



EFFECTS OF CONFLICT BETWEEN CROP AND LIVESTOCK FARMERS ON AGRICULTURAL PRODUCTION IN NORTHERN PLATEAU STATE, NIGERIA

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ABSTRACT

The study examined the effect of conflicts between crop and livestock farmers on agricultural production in the Northern Plateau State. A multistage sampling technique was used to select 81 crop and 55 livestock farmers for the research. Primary data were collected using a structured questionnaire. Data were analysed using both descriptive and inferential statistics. The results for the study showed that the majority (66.13%) of both crop and livestock farmers were male and above 50 years old. It also revealed that both crop and livestock farmers appeared to be formally educated (33.87%). More so, farm size, output, and the herd size of farmers before and after the conflict were all compared. The result showed that they were significantly different at $p < 0.001$. It therefore revealed that conflict has a positive effect on farm size, output and herd size of farmers. The major constraints to conflict resolution include the use of law enforcement structures with mean scores of (5.87, 6.11), a lack of punishing conflict perpetrators (4.90, 5.58), weak policies (4.58) and a poor implementation of policies by the government (5.58). The study concluded that conflict had a positive effect on agricultural production (farm size, output, and herd size of farmers). The study recommended that dialogue, instead of the use of law enforcement structures, ranching, educating crop and livestock farmers, punishing perpetrators of conflict and full implementation of policies by the government, among others, will go a long way in resolving conflict in the study area.

Keywords: Conflicts, Farmers, Effects, Crops, Livestock.

INTRODUCTION

Agricultural production in Nigeria remains the backbone of rural livelihoods, especially in the northern regions where both crop and livestock farming are dominant. However, the growing incidence of conflict between crop farmers and livestock herders poses a significant threat to agricultural productivity and rural food security (Bolarinwa *et al.*, 2021). In Northern Plateau State, the increasing frequency and intensity of these conflicts have destroyed crops, lost of livestock, displaced farmers, and disrupted agricultural activities, ultimately threatening the region's food systems and socio-economic stability (Omomowo, 2021).

These conflicts are primarily driven by competition over access to land and water resources, exacerbated by climate variability, population growth, and weak enforcement of land use and grazing regulations (Blench, 2019). Traditional transhumance patterns by pastoralists often clash with sedentary farming practices, leading to disputes over farmland encroachment and cattle grazing. This phenomenon, when poorly managed, escalates into violent clashes with devastating consequences for agricultural communities (Ahmed & Adisa, 2020). The persistent nature of these conflicts has caused widespread displacement of farming populations and significant reductions in crop yields and livestock assets (Edeh *et al.*, 2020).

The effects are more pronounced in Northern Plateau State due to its agro-pastoral composition and history of farmer-herder interactions. Research shows that such conflicts not only reduce the quantity and quality of agricultural output but also discourage investment in agriculture, limit access to markets, and increase poverty among rural households (Ayanlade *et al.*, 2020; Okoli *et al.*, 2023). Therefore, understanding the specific impacts of crop-livestock conflict on agricultural



production in this region is vital for informing conflict-sensitive agricultural policies and sustainable rural development strategies.

The study aimed to assess the effects of conflicts between crop and livestock farmers on agricultural production in Northern Plateau State, Nigeria. The specific objectives were to;

- i. describe the socio-economic characteristics of the respondents in the study area;
- ii. determine the effects of conflict between crop and livestock farmers on agricultural production in the study area, and;
- iii. identify constraints to resolving conflict between crop and livestock farmers.

MATERIALS AND METHODS

The Study Area

The study was conducted in the Central zone of Plateau State. Plateau State is located in the north-central zone of Nigeria and lies between Latitude 8° 30' and 10° 30'N, Longitude 7°30' and 13°37'E with a land mass covering 30,913 sq. kilometres. The monthly maximum and minimum temperatures are 20°C and 15°C, respectively. The mean annual rainfall is about 1450mm, and the relative humidity of 60%. The state has an estimated population of 3,178,712 (NPC, 2007 estimate), and 3.78 million (NPC, 2013 est). It is bounded by Kaduna and Bauchi states on the north, Taraba on the east, and Nasarawa on the south and west. The Jos Plateau rises to about 5,250 feet (1600m) above sea level in the north-central state's part, and the Benue River Valley stretches along the southeast border (Price, 2019). Although there are wooded valleys in the southeast, the vegetation is mostly open grassland, which is suitable for grazing and farming.

Based on soils, climate, and typical farming systems, the state is classified into three distinct agro-ecological zones, namely, the lowland moist savannah, which falls within southern Guinea, and the Savannah rain forest, having extensive low-lying flat land with high water holding capacity favourable for the production of rice, yam, cassava, melon and groundnut. The mid-altitude zone (the area of study) falls within 500-1,500 meters above sea level, with soils that are sandy clay and heavy rains. Predominantly, maize, Irish potato, and assorted vegetables are produced.

There is a high concentration of livestock and poultry, such as cattle, sheep, goats, layers, broilers, cross-bred local chickens and quails, and production of crops like millet, groundnut, sorghum, and cowpea. It has open grassland vegetation usually used for grazing and farming with notable steep-sloping mountains around the area (FAO, 2018). Global System Mobile (GSM) Network services like Globacom, Airtel, Etisalat, and MTN exist.

Sampling Procedure and Sampling Size

The target populations for this study are the crop and livestock farmers. A multi-stage sampling technique was used to select the respondents for the study. The first stage involved a purposive selection Northern Zone of Plateau State. This selection was based on the frequency of occurrence of conflicts between crop and livestock farmers in the study area. The second stage also involves the purposive selection of two local governments in the Northern zone, namely Barkin Ladi and Riyom, as a result of the frequent occurrence of conflict.

The third stage involved purposive sampling of four communities in Barkin Ladi and two in Riyom Local Government Areas. The selection of these communities is a result of the frequent occurrence of conflict between crop farmers and livestock farmers in those communities. In the fourth stage, a total of 81 crop farmers and 55 livestock farmers were randomly selected from the communities, giving a total sample size of 136 respondents, as shown in Table 1.

Table 1: Sample Size Selection Plan for Crop and Livestock Farmers

LGA	Community	Crop Farmers		Livestock farmers		Total sample size (10%)
		N ₁	n ₁	N ₂	n ₂	n ₁ + n ₂
BarkinLadi	Gashish	215	21	153	15	36
	Ropp	113	11	98	9	20
	Fan	110	11	75	7	18
	Foron	90	9	51	5	14
Riyom	Jol	97	9	92	9	18
	Bachit	211	20	102	10	30
Total		836	81	571	55	136

N₁= Population of crop farmers; n₁ = sample size of crop farmers

N₂= Population of livestock farmers; n₂ = sample size of livestock farmers

Method of Data Collection

Data for the study were collected from primary sources using a questionnaire. Trained enumerators from PADP were used to administer the questionnaire to the respondents and retrieve them. The questionnaire consisted of six (6) sections: A, B, C, D, E and F. Section A covers socio economic characteristics of the respondents, section B covered information on the causes of conflict among the respondents in the study area, section C captured information on methods of conflict resolution as perceived by the respondents, Section D sought information on the effect of conflict between crop and livestock farmers, and section E collected information on constraints to conflict resolutions.

Analytical Techniques

Data were analysed using both descriptive and inferential statistics.

Descriptive statistics

Descriptive statistics such as frequency distribution, percentages and means were used to analyse and describe the socio-economic characteristics of the crop and livestock farmers. Frequency distribution is an organised display of data that shows the number of observations from the data set that fall into each of a set of mutually exclusive class. Frequency distribution is to organize the data items into a more compact form without obscuring the essential information contained in the values. Thus, a frequency distribution is simply the classification of a group of data items according to some observable features. It is explained by the model:

$$y = \frac{\sum xf}{n} \times 100 \quad . . . (1)$$

Where:

y = observed variable

f = frequency

n = sample size

Five-point Likert scale

A five-point Likert scale was adopted (as applied by Lawal *et al.*, 2013): strongly agree (5), agree (4), undecided (3), disagree (2), strongly disagree (1). The mean value for the perceived causes of conflict was determined as:

$$\bar{x}_s = \frac{\sum x}{n} \quad . . . (2)$$

Where, \bar{x} of each constraint was computed by multiplying the frequency of each response scale with its appropriate nominal value and dividing the sum by the study sample size.

Where:

\bar{x} = mean score;

Σ = summation;

F= frequency;

n = nominal value;

nr = number of respondents

$$\bar{x} = \frac{1+2+3+4+5}{5} = 3$$



From these responses, a mean score below 3 was regarded as not being a severe constraint to conflict resolution, while a mean score above 3 was regarded as being severe.

Student's Test

The t-test, according to Bevens (2023), is used to compare two sample distributions, which should be approximately normal, with data collected on either an interval or ratio scale of measurement. For a two-sample test, the Student's t-test is given by:

$$t = \frac{\bar{X} - \bar{Y}}{\sqrt{\frac{sx^2}{Nx} + \frac{sy^2}{Ny}}} \quad \dots (4)$$

Where:

t = Student t-test

\bar{X} = Observed mean of crop farmers before and after conflict

\bar{Y} = Observed mean of livestock farmers before and after conflict

sx^2 = square of the standard deviation of arable farmers

sy^2 = square of the standard deviation of livestock farmers

Nx = sample size of arable farmers

Ny = sample size of livestock farmers

Statistical package for social sciences (SPSS), Version 23, was used to compare the farm size cultivated by crop farmers before and after conflict, output and number of livestock before and after conflict. This explained the effect of conflict on agricultural production with respect to crop and livestock production. According to Bevens (2023), the higher the value of t in a t-test statistic, it shows there is a significant difference between the means of the two samples.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents

The socio-economic parameters examined in this study include: age, sex, marital status, household size, educational background, experience in farming and rearing of livestock, farm and land size, and occupation (as seen in Tables 2 & 3).

Gender describes the position of an individual in terms of feminine and masculine. These are put as male and female. The pooled results presented in Table 2 show that 66.13% of the respondents were male, suggesting that men are more involved in activities that lead to resource-based conflicts. This supports the argument that men are predominantly responsible for herding and land management in Nigeria, hence more exposed to inter-farmer disputes (Edeh *et al.*, 2020). Male dominance in these sectors often results in more aggressive territorial defence during conflict situations (Ayinde *et al.*, 2022). This implies that gender dynamics may influence the intensity and management of conflict, with men being key actors in both escalation and resolution.

Age refers to the stage of development of an individual, either young or old. The results on age revealed 28.2% of crop farmers were older than 30 years of age. Those within the ranges of 11 - 20 years and 21 - 30 years constituted 6.4% and 16.7% of the respondents, respectively (Table 2). Similarly, the livestock farmers older than 30 years represented 21.7% while those in the age brackets of 11-20 years and 21-30 years made up 4.3% and 19.6% respectively. The pooled result, however, revealed that both farmers and livestock farmers were within 51 years and above. These age groups are often the economically responsible population who manage farms and herds, and are thus highly susceptible to the negative impacts of conflicts (Ahmed & Adisa, 2020). This productive age group bears the brunt of farm destruction and livestock theft, which undermines food production and rural stability. The implication is that conflict affects the most active demography in agriculture, reducing regional output and food security.

Marital status means living singly or in a matrimonial relationship, which includes past and present positions such as divorced, widowed and so on. Table 2 revealed that 66.7% and 71.7% of the crop and livestock farmers were married, respectively. Those who were single represented 17.9% and 17.4% for crop and livestock farmers, respectively. The widows constituted 15.4% and 8.7% of the crop and livestock farmers on the whole. The higher proportion of the married respondents may be



explained by the age bracket in the results of this study. Large households require more resources, which increases dependency on staple farming activities, often disrupted by crop-livestock conflict (Omomowo, 2021). Conflict can therefore lead to economic stress on family units, affecting household welfare and food consumption patterns.

Household size refers to the total number of individuals (wives, children, grandchildren and extended family members) that live with and feed from the household. The pooled result of the study on household size shows that 59.68% of the respondents (arable crop and livestock farmers) had a household size of between 6 and 10 persons, which places pressure on land and income resources. Larger families are also more affected by farm damage and income loss from conflict, compounding food insecurity (Edeh *et al.*, 2020). Those with household sizes of 1 to 5 persons, 11 and 15 persons and greater than 15 persons constituted 25.81%, 11.29% and 3.22%, respectively. Even though high household size is an important indicator of farm labour, it increases vulnerability and decreases adaptive capacity during periods of agricultural disruption.

Education connotes the formal training an individual has obtained. This is represented by the number of years a person spent in formal school. It is believed that educated persons may be more open to dialogue during conflicts (Sani *et al.*, 2021). Educationally, about 33.37% of the pooled results in the study area showed that the respondents had a tertiary level of education. The respondents (Arable crop and livestock farmers) with secondary and primary levels of education constituted 29.03% and 5.64% of the respondents, respectively. The respondents with informal education make up 15.32%. 37.2% of the arable crop farmers had secondary levels of education, while 29.5% had tertiary education. The arable crop farmers who had informal education were 1.3%, for the livestock farmers, 41.3% had tertiary education, while 39.1% had informal education, 15.2% had secondary level of education, and 4.3% had tertiary education. Based on the findings of this study, it can be inferred that most crop and livestock farmers were literate. They could read and write, a healthy situation that exposes them to the adoption of technology, which improves their farming activities. Additionally, education plays a crucial role in conflict management and adaptation by providing knowledge of rights and land-use laws. Lower educational attainment among pastoralists may limit their understanding of land use policies or conflict mitigation strategies (Blench, 2019). Conversely, better-educated farmers may have greater access to information and negotiation channels.

Farming experience is the skill and knowledge an individual has acquired over time as a result of repeated/constant practice in a trade. It is similar to education. Experience enhances efficiency and productivity. This is in line with the findings of Kehinde (2011), who said, constant practices result in perfection. Table 2 revealed that crop farmers with farming experience of 21 years and above represented 35.90%, those with experience of 16 and 20 years, 5 and fewer years, 6 and 10 years and 11-15 years made up 24.4%, 16.7%, 15.4% and 7.7% respectively. The livestock farmers had fewer years of experience. Those with 6-10 years of experience accounted for 43.5%. The livestock farmers with 5 and less, 21 years and above, 11- 15 years, and 16 - 20 years of experience accounted for 21.7%, 17.4%, 10.9%, and 6.5% respectively. The pooled data for crop and livestock farmers experience which are 21 years and above accounted for 29.03%. Those with 6 - 10 years were 25.81%, those with 5 years and below were 18.55%, those with 16 and 20 years were 17.74%, and those with 11 and 15 years were 8.8%. The mean years of experience for the crop and livestock farmers were 15 and 10 years, respectively. This is in tandem with the findings of Ayinde *et al.* (2022), who stated that long-term farmers are more likely to have faced repeated conflict cycles and may experience greater cumulative losses. These experienced farmers also understand the historical roots of conflicts, which may help in designing targeted interventions. The implication is that prolonged farming experience can both deepen loss and inform sustainable conflict response strategies.

Farm size refers to the size of agricultural land managed mostly by the farmers. Douglas (2018). The pooled result on farm size shows that farmers with farm sizes of between 3-4 hectares represented 44.9%, those with 1-2 hectares accounted for 38.50%, those with 5-6 hectares and 7 hectares and above represent 9% and 7.7% respectively. This means that the arable crop farmers in the study area are into subsistence farming. This may be due to high pressure on land due to an increase in population, vis-à-vis the traditional land tenure of inheritance, whereby the land is usually



divided into pieces and shared among several family members. The implication is an increase in the tendency of the farmers to encroach on land reserves and livestock tracts, especially cattle routes, thereby creating room for conflict. Smaller farm sizes increase the risk of overlap with grazing routes, particularly in communal land settings, which often triggers disputes (Okoli *et al.*, 2023). Limited land availability intensifies the struggle for space between crop and livestock farmers. This means that smaller and communal landholdings amplify land-use conflict, especially during peak cultivation or grazing seasons.

On herd size, 52.2% of the livestock farmers in the study area had 20 and a smaller number of animals. Those with 21 - 40 animals constituted 21.7%, those with 81-100 animals were 15.20%, and those with 41-60 and 61-80 animals represented 4.30% each. Herdsmen who had more than 100 animals accounted for 2.2%. According to Bolarinwa *et al* (2021), larger herds are more likely to stray into farms, causing damage and igniting tensions. Also, herders with large stocks suffer more when retaliatory attacks or cattle rustling occur. It implies that herd size correlates with both the likelihood of conflict and the scale of economic loss suffered.

Occupation refers to a specific and sustained activity a person does to earn a living. Concerning major occupation, the result of the study shows that 63.71% of the crop farmers had farming as their primary occupation, while 60.90% are livestock farmers. This suggests that there was almost an equal distribution of the two groups in the study area. The result means that the respondents were into agricultural production activities, which makes competition for farming and grazing over land resources between the two groups and a possible consequence of conflict. (Okoli *et al.*2014).

Table 2: Distribution of Respondents Based on Age, Sex, Age, Marital Status, Household size and, educational status.

Socio-economic parameters	Crop Farmers (78)		Livestock Farmers (46)		Pooled Data (120)	
	F	%	F	%	F	%
Gender						
Male	41	52.6	41	89.1	82	66.13
Female	37	47.4	5	10.9	42	33.87
Age (years)						
11-20	5	6.4	2	4.3	7	5.65
21-30	13	16.7	9	19.6	22	17.74
31-40	22	28.2	10	21.7	32	25.81
41-50	18	23.1	10	21.7	28	22.58
51-60	20	25.6	15	32.6	35	28.22
Marital Status						
Single	14	17.9	8	17.4	22	17.74
Married	52	66.7	33	71.7	85	68.55
Widow	12	15.4	4	8.7	16	12.90
Divorce	-	-	1	2.2	1	0.81
Household size						
1-5	15	19.2	17	37.0	32	25.81
6-10	54	69.2	20	43.5	74	59.68
11-15	6	7.7	8	17.4	14	1.29
16-20	3	3.8	1	2.2	4	3.22
Education						
No formal Edu.	1	1.3	18	39.1	19	15.32
Primary	5	6.4	2	4.3	7	5.64
Secondary	29	37.2	7	15.2	36	29.03
Tertiary	23	29.5	19	41.3	42	33.87

Source: Field Survey, 2020 Keys: F = Frequency, % = Percentage

Table 3: Distribution of Respondents Based on Farming Experience, Farm Size, Herd and Occupation.

Socio-economic parameters	Arable Farmers (78)		Livestock Farmers (46)		Pooled Data (120)	
	F	%	F	%	F	%
Farming Experience						
1-5	13	16.7	10	21.7	23	18.55
6-10	12	15.4	20	43.5	32	25.81
11-15	6	7.7	5	10.9	11	8.87
16-20	19	24.4	3	6.5	22	17.74
21 and above	28	35.9	8	17.4	36	29.03
Farm size(ha)						
1-2	30	38.5			30	38.5
3-4	35	44.9			35	44.9
5-6	7	9.0			7	9.0
7 and >	6	7.7			6	7.7
Herd size(no.)						
1-20			24	52.2	24	52.2
21-40			10	21.7	10	21.7
41-60			2	4.3	2	4.3
61-80			2	4.3	2	4.3
81-100			7	13.2	7	15.2
100 and >			1	2.2	1	2.2
Occupation						
Farming	67	88.5	10	21.7	79	63.71
Trading	7	9.0	4	8.7	11	8.87
Other	1	1.3	-	-	1	0.81
Livestock rearing	-	-	28	60.9	28	60.9
Non- Agric trade	-	-	4	8.7	4	8.7

Source: Field Survey, 2020

Effect of Conflict on Crop and Livestock Products

The effect of conflict between crop and livestock farmers was determined using a paired t-test. A comparative analysis of the farm size and output of crop farmers before and after conflict was conducted to find out if or not there was a significant difference. Similarly, the herd size of livestock farmers before and after conflict was compared to determine if there were effects of conflict on livestock production. (as shown in Table 5). The result revealed that the mean farm size of crop farmers before and after conflict was (mean 4.83, SD 2.48) and (mean 3.25, SD 1.94), with a difference of 1.58 hectares and t-value (77) 9.51, significant at $P < 0.001$. The result further showed a significant reduction in the farm size of the crop farmers. The reduction in the farm size under cultivation by arable crop farmers may be attributed to the conflict between them and the livestock farmers. The implication of the reduction in farm size is low output. This agrees with the findings of Adelakun *et al.* (2015), who found that the majority of farmers suffered severe losses from farmer-pastoralist conflict, leading to a reduction in output.

Similarly, the mean output of crop farmers before and after conflict was (mean 35.93, SD 29.53) and (mean 29.23, SD 29.19), respectively, with a difference of 6.7. The t-value (77) 4.73, which was significant ($P < 0.001$). The significant difference suggests a reduction in the output of crop farmers as a result of the conflict. This means that conflict had a reducing effect on crop production. Falanta *et al.* (2018) revealed that farmer-herder conflict often leads to loss of crop, livestock and even human lives

On the herd size of the livestock farmers, a mean herd size before and after the conflict (mean 47.17 SD 39.28) and (mean 31.34 SD 29.59) was recorded, respectively. The mean difference was 16 herd sizes with t-value (45) 6.41, which was significant ($P < 0.001$). The result shows a reduction in herds' size of the livestock farmers, which could be a result of conflict. The reduction in the herd's size may result from either the loss of animals due to killing or rustling. The implication of this is a reduction in the supply of animals and a low income.



Together, the results of this research revealed that conflict has a positive effect on agricultural production (farm size, output, and herd size of farmers). This is supported by the work of Moritz (2010), who found that farmer-herder conflict not only has a direct impact on the lives and livelihoods of those involved but also disrupts and threatens the sustainability of agriculture and pastoral production

Table 4: Effect of Conflict on Agricultural Production before and after Conflict

Parameters	Mean	SD	T	Df	Sig
Farm size before	4.83	2.48	9.51	77	0.000***
Farm size after	3.25	1.94			
Output before	35.93	29.53	4.73	77	0.000***
Output after	29.23	29.66			
Herd size before	47.13	39.28	6.41	45	0.000***
Herd size after	31.34	29.59			

***Significant at $p < .001$

Constraints to Conflict Resolution amongst Arable and Livestock Farmers

The study examined challenges to conflict resolution between crop and livestock farmers. The constraints were ranked in order as perceived by the respondents according to their severity in Table 8. The most severe constraint was the use of law enforcement structure in handling conflict, which was ranked 1st by both the crop farmers and livestock farmers as a very serious constraint to handling disputes among them. This was followed by a lack of punishing conflict perpetrators, as was ranked 2nd by the crop farmers, while the livestock farmers ranked the lack of educating conflicting parties 2nd as a constraint to resolving conflict among them.

Both the crop and livestock farmers agreed that the lack of policy implementation by the government is a constraint to conflict resolution, as ranked 3rd. The crop farmers ranked the lack of educating conflicting parties 4th, and the livestock farmers revealed that ethnic rivalry ranked 4th as a constraint to resolving conflict among them. On the other hand, the crop farmers ranked ethnic rivalry 5th, and the livestock farmers ranked lack of goodwill among conflicting parties 5th in that order, respectively.

The crop and livestock farmers agreed that the lack of compensation to affected persons is one of the constraints to resolving conflict in the study area. This was ranked 7th and 6th respectively. This was revealed in the work of Mohammed *et al.* (2020), who state that from all the recommendations for solutions to farmer-herder conflict, respondents voted in favour of paying compensation, which reduces the tendency of reprisal attack, and encourages resettlement for a new productive life.



Table 5: Constraints to Resolving Conflict between Crop and Livestock Farmers

Constraints	Crop farmers			Livestock farmers		
	F	Mean	Rank	F	mean	Rank
Use of law enforcement structure by the government	40	5.87	(1 st)	16	6.11	1 st
Inadequate punishment for the perpetrator	23	4.90	(2 nd)	16	5.58	2 nd
Weak policies and poor implementation by the government	21	4.58	(3 rd)	21	5.58	2 nd
Inadequate education for the conflicting parties	27	4.00	(4 th)	12	4.71	3 rd
Ethnic Rivalry among crop and livestock farmers	21	3.98	(5 th)	13	4.36	4 th
Poor goodwill among conflicting parties	17	3.55	(6 th)	12	3.91	5 th
Inadequate compensation for affected persons by defaulters of the government		3.38	(7 th)		3.79	6 th

Source: Field Survey, 2020

CONCLUSION AND RECOMMENDATIONS

Crop-livestock farmers' conflicts are destructive and hurt agricultural production in Northern Plateau State, Nigeria. From the study, it was discovered that both crop and livestock farmers felt the negative effects of conflict on their production. The study further revealed that scarcity of land due to urbanisation, among others, was a major cause of the conflict. Lack of access to water, stealing of crops and inadequate grazing reserves are some of the major causes of conflict in the study area.

Conflict resolution mechanisms among crop and livestock farmers include: intervention by traditional leaders, payment of compensation to affected victims by defaulters, and educating crop and livestock farmers on the effects of conflict. Conflict among crop and livestock farmers reduces farmland size under cultivation and the herd size, thereby reducing crop and livestock production.

From the findings, the following recommendations were made:

- Dialogue should be employed as a means of conflict resolution instead of using law enforcement personnel.
- Compensation should be given to the affected victims of the arable crop and livestock farmers' conflict. This will cushion the effect of the loss and reduce tension buildup and possible reprisal attacks.
- Government policies should be properly implemented. If this is possible, it will gain people's confidence in the government to address the conflict situation between livestock and arable crop farmers.
- Traditional leaders should be well involved in finding solutions to crop and livestock farmers' conflicts, having representation from local leadership.
- Extension agents should be involved in educating crop and livestock farmers, as this will lead to better understanding and awareness of realistic conflict resolution mechanisms.

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