losses Incurred by Crop Farmers

Land lost to farmer herder conflict			Crop lost to farmer herder conflict		
Losses (%)	Frequency	Percentage	Losses (%)	Frequency	Percentage
0-30	10	6.24	0-30	10	6.24
40-70	129	80.63	40-70	137	85.63
>80	21	13.13	>80	13	8.13
Total	160	100	Total	160	100
Properties lost to farmer/herder conflict			Stored produce lost to conflict		
Losses (%)	Frequency	Percentage	Losses (%)	Frequency	Percentage
0-30	12	7.50	0-30	19	11.88
40-70	141	88.13	40-70	119	74.38
>80	7	4.38	>80	22	13.75
Total	160	100	Total	160	100
Loans unable to repay			Recorded decrease in output		
Losses (%)	Frequency	Percentage	Losses (%)	Frequency	Percentage
0-30	7	4.38	0-30	11	6.88
40-70	63	39.38	40-70	29	18.13
>80	90	56.25	>80	120	75.00
Total	160	100	Total	160	100
Farm equipment lost to farmer/herder conflict					
Losses (%)	Frequency	Percentage	Losses (%)	Frequency	Percentage
0-30	17	10.63			
40-70	120	75.00			
>80	23	14.38			
Total	160	100			

Source: Field data, 2018

Table 5: Extent of Agricultural and Socioeconomic Losses Incurred by Crop Farmers

Variable	Mean	Standard Deviation	Remarks
Loss of land	3.66	0.42	High extent
Loss of crops	3.65	0.45	High extent
Loss of properties	3.53	0.46	High extent
Reduction in output	3.53	0.46	High extent
Scarcity of food item	3.40	0.51	High extent
Loss of produce in storage	3.37	0.53	High extent
Inability to repay loan	3.32	0.47	High extent
Interruption to education of children	2.48	0.87	Low extent
Displacement	2.35	0.90	Low extent
Impairment and disabilities	2.35	0.90	Low extent
Loss of farm equipment	2.18	0.88	Low extent

Source: Field data, 2018

income of the crop farmers. From the analyses, displacement (mean = 2.35), interruption of children’s education (mean = 2.48), impairment and disability (mean = 2.35) and loss of farm equipment (mean = 2.18) were not regarded as severe economic losses as compared to the major ones. This is in agreement with similar studies by Nyong and Fiki [11] who reported that the economic effect of the conflict situation could be seen in terms of losses associated with destruction of homes, farmlands,

community assets, loss of produce in storage and household properties. This shows that there is diminishing fortunes of agricultural productivity in the study area.

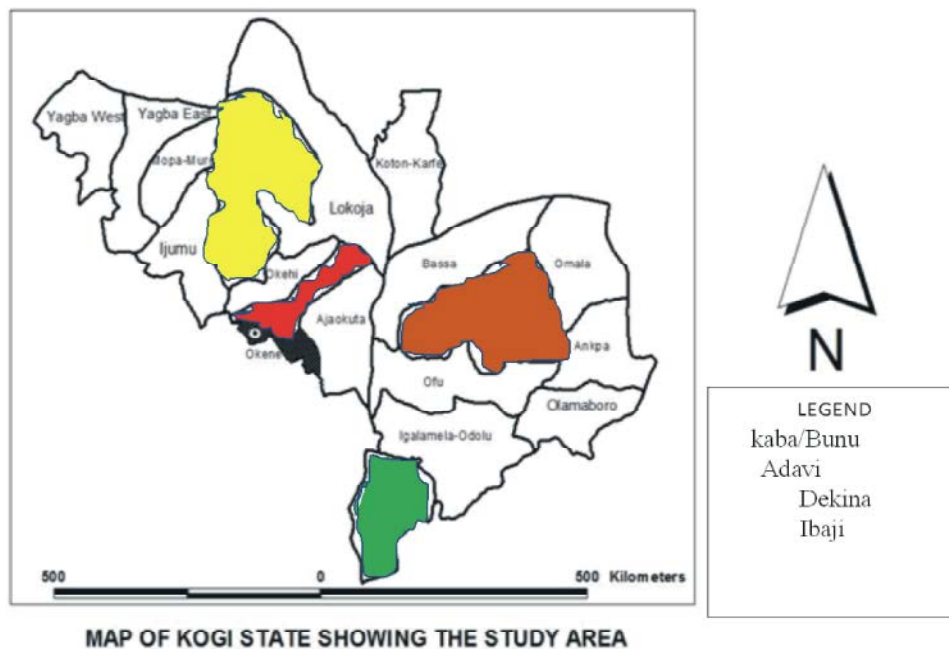
**Determinants of the Effect of Conflict on the Farmers**

**Farm Income:** From the results of multiple regression analysis on the effect of the conflict on farmers’ farm income, the semi-log functional form was chosen as the

Table 6: Regression Result Showing the Factors Influencing Farmers Farm Income

Variables	Linear	Semi-Log++	Double Log	Exponential
Constant	69894.2 (-0.80)	11.34576 (39.27)	10.06746 (15.23)	274445 (5.31)
Farm location	872.9684 (0.17)	0.0048573 (0.30)	0.2064458 (-1.47)	79916.81** (-1.84)
Fear of going to farm	1238.923 (0.35)	-0.6467767** (-2.23)	-108202.3** (2.67)	-0.1843172** (2.42)
land lost	119585.3*** (4.11)	-0.355153*** (-3.70)	-0.711486 (-0.78)	-24902.86 (-0.89)
Crop lost	-154619.8** (-2.32)	-0.5104033** (-2.33)	-0.0122677 (0.21)	3558.558 (0.20)
Contamination of stream	-20338.84 (-0.72)	-0.0029622 (-0.30)	-0.0433998 (0.61)	-6917.717 (-0.32)
Fight with herdsmen	-7382.599 (-1.48)	-0139768 (-0.85)	-0.2025571** (-1.85)	-5161.988 (-0.16)
Uncontrolled grazing	-26022.01 (-0.35)	-0.6645899** (-2.07)	-0.0791136 (-0.71)	-14944.08 (-0.44)
Farming Experience	2275.875 (1.03)	0.0032197 (0.44)	0.2687874** (2.05)	0.9026562*** (6.09)
Sexual harassment	1793.244*** (-0.06)	0.1848491** (-2.02)	-76640.3** (-2.26)	-411389.6** (-2.02)
Educational level	30736.26 (6.63)	0.105008*** (6.87)	0.8622357*** (5.15)	0.0236281** (2.39)
Household size	9953.977 (1.33)	0.0199651 (0.81)	0.2348109 (1.24)	-25206.22 (-0.70)
Credit availability	22726.27 (0.56)	0.1016452 (0.76)	0.0077772 (0.07)	1.837694 (1.03)
R <sup>2</sup>	0.450	0.695	0.603	0.495
Adjusted R <sup>2</sup>	0.405	0.646	0.546	0.446
F-Ratio	10.02	22.38	4.70	9.87

\*\*\*, \*\*, denote significance at 1% and 5% levels respectively. Figures in parenthesis are t-values ++: Lead equation





lead equation and the result showed a coefficient of multiple determination ( $R^2$ ) of 0.69 implied that 69% of the variation on the farmers' farm income were accounted for by the independent variables. The F-value of (22.38) indicated that the overall equation was highly significant at ( $p < 0.01$ ) probability level. Six of the variables tested were statistically significant. Educational level attained was positive and statistically significant at 1% level of probability. This implied that the more educated a farmer is the more enlightened he or she is in managing conflict and adopting coping strategies. This result is in agreement with Nyong and Fiki [7], who stated that level of educational attained is likely to affect the degree of one's business alertness and ability to seize business initiatives and advantages; hence, increased income.

Number of times the fear of herdsmen prevented crop farmers from going to farm had a negative effect on farmers' income and was statistically significant at 5% level of probability. The result is in consonance with *a priori* expectation. The sign implied that the more farmers avoided farming due to fear of herdsmen, the less their farm income. Crop farmers were scared of going to their farms for fear of being killed, maimed or sexually harassed, this has resulted in decreased agricultural production and consequently, reduction in farm income.

Size of crop farm lost had a negative relationship and was statistically significant at 1% level of probability. The sign of the variable is in consonance with *a priori* expectation too. The result implied that as size of crop farm lost increased, the income of farmers decreased and vice versa. Land lost has not only created an impediment on the survival of the host communities, but has for instance, led to crop-farmers abandoning farming for other occupations like Okada riding and trading.

Loss of crops due to bush burning was negative and was statistically significant at 5% level of probability. The sign of the variable is in agreement with *a priori* expectation. The result implied that as loss of crops due to bush burning increased, the income of farmers decreased and vice versa. Reduction in income and output of crop farmers may also occur as a result of indiscriminate bush burning and destruction of crops by herdsmen which led to either partial or total loss of crops by the farmers. The effect on crop yield, therefore has negative effect on the affected farmers' income. This tends to negatively affect farmers' savings, credit repayment ability, as well as the food security and economic welfare of rural and urban dwellers that depend on these farmers for food supply, thus, farming and rural/agricultural development is

discouraged. This finding is consistent with that of Musa and shabu [17] who reported that many farmers lost part or the whole of their crops as result of bush burning.

Uncontrolled grazing by herdsmen was negative and was statistically significant at 5% level of probability. The sign of the variable is in consonance with *a priori* expectation. The result implied that as uncontrolled gazing increased, the farmer's income decreased and vice versa. This is because herdsmen most often allow their cattle to graze on fallow land continuously and over-grazing emanates therefrom. This causes erosion, soil compaction, destroying soil texture and structure, increasing cost of working on the land, etc.

Female sexual harassment was negative and statistically significant at 5% level of probability. It agrees with *a priori* expectation that as female sexual harassment increased, their farm income decreased, this is because female farmers were scared to go to farm for fear of being maimed or raped. This has drastically reduced agricultural labour force and hence farm production and income in the area.

Therefore, the result meant that the activities of herdsmen significantly influence farmers' farm income. Hence, the null hypothesis was rejected and the alternative, accepted.

#### **Computed from field data, 2018 Farmers Coping Strategy:**

The result on coping strategies adopted by the crop farmers showed that most of the farmers' generally used a combination of strategies, as no single strategy is enough to bring the needed succor to the farmers. In the institutional measure, 80.8% of the respondents depended on compensation from State Emergency Management Agency (SEMA) to cushion the effect of farmer-herder conflict, while 75.5% used borrowing of loan to diversify means of livelihood. About 75% used selling of asset and 60% resorted to short term migration. 65% used shifting to other jobs, while 30% of the farmers used sowing less as coping strategy.

In support seeking measures, it was found that assistance from relatives (70%) was the most commonly used measure in ameliorating the effects of conflict, followed by seeking help from traditional institutions with 60%. A vast majority of the respondents did not use litigation as a coping strategy, despite the fact that there are regulations regarding the use of agricultural land in the study area. This may be due to the respondents' decision to accept the situation as their fate. Seeking help

Table 7: Frequency Distribution of Farmers Coping Strategies

Variables	Frequency	Percentage
<b>Institutional Measures</b>		
1. Compensation of losses from SEMA	129	80.8
2. Borrowing of loan to diversify means of livelihood	120	75.5
3. Selling of asset	120	75.0
4. Shifting to other jobs	104	65.0
5. Short term migration	94	60.0
6. Sowing less	49	30.0
<b>Support Seeking Measures</b>		
7. Help from relations	110	70.0
8. Help from village leaders	94	60.0
9. Help from local Government	49	30.0
<b>Emotion-oriented Measures</b>		
10. Accepting conflict as fate	110	70.0
11. Praying for peace	94	60.0
12. Pretending the conflict wasn't bad	17	10.0

Source: Field data, 2018

Table 8: Mean and Standard Deviation of Level of Intensity of Coping Strategies Used by Crop Farmers in Kogi State

Variables (Institutional measures)	Mean	Standard Deviation	Remarks
1. Compensation from SEMA	3.65	0.53	very intensified
2. Borrowing of loan to diversify means of livelihood	3.50	0.38	very intensified
3. Selling of asset	3.49	0.51	very intensified
4. Short term migration	2.95	0.46	Intensified
5. Sowing less	2.20	0.64	Not intensified
6. Shifting to another job	2.80	0.56	Intensified
<b>Support Seeking Measures</b>			
7. Help from relations	3.46	0.50	very intensified
8. Help from village leaders	3.40	0.60	very intensified
9. Help from Local Government	2.30	0.61	Not intensified
<b>Emotion-oriented Measures</b>			
10. Accepting conflict as fate	3.35	0.51	Intensified
11. Praying for peace	3.20	0.53	Intensified
12. Pretending the conflict was not bad	1.90	0.75	Not intensified

Source: Field data, 2018

from local governments (20%) was the least adopted coping strategy by farmers, perhaps because there was no enabling environment for that to occur.

Accepting the conflict situation as act of fate (70%) was found to be the most commonly used emotion-oriented coping strategy. The ability to accept the situation with equanimity among farmers is not only a psychological coping strategy, but is also capable of reducing the escalation of violent conflict between the crop farmers and herdsmen. 60% percent resorted to praying for peace, indicating their level of religious attachment. While only 10% pretended that the conflict was not bad, indicating that pretense was not a common coping strategy among the respondents.

To examine further, the degree of use of the aforementioned Institutional support seeking and Emotion-oriented measures, the level of intensity of use of the measures were examined using a 4-point Likert Type Rating Scale. The following measures were highly intensified by the respondents with their mean score greater or equal to 3 (MS= 3); compensation from SEMA (mean = 3.65), borrowing of loan to diversify means of livelihood (mean = 3.50) and selling of asset (mean = 3.49). The remaining institutional measures were intensified with their mean score below 3 (MS= 3) these were short term migration (mean = 2.95) and shifting to other jobs (mean = 2.80) while sowing less was not intensified (mean = 2.20).

Table 9: Institutional and Government Strategies towards Resolving Conflict

Variable	Mean	Standard Deviation	Remark
Traditional rulers	3.61	0.27	Major institution
Farmers association	3.35	0.49	Major institution
Police	2.62	0.64	Major institution
Law court	2.17	0.68	Major institution

Source; Field data, 2018

Table 10: Strategies towards Resolving Farmer/herders Conflict

Variable	Mean	Standard Deviation	Remark
Compensation	3.60	0.40	Major strategy
Peaceful resolution	3.53	0.53	Major strategy
Verbal warning	3.35	0.46	Major strategy

Source; Field data, 2018

In the support seeking measures, help from relations (mean = 3.46) and help from village leaders (mean = 3.40) were very much intensified while help from local government (mean = 2.30) was not intensified.

In the emotion-oriented measures, accepting conflict as fate (mean = 3.35) praying for peace (mean = 3.20) were much intensified while pretending conflict was not bad (mean = 1.9) was not intensified by the respondents as coping strategy to farmer-herder conflict.

**Institutional and Government Strategies towards Resolving Conflict:** Institutional and governmental strategies towards resolving conflict were examined using a four-point LTRS. From the analysis, most of the respondents (mean = 3.61) reported traditional rulers as the major arbitrator of conflict involving crop farmers and herdsman in the study area. This was followed by Farmers Association (mean = 3.35) and the Police (mean = 2.62) while Law Court was (mean = 2.17). Ordinarily, one would have thought that the formal means of social control (Police and Court) would be the most preferred conflict resolution agencies due to their being more specialized, informed and neutral.

However, results of this study showed that almost half of the respondents reported traditional rulers as the major arbitrator of conflict involving Farmers and herdsman. This is in agreement with similar study of Onuoha [8], who reported that traditional leader was mostly used by crop farmers to resolve conflict. The reason for this choice may not be unconnected with the fact that valuable time is usually lost when cases are taken to the police or court in investigation and prosecution which sometimes defeats the purpose. This result shows that informal traditional mechanisms for conflict resolution are still functional in the study area.

Strategy towards resolving farmer/herders conflict was examined using a four-point LTRS. The result showed that, the respondents received compensation (mean = 3.60) in return for the losses suffered due to damages to their crops and farm land. This was followed by peaceful resolution (mean = 3.53) and verbal warning with (mean = 3.35). The choice of compensation by farmers as a way of settling conflict may be to reduce the loss suffered and to prevent future likelihood of the conflict being repeated.

## CONCLUSION

Therefore, this study conclude that that there are 11 possible causes of farmer-herder conflict as perceived by the farmers with destruction of crops (mean = 3.83) the major cause as 85% of the respondents lost over 80% of their crops; that the phenomenon of herder-farmer conflict in Kogi State typifies what is known as resource conflict in contemporary literature. This thrives in an atmosphere of ecological scarcity and competition, as well as livelihood crisis. The problem has been accentuated by the global trend of climate change which has led to the shrinking of ecological space and resources, leading to intense pressure on and competition for, the available resources.

Also, the study concluded that farmers herders' conflict had great effects on farm income and other socioeconomic attributes of the crop farmers.

Finally, the study identified some coping strategies that were used by the farmers to cushion the effect of farmer-herder conflict in Kogi State such as selling of assets, borrowing of loan, short term migration and shifting to other jobs amongst others.

**Recommendation:** The study now recommends that extension agents should carry out enlightenment campaign programmes aimed at educating the people on the origin, nature and effects of conflicts on their socio-economic life as this will also expose the people to early warning signs of conflicts in order to nib them in the bud. Governmental agencies/ministries responsible for agriculture, lands, geographical information systems, forestry and natural resources should ensure proper delineation and regular revision of stock routes. The government should make policies that allow cattle rearing on intensive or semi-intensive system of grazing and greater fodder production to feed the cattle especially in times of scarcity and during the dry season. The government should institute at community level a community security system with emphasis on training people on conflict prevention, resolution and management. Government should also make some financial assistance available for affected persons and community to help cushion the effect. Above all, government should as a matter of urgency consider building of cattle ranches by cattle farmers as is conventional in civilized societies of the world.

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