



Herders-Farmers Conflict: Implications for Arable Crop Production in Kajola Local Government Area, State, Oyo State, Nigeria.

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Abstract

Nigerian arable crop production has suffered from the herders-farmers conflict. This study examined how herders-farmers violence affected arable crop output in Kajola Local Government, Oyo State. Using an interview guide, random sampling was used to collect data from 125 arable crop producers. Data were analysed using descriptive statistics like percentages, frequency distribution, and mean and inferential statistics like Chi-square and t-test. 56.6 per cent of farmers were men, and 34.4 per cent were women. About 38.4% of responders are 31-40 years old, and 13.6% of farmers are uneducated. Most farmers (64.8%) saw a drop in production after cow and sheep invasion. Herders' contempt for conventional rules and regulations (84 per cent), polluting of streams (60 per cent), devastation of crops (90.4 per cent), overgrazing of fallow land (64.2 per cent), and revenge attacks (60 per cent) were the main points of complaint. According to respondents, herders's agricultural devastation (97.6%), water pollution (93.6%), kidnapping (87.2%), and financial exploitation (78.4%) were the most common kinds of conflict. Chi-square analysis found significant associations ($P \leq 0.05$) between herders-farmers conflict and arable crop output, including contempt for customary rules, pollution of streams, crop destruction, bush burning, and tribalism ($\chi^2 = 30.331$, $\chi^2 = 7.419$). The study found that conflict in the research area hurt the yield of arable crops. To avoid tribal war, the government, local security groups, and the leaders of the herders should step in and improve the security forces to settle disagreements.

Keywords: Effects, herders, farmers, conflict, arable crop production

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Introduction

Arable crops constitute Nigeria's primary source of staple meals and income, foreign exchange earnings, and job opportunities. A vast array of annual crops, including vegetables, melon, groundnuts, yams, cassava, cowpea, sorghum, rice, and soybeans, are considered arable crops.

Due to the vital significance that arable crops play in Nigerian diets, their cultivation is necessary. Despite these, the dispute between the farmers and herders has negatively impacted its output. Despite all these, its production had been impaired due to conflicts

between the farmers and herders. The past few decades have witnessed a devising resurgence of nomadic herders and rural farmers' violence in some parts of Nigeria (Amao *et al.*, 2018.). The herders are nomadic, herding cattle, goats and sheep across their environment's vast dry grasslands, keeping isolated from the local farming communities, making them the world's largest pastoral nomadic group (Eyekpimi, 2016). Conflicts between pastoralists and farmers have existed since the beginning of agriculture, and they have increased or decreased in intensity and frequency depending on economic, environmental, and other factors (Bello, 2013; Alao *et al.*, 2019). The conflicts had far-reaching economic, production and socio-psychological effects on the households of most respondents (Olagbemi *et al.*, 2022). The herders move towards the south wherever the grass is greener and frequently interfere with areas long claimed or cultivated by settled farmers; conflicts typically ensue (Olaniyan *et al.* 2015). In several places, herders have clashed with farmers and their host community over cows' destruction of crops, farmers' encroachment on grazing reserves and indiscriminate bush burning by nomads that unremarkably results in the loss of crops (Olaleye *et al.*, 2010; Ofem & Inyang, 2014). The root cause of these conflicts is unconnected to the competition over the essential resources, such as pastures and water attached to their livelihoods, coupled with the incidence of climate change as well as accompanying desert encroachment (Akanle *et al.*, 2021) According to Adisa *et al.* (2022), all these factors have reduced arable and grazing lands, causing cattle herders to migrate to the south for animal pasture. The farmer-herder conflict in recent times has taken another dimension of ethnicity and religion (Adisa *et al.*, 2021). It has constituted a significant threat by putting pressure on the land and thus provoking conflict between them (Alao *et al.*, 2019). Climate change can be fundamentally summarised as a long-term alteration in global temperature, precipitation, wind patterns and other climate indicators that occur over time (Gbadebo *et al.*, 2022). In addition, available grazing land is diminishing at an alarming rate, and livestock pathways are blocked through land use, urbanisation and frontiers. The increase in

population, drying of waterholes and shifting in rainfall patterns leading to delayed drought due to the changing climate affects both pastoralists and farmers (Olagbemi *et al.*, 2022). The cause is primarily based on competition to access land and freshwater (for grazing and farming) resources, which have become acutely scarce (Audu, 2013).

The herders' outbreak is usually serious; the farmers always perform their farming activities in fear because they never know when the next attack will be, which contributes to a reduction in the production of arable crops, affecting farmers' livelihood and the nation's economic state. The destruction has a direct impact on the people's livelihood as their economic activities are tied to environmental resources like water, land (soil) and vegetation (herds and food crops) (Bello, 2013). It has rendered all efforts to achieve sustainable goals one and two futile, and the realisation of food security is challenging in the affected communities. To maintain a sustainable production of arable crops in Nigeria, lasting solutions must be proffered to this bottleneck that nose dive food security and sustainable development goals. The conflict between farmers and herders could be averted or reduced when government policies are formulated and implemented to set a guiding principle on future cooperation between the two groups because agricultural production requires an enabling environment to reach its maximum potential ((Amao *et al.*, 2018).

The Herders-Farmers conflict in Kajola Local Government Area, Oyo State, Nigeria, has significant implications for arable crop production. Studies have shown that this conflict arises from various factors such as land disputes, destruction of crops, and disregard for local traditional authorities (Salisu, 2022). The clashes over land, water resources, and grazing have substantially impacted Nigeria's food supply and demand (Adewale, 2023) and have negatively affected victims' livelihoods, leading to economic and social disruptions (Adisa *et al.*, 2023). Adisa *et al.* (2022) reported that efforts to mitigate the conflict and its implications have been explored in different regions. Mohammed *et al.* (2017) investigated coping strategies utilised by arable crop farmers to survive the crises and cushion the effects of the conflict.

The influence of traditional institutions in managing these conflicts has also been examined, highlighting the role of local governance structures in conflict resolution (Mohammed *et al.*, 2017).

Furthermore, Sangotegbe *et al.* (2016) have also investigated the effectiveness of Local Government Peace and Security Committees in preventing farmer-pastoralist conflicts, emphasising the importance of local initiatives in conflict prevention. Based on these premises, the study sought to ascertain the cause of conflict between herders and arable crop farmers, examine the forms of the attack of herders on the respondents and determine the frequency of occurrence of the attack. It will also examine the control measures employed by the respondents. The study hypothesised that there is no significant relationship between the cause of the conflict and the effect of the conflict on arable crops and that there is no difference between the quantity of farm produce before and after the animal invasion in the study area. The conflict impacts agricultural production, and limited studies have focused explicitly on the effect of the nomad-farmer conflict on food security. Understanding the root causes, exploring coping mechanisms, and enhancing conflict resolution strategies are crucial steps toward mitigating the implications of this conflict on agricultural activities in the region.

Materials and Methods

The Study Area

The study area was Kajola Local Government Area, Oyo State, Southwest Nigeria. It is located between 8°1'59" and longitude 3°21'0"E of Greenwich meridian. The towns and villages comprising Kajola LGA include Okeho, Ilua, Igbogaa, Isemi ile, Iwere-oke, Ilaji-oke, and Ayetoro oke. The population of Kajola LGA is estimated at 173,442, with the vast majority of the area's inhabitants belonging to the Yoruba ethnic division. Kajola LGA occupies a total area of 609 square kilometres and has an average temperature of 28 degrees centigrade. The area is well forested, with an average humidity level of 60 per cent. Crops such as cassava, maize and pepper are cultivated in the area. Trade also flourishes in

the area, with the LGA hosting several markets where various commodities are bought and sold by the area's dwellers. Other critical economic enterprises undertaken by the people of Kajola LGA include textile weaving and dyeing, crafts making, and hunting. The area was specifically chosen for this study based on its arable crop production record, the source of livelihood, and the prevalence of herder attacks in and around the local government over the years.

Method of data collection, analysis

Simple random sampling was employed to draw samples for the study. The population comprised 246 maize and cassava farmers registered with the local government. The sample size comprised 125 arable crop farmers determined through the use of the Taro Yamane sampling size determination formula, $n = N / (1 + N(e)^2)$

Where n signifies the sample size,

N signifies the population under study,

e signifies the margin error (0.05).

An interview guide was used to elicit information from the farmers on their socioeconomic characteristics, causes of herders-farmers conflict, forms of the attack, and frequency. The causes of the conflict were measured on a three-point response scale of 'major cause, (3 points) minor cause, (2 points) and not a cause, (1 point) and expressed in percentages. The forms and frequency of the herders' attacks were measured on a dichotomous scale of yes(2) or no(1). Descriptive statistical tools such as tables, percentages and frequencies were used to present and summarise the data collected. Inferential statistics, such as a t-test, was used to measure the mean difference, while Pearson Product Moment Correlation (PPMC) determined the strength of the relationship between variables.

Results and Discussion

Table 1 shows that less than half (34.4%) of the respondents were between the age bracket of 41-50, with an approximate mean age of 44. This indicates that the arable crop farmers were within the active workforce, were the key producers of arable crops, and had the energy required to protest against conflicting issues. This result corroborates Adisa *et al.* (2022),

who observed 44.2 mean age for respondents in a similar study. Also, the study revealed that 65.6% of the respondents are male and 34.4% are female farmers, implying that males are more involved in arable crop production. This is similar to the findings of Adisa (2022), where the male farmers were (70.3%) and female farmers were (29.7%). The majority (88.8%) of the respondents were married. This could imply the availability of family labour and more hands in arable crop production. Also, most (60.8%) respondents post primary school education. This is similar to the study of Gbadebo (2022), who reported that 60% of his respondents had post-primary school education in a study conducted in Oyo State, Nigeria. The result also shows that more than half (54.4%) of the arable crop farmers were mainly Christian, while other belong to others belonged to other religions. This could inform a peaceful coexistence among the farming community. Almost half (49.6%) of the farmers had 6-10 persons per household, with a mean of eight persons. This result agrees with the report of Alao *et al.* (2019), who reported that approximately half (51.8%) of their respondents had a household

Causes of conflict

Results in Table 2 show that crop destruction (90.4%) was ranked first (2.85) among the causes of conflict by the farmers. The findings of this study are consistent with those of Adisa *et al.* (2022), that the majority (93.3%) claimed that the herders caused crop destruction and intentionally allowed their cattle to graze on crops, which is the main source of farmers' livelihood, without any cause. Also, disregard for traditional rules and regulations of the rural communities in the study areas ranked second (2.82), corroborating the report of Ofem & Inyang (2014), who also identified disrespect of traditional authorities and the negligence or lack of payment of levies for local crops and livestock while harassment of the nomads by

size of 6-10 people in a similar study. In addition, cassava and maize were the common arable crops grown by the majority (68%) of the farmers. Also, the study shows that 47.2% and 36.8% of the farmers had experience of 1-10 years and 11-20 years in arable crop farming, respectively. This suggests that the respondents could have previously experienced herders' invasion. The finding of this study is inconsistent with the report of Adisa (2022) that most arable crop farmers had between 21 and 30 years of farming experience. The reason could be that their respondents were older. In addition, before the invasion, 94.4% of the farmers produced between 1 and 30 tons per hectare, with a mean of 17.22 tons.

In contrast, after the invasion, the production of arable crops in the study area reduced to an average of 10.17 tons per hectare, as reported by the majority (64.8%) of the farmers. This could hint that food shortage and hunger are the likely primary consequences of herders-farmers conflict. Also, most respondents (68%) cultivated an average of 11.95ha for arable crops. This is an indication that the respondents are large producers of arable crops.

the host community was a minor cause (53.6%) and female harassment by the nomads was not a cause (30.4%) of the conflict. The results also show that overgrazing of fallow land (2.60) was ranked third, and contamination of stream water was ranked fourth of the causes of conflict. Land encroachment (2.49) and reprisal attack (2.47) were ranked 5th and sixth by the respondents. Another cause of the herders-farmers conflict was tribalism (2.26), bush burning (2.21), harassment of female farmers (2.10), indiscriminate defecation (2.04) of herds (2.04), and harassment of nomads by the host communities. These results indicate that the herders initiated conflict because of the slightest cause. These results are similar to the observations of Adisa *et al.* (2022).

Table 1: Socioeconomic characteristics

Variables	Frequency (n=125)	Percentage (%)	Mean	SD
Age (year)				
≤30	10	8	43.86	9.30
31-50	91	72.8		
51-70	24	19.2		
Sex				
Male	82	65.6		
Female	43	34.4		
Marital status				
Single	9	7.2		
Married	111	88.8		
Divorced	2	1.6		
Widowed	3	2.4		
Religion				
Christianity	68	54.4		
Islam	52	41.6		
Traditional	5	4.0		
Education				
No formal	17	13.6		
Primary	32	25.6		
Secondary	41	32.8		
Tertiary	35	28.0		
Farming experience (year)				
≤ 5	59	47.2	15.54	10.89
6-10	59	47.2		
11-15	5	4.0		
16-20	2	1.6		
Annual income (₦)				
≤50000	79	63.2		#681,680
51000-100000	32	25.6		
101000-150000	6	4.8		
151000-200000	7	5.6		
201000-250000	0	0		
251000-300000	1	0.8		
Farm size (ha)				
≤1-.3	37	29.6	7.72	11.95
4-6	85	68		
7-10	6	4.8		

Source: Field survey, 2022

Table 2: Causes of conflict (n=125)

Variables	Major cause F (%)	Minor cause F (%)	Not cause (%)	Mean	SD	Rank
Destruction of crops by herds	113(90.4)	5(4.0)	7(5.6)	2.85	0.49	1 st
Disregard for traditional rules and regulation	105(84)	18(14.4)	2(1.6)	2.82	0.42	2 nd
Overgrazing of fallow land	84(67.2)	32(25.6)	9(7.2)	2.60	0.62	3 rd
Contamination of streams by herds	75(60)	42(33.6)	8(6.4)	2.54	0.62	4 th
Land encroachment	77(61.6)	32(25.6)	16(12.8)	2.49	0.71	5 th
Reprisal attack	75(60)	35(28)	15(12)	2.47	0.73	6 th
Tribalism	56(44.8)	45(36)	24(19.2)	2.26	0.76	7 th
Bush burning by herders	51(40.8)	49(39.2)	25(20)	2.21	0.76	8 th
Female harassment by the herders	50(40)	38(30.4)	37(29.6)	2.10	0.83	9 th
Indiscriminate defecation of cattle on roads	30(24)	70(56)	25(20)	2.04	0.67	10 th
Harassment of nomads by host communities	21(16.8)	57(53.6)	37(29.6)	1.87	0.67	11 th

Source: Field Survey, 2022

Forms of the Attack of the Herders on the Arable Crop Farmers

Table 3 shows that the majority of the farmers revealed that forms of the attack of the herders include the destruction of crops (97.6%), pollution of water bodies (93.6%), destruction of farmland (91.6%), infliction of injuries of farmers (84.8%), financial exploitation (78.4%), destruction of farmers' houses and properties (70.4%), the killing of farmers (69.6%) and rapping (61.6%). These results show that the invasion of herders on the communities under study took different forms and the effect could be mild on arable crop production and

reduction in farm families as a result of diversification into non-farm livelihoods. This study's findings are consistent with Aderinto *et al.*'s report (2020), which ranked crop destruction first and water contamination second among the forms of conflict and harassment of farmers with dangerous weapons third. Also, Alao *et al.* (2019) report that loss of properties (84.2%) and sustenance of injury (73.7%) were reported by the majority of their respondents.

Table 3: Farmers' forms of herders attack

Forms of Herders' Attack	Frequency (%)
Destruction of crops	122 (97.6)
Pollution of water bodies	117 (93.6)
Destruction of farmlands	114 (91.2)
Kidnapping	109 (87.2)
Inflicting injuries on farmers	106 (84.8)
Financial exploitation	98 (78.4)
Destruction of farmer's houses and properties	88 (70.4)
Killing of farmers	87(69.6)
Raping	77 (61.6)

Source: Field Survey, 2022

Frequency of Occurrence of the Attack

Results in Table 4 reveal the invasion of the herders based on the frequency of occurrence. The findings from this study show that pollution of water bodies (74.4%) and destruction of crops (52.8%) and farmland (43.0%) were the major attacks that occurred daily. In addition, financial exploitation (53.1%) and infliction of injuries on farmers (45.3%) occurred weekly. Also, the destruction of farmers' properties (41.6%) and kidnapping (41.3%) are monthly

occurrences, while rapping (42.3%) and killing of farmers (42.2%) usually occur yearly. This indicates that the herders' attack on the farmers and their livelihood occurs yearly. The implication is that since the farming environment is neither conducive nor peaceful, the production of arable crops is dwindling. Resultant effects like unemployment, hunger, poverty, idleness and insecurity will probably accompany this

Table 4: Frequency of occurrence of the herders' attack

Frequency of herders's attacks	Daily (%)	Weekly (%)	Monthly (%)	Yearly (%)
Killing of farmers	3(3.5)	19(22.1)	26(30.2)	38(42.2)
Infliction of injuries on farmers	26(24.5)	48(45.3)	24(22.6)	8(7.5)
Destruction of farmlands	49(43.0)	31(27.2)	20(17.5)	14(12.3)
Destruction of crops	65(52.8)	38(30.9)	14(11.4)	6(4.9)
Raping	7(9.0)	11(14.1)	27(34.6)	33(42.3)
Financial exploitation	9(9.2)	52(53.1)	28(28.6)	9(9.2)
Kidnapping of farmers	17(15.6)	24(22.0)	45(41.3)	23(21.1)
Pollution of water bodies	87(74.4)	15(12.8)	8(6.8)	7(6.0)
Destruction of farmers' properties	12(13.5)	15(16.9)	37(41.6)	25(28.1)

Source: Field Survey, 2022

Effect of the Conflict on Arable Crop Production

Table 6 shows that crop damage by cattle (97.6%) has a significant effect on arable crop production, reduction in the output and income of farmers (92.8) is also a leading effect according to most of the respondents, so as displacement of farmers (60%), this is related to a study that stated that the clashes of herders and farmers have resulted in population displacement, low agricultural output, and result in scarcity of agricultural produce (Odoh & Chilaka, 2012). Agricultural sectors, accommodating productive youths and adults, have become strained and volatile. Farmers–herders conflicts have been attributed to the prevailing displacement of people from rural

centres, which causes the urban centres to compete for the available opportunities (Odoh & Chilaka, 2012). The agricultural sector's contribution to the growth and development of the Nigerian economy cannot be given little credit (Olaoye, 2014). As such, inadequate supplies of agricultural produce will consequently lead to worries, unrest, food insecurities, and overall adverse effects on the national economy and security. It is known that agricultural enterprises are the main occupation of people in the Local Government Area of Kajola. It, therefore, implies that any challenge that affected farming would harm the people's livelihood.

TABLE 6: Distribution of arable crop farmers according to the effect of the conflict on arable crop production

Variables	No effect F (%)	Minor effect F (%)	Major effect F (%)	Mean ($\bar{X}$)	S.D.	Rank
Displacement of farmers	9(7.2)	41(32.8)	75(60.0)	2.53	0.63	11 th
Destruction of farmlands	2(1.6)	17(13.6)	106(84.8)	2.83	0.42	4 th
Crop damage by cattle	0(0)	3(2.4)	122(97.6)	2.98	0.15	1 st
Land encroachment	4(3.2)	26(20.8)	95(76.0)	2.73	0.51	6 th
Destruction of irrigation sources	10(8.0)	21(16.8)	94(75.2)	2.67	0.62	7 th
Environmental degradation	9(7.2)	29(23.2)	87(69.6)	2.62	0.62	8 th
Pollution of Water Point	12(9.6)	27(21.6)	86(68.8)	2.59	0.66	9 th
Loss or shortage of production	1(0.8)	12(9.6)	112(89.6)	2.89	0.34	3 rd
Loss of produce in storage	3(2.4)	49(39.2)	73(58.4)	2.56	0.55	10 th
Reduction in output and income of farmers	4(3.2)	5(4.0)	116(92.8)	2.90	0.40	2 nd
Scarcity of agricultural products	4(3.2)	18(14.4)	103(82.4)	2.79	0.48	5 th
Loss of house and properties	12(9.6)	37(29.6)	76(60.8)	2.51	0.67	12 th
Community infrastructure damages	16(12.8)	68(54.4)	41(32.8)	2.20	0.65	13 th

Source: Field Survey, 2022

Control Measures of Herder Attack

Table 5 shows that establishing a system of mediating with the herders in their local language (77.6%) was primarily used as the control measure adopted by the respondents in the study area. This was done by calling the herders to order by the chiefs, sitting them down to communicate with them with an interpreter, and educating them on the harm

their activities are causing to the study area and the implications on the nation. Other control measures rarely used by the respondents include strict supervision of grazing by herders (36.8%), education of feed preservation and storage for herders (30.4%), the establishment of pasture and ranches (24.8%) and promotion of climate-smart agriculture (11.2%).

Table 5: Control Measures of Herder Attack

Control measures	Frequency	Percentage (%)
Strict supervision of grazing by herders	46	36.8
Establishment of pasture	31	24.8
Establishment of ranches	30	24.0
Promoted climate-smart agriculture	14	11.2
Education on feed preservation and storage for herders	38	30.4
Established a system of mediating with the herders in their local language	97	77.6

Source: Field Survey, 2022

Association between the causes of herders-farmers conflict and effect of herders-farmers conflict on arable crop production.

The result in Table 6 shows that there was a significant ($p \leq 0.05$) association between disregard for traditional rules and regulations by herders ($\chi^2=30.331$), contamination of streams by herds ($\chi^2=7.419$), destruction of crops by herds ($\chi^2=11.233$), indiscriminate defecation of cattle on roads ($\chi^2=8.130$), bush burning ($\chi^2=8.130$), tribalism ($\chi^2=8.554$) and effects of

herders-farmers conflict on arable crop production. This could suggest that increasing these variables could translate to a more significant effect on arable crop production. The findings of this study disagreed with Aderinto *et al.* (2020). The probable reason could arise from their consideration of cross-

tabulating the socioeconomic characteristics and the effects of herders' attacks.

Table 6: Chi-square analysis of the relationship between the causes of herders-farmers conflict and its effect on arable crop production

Variables	χ^2 -value	Df	Significant
Disregard for traditional rules and regulation	30.331	2	0.000**
Contamination of streams by herds	7.419	2	0.024*
Destruction of crops by herds	11.233	2	0.004*
Indiscriminate defecation of cattle on roads	8.130	2	0.017*
Bush burning by herders	8.130	2	0.017*
Tribalism	8.554	2	0.014*

P≤0.05

Difference between the quantity of arable crops before and after cattle invasion.

Results in Table 7 show a statistically significant difference ($P \leq 0.05$) between the quantity of arable crops produced before and after the

cattle invasion. This could indicate notable differences in the arable crop produced before and after cattle invasion

Table 7: Test of significant difference between the quantity of farm produce before and after cattle invasion.

Variables	Mean	Mean difference	t-value	p-value	Decision
Quantity of farm produce before cattle invasion	17.22	7.05	1.002	0.000**	Significant
Quantity of farm produce after cattle invasion	10.17		14.527		

Conclusion and Recommendations

The effect of herders-farmers conflict on arable crop production was the focus of this study. The mean age of the respondents was 44 years, and the average household size was eight persons. The majority (60.8) of the respondents possessed a post-primary school certificate. In addition, the destruction of crops by herds ($\chi = 2.85$), disregard for traditional rules and regulations ($\chi = 2.82$), and overgrazing of fallow land ($\chi = 2.60$) were the significant causes of conflict among the respondents and herders. The implication is that the herders were the group that fought the conflict. This is evident in the fact that harassment of nomads by host communities was the most minor cause of the conflict ($\chi = 1.87$).

Furthermore, the destruction of crops, pollution of water bodies and destruction of farmland of the respondents were the forms of attack by herders. The implication is the disruption of farming in the study area, leading to dwindling production, which can cause farmers to diversify into non-farm livelihood activities. This

could significantly affect food security because the production of staple foods is affected.

In addition, the destruction of crops, disregard for traditional rules and regulations of the communities and overgrazing of fallow land were significant causes of conflicts. The implication is that the herders initiated the venom before the respondents retaliated. The study shows that the herders attack the respondents throughout the year. Statistical significant differences existed between the crops produced before and after cattle invasion. The implication is that more arable crops were produced before than after the invasion, which was majorly influenced by farmers' displacement and consistent soil compaction by cattle. Also, a significant relationship existed between the effect and the causes of the conflict review in this study. All control measures against the herders-farmers conflict should be employed for peace to be regained and to retrieve the production capacity of arable crop production. Farm security, such as fencing and

boundaries, should be adequate to prevent cattle encroachment. Also, the government should provide ranches for grazing zones for herders to reduce intruding into farms. Farmers'

associations in the study area should employ the help of vigilantes groups to curb the activities of the herders.

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