

Causes, Preventive Strategies and Impacts of Conflicts between Crop Farmers and Herders on Agricultural Production in Adamawa State, Nigeria

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Received: March 1, 2024|**Accepted:** May 24, 2024|**Published:** June 30, 2024

Abstract: *The study assessed impact of conflicts between farmers and herders on agricultural production in Adamawa state, Nigeria. Three specific objectives, three research questions and three null hypotheses guided the study. A survey research design was adopted for this study. The area of the study was Adamawa state, located in North East zone of Nigeria. The population of this study was 136,347 respondents comprising of 230 community leaders, 94,937 crop farmers and 41,180 cattle herders. Purposive sampling technique was used to select 48 community leaders, 260 crop farmers and 76 Herders, making a total sample of 384 respondents selected to participate in the study. The instrument used for data collection was a 30-item researchers' developed structured questionnaire tagged: Farmers Herders Conflicts Structured Questionnaire (FHCSQ); face validated by three experts, field tried using 20 farmers, 20 herders and 4 community leaders outside of the areas of the study; Cronbach Alpha gave a reliability coefficient of 0.92. The FHCSQ was administered to the respondents by the researchers, assisted by two assistants who interpreted the questionnaire items to the farmers and herdsman in Hausa and Fulfulde Languages for those who cannot read and write and also helped them in ticking the right options as chosen by the respondents. Mean and standard deviation were used to answer research questions 1 to 3; Analysis of Variance (ANOVA) was used to test the hypotheses at 0.05 levels of significance. The results showed that conflicts between farmers and herders had impact on agricultural productivity: causes (overall mean = 3.67), effects on livelihoods (overall mean 3.89) and preventive measures (overall mean = 4.25). There was significant difference in the mean responses of farmers, herders and community leaders on the factors causing farmers' and herders' conflicts ($p = 0.004 \leq 0.05$), but no significant differences in their responses about its impact on livelihoods ($p = 0.053 > 0.05$) and ways of preventing ($p = 0.378 > 0.05$) it in Adamawa State. It was recommended among others that farmers and herders should adhere to their boundaries, discourage land tenure system and bush burning, plant trees to cushion the effects of climate change in the state; Cattle tracks and grazing reserves should be maintained, create new ones to cater for increasing herds and legislations controlling open grazing should be enforced.*

Keywords: Impact, Conflict, Farmer, Herder, Agricultural Production

Introduction

Agriculture, the main source of livelihood in Nigeria has been faced with a lot of challenges such as climate change, fragmentation of cultivable lands, communal clashes over resource control such as land and water; these have led to the disruption of agricultural activities in most states in north east zone of Nigeria. This disruption is mainly as a result of farmers/herders conflicts leading to the destructions of animals, crops on farm lands, displacements of farming communities; putting various sources of livelihood on hold. This is conditioned by factors like the geographic, socio-cultural and demographic composition of the Adamawa State. Similarly,

Citation: Egunsola, Mberekpe & Ferdinand (2024). Causes, Preventive Strategies and Impacts of Conflicts between Crop Farmers and Herders on Agricultural Production in Adamawa State, Nigeria. *International Journal of Agricultural and Home Economics Education* 11(1), 15-29

Egbuta (2018) reported that the depletion of arable land for subsistence farming was largely as a result of increasing urbanization and the adverse effect of climate change, especially along the Lake Chad basin, there is increased struggle between herdsmen and farmers, leading to violent confrontations and conflicts, deaths and forced displacement, as well as the destruction of crops and livestock.

Impact is about what has happened as a result of any phenomenon, this being consequences that a situation has had on those exposed to it or on a larger community, both in the short and long term. According to Onwuaroh, *et al* (2017), impact refers to outcomes, synonymous with effects and results of events. This might be expected and wanted results, as well as unintended and less fortunate outcomes. In the view of Streatfield (2015) it is any effect of a service on an individual or group. Therefore, impact is a formal, evidence-based procedure that assesses the economic, social and environmental effects of an event on people. Ndubuisi (2018) defines conflict as the 'pursuit of incompatible interests and goals by different groups. Aliyu, *et al*, (2018) noted that conflict connotes clash or disagreement between two or more groups who have incompatible differences. It is a situation where two or more parties pursue similar goals but believe that such goals are achievable by just one of them and employ every resource within their disposal to hinder the other party from attaining such goal. According to Boulding (2014) conflict is a situation of competition in which the parties involved are aware of the incompatibility of their potential future positions and in which each party wishes to occupy a position that is incompatible with the wishes of the other. Otite (2013) opined that one critical defining element in a conflict situation is the presence of two or more actors struggling to secure a thing adjudged to be valuable of which if gained by any actor, shall amount to a loss or deprivation to the other actors. The benefit goes with the successor together with access to or control of the value and the loser suffers deprivation, insecurity, followed by the denial of access to such value. Thus, conflict can affect agricultural production in the area of study especially when stakeholders (crop farmers and herders) are at loggerhead.

Mahdi (2018) stated that crop farmers are group of people who cultivate land and produce food crops for human consumption and also for industrial use (raw material). Large scale farmers cultivate large hectares of land most often using modern machines and produce crops in commercial quantity. Small scale farmers use crude implements in the mode of their cultivation to produce goods only in small quantity (subsistence farming). Farmers under this study are mostly the latter, who depend largely on the products they cultivate for survival. Yue (2009) defined farmer in a modern perspective as the entire producers and operators that deploy resources in virtue of the market, guide production based on market requirements, supply the market with new products, and regard commercial activities as their stage. Meanwhile, they have characteristics of independence, self-determination, go-ahead, sociality and innovation compared with traditional farmers. Whether in modern or traditional perspectives, all crop farmers engage in agricultural production.

Food and Agricultural Organization (FAO) (2016) stated that Agricultural production includes food and other crops and livestock husbandry, it is determined by the interaction of farmers with natural resources: biophysical framework of soils, water, temperature, flora and fauna and environmental fluctuations (climate change). In this study, agricultural production means the production of any growing crops, grass, or trees attached to the surface of the land or farm animals with commercial value by farmers. Furthermore, it is the process of transforming

agricultural resources into a form that will give maximum satisfaction to the consumers. Thus, both farmers and herders are actively engaged in agricultural production.

According to Dimelu, *et al* (2017) herders are group of people who keep a herd of animals such as cattle, sheep or goats. The major occupation of a herdsman is taking care of his animals and the family of herders has nothing valuable more than their animals; Ezeonwuka and Igwe (2016) reported that the Fulani herders are undoubtedly the largest pastoral nomadic group in the world, herding goats, Camel, sheep, horse and cattle. With their dominance in the Sahel region, they are the best known and most numerous of all the pastoralists groups in Nigeria (Alhassan, 2013). According to Nze (2015), the Fulani herdsmen by their culture, tradition and occupation, never owned lands nor had any permanent abode. In fact, they cared less about land ownership because they are always on the move. They simply lived with their cattle wherever there was abundance of fodder and absence of Tsetse flies. This type of grazing has often meant travelling long distances from one point to the other and thus intruding into spaces long claimed by settled farmers and has become the source of potential conflicts between them and the sedentary farming population. Conflicts between nomads and sedentary farmers date back to the earliest written records and are mythically symbolized in many cultures. Such conflicts have existed since the beginning of agriculture (Ezeonwuka and Igwe, 2016); they only increased or decreased in intensity and frequency depending on economic, environmental and other factors (Alhassan, 2013). Monod, (2018) noted that the survival of the pastoralist group is built on symbiotic interaction with sedentary farmers. Thus, it becomes apparent that the interdependent linkage flows as each group needs water, land, fodder and other land use for their economic activities. Monod noted that this form of relationship that has existed centuries back has been truncated with many disputes arising across the regions that have grown into widespread violence, deaths, and internal displacement of persons.

According to the United Nations (UN) (2011) some of these conflicts have sadly led to a massive loss of lives and property and to environmental destruction with dire consequences for agricultural production and food shortages. However, the severe crises between farmers and herdsmen is partly due to the transformation of agricultural lands for other uses, global environmental changes, degradation of agricultural soil, erosion of the genetic base of agricultural biodiversity, water scarcity, poor governance, growing demand and changes in consumption patterns, uncontrolled deforestation, and political malfunctions within the country. According to Usman *et al* (2017) about 70% of Nigerians are engaged in agricultural production; two-thirds (2/3) who are mostly low income earners practice subsistence agriculture while the remaining fraction practice commercial farming. They produce cereals such as sorghum, maize, millet, groundnut, cowpea and cotton, tubers such as cassava, yam, cocoyam and other crops like plantain, bananas and other tree crops. In addition to crops, Nigerians engage in the production of livestock, fisheries, forestry and wildlife. Adebisi (2017) stated that Nigeria is generally endowed with abundant natural resources, numerous perennial sources of water and a favorable tropical climate but recently most of these natural endowments are fading away as a result of several factors including man-made factors such as deforestation, bush burning and the ongoing insurgency occupation of the Sambisa forest reserve and natural occurrences such as climate change, which have affected the Fulani cattle-herdsmen grazing of their cattle.

According to Donald and Jo-Ansie, (2010) there has been a lot of conflicting analysis by scholars on the causes of the conflicts as well as the escalation of hostility in the recent years. Many have argued that the scarcity of natural resources had led to conflict which is triggered by competition over the meager resources available. Many cattle routes (*brutali*) and other fields reserved as grazing areas have been converted into farms. This led to decrease in grazing fields thereby forcing the herders to encroach into crop farms which eventually always led to the herders-farmers' conflict (Babagana, *et al* 2019). According to Ikezue and Ezeah (2017) the conflict between pastoralists and farmers has been in existence since the beginning of the practice of agriculture, this conflict is as a result of scarce resources, i.e., land and water, but in recent times the conflict has assumed a different form of insecurity with an increase in large numbers of casualties and displaced people across the affected states. If the conflict is allowed to escalate further, the impacts will be on food and animal products because of the grave loss of animals, crops and valuable properties.

Population growth both for human and cattle has worsened the conflicts between farmers and herdsmen. It has pitted many farming communities against the herdsmen. One major cause is the growing population of Nigeria's cattle population to 25 million cows from 15 million in the past, and the number of cattle is expected to increase to 60 million by 2050 (Fabiya & Otunuga, 2016). In a further contribution, Mwamfupe (2015) and Doyin (2017) posited that population explosion leads to more demand for food and more demand for farm produce, hence more demand for land by the farmers to be able to meet the increasing food demand. This leads to the encroachment of livestock route by the farmers in a bid to enlarge their farms for increase farm yields, the trampling of these supposed livestock routes, which are now other people's farms made conflict to ensue between the farmers and the herdsmen. A large amount of food and water is required to satisfy massive numbers of animals when they are traveling over farmers' lands. Farmers accused the herdsmen of failing to control their cattle and allowing them to damage farmers' crops. However, the herdsmen accused farmers of stealing their cattle and sheep and also blocking cattle routes ((Goke, 2018 & Akorede, 2018).

According to Bill and Melinda Gates Foundation (2017), the crisis has had a significant impact in Adamawa, a state with already stretched resources due to the huge influx of internally displaced persons (IDPs). The number of people reliant on land to farm for food is increasing just when climate change has made farming more difficult. As a result, the land disputes with the herdsmen are likely to increase. Despite the many deaths and federal government statements, there is little sign of the crisis coming to an end. According to Udemezue and Kanu, (2019) activities of cattle herders on crop production can distort economic growth thereby placing this nation into economic disarray that can cause food insecurity in general. To this end the researchers seek to assess the impact of these conflicts on agricultural production and how to urgently proffer solutions to ending the crises in Adamawa state.

This study was anchored on Frustration Aggression theory also known as the frustration aggression displacement theory propounded by Dollard *et al* (1939) in Berkowitz (1989). The theory states that if a goal is being blocked, people often become frustrated. If we are feeling very angry at the source of that frustration, we may become aggressive; therefore, frustration often leads to aggressive behavior. This theory was further developed by Leonard Berkowitz in 1989; saying that exposure to violence in the environment could lead someone to be more aggressive in the face of frustration; and frustration that cannot be expressed directly to the

source may be displaced onto an innocent, yet easier, victim. The theory says that frustration causes aggression, but when the source of the frustration cannot be challenged, the aggression gets displaced onto an innocent target (scapegoat). This theory explains riots and revolutions, which both are believed to be caused by poorer and more deprived sections of society who may express their bottled up frustrations and anger through violence.

Adamawa state has also seen numerous farmers/herder conflicts as a result of herders migration caused by climate change, increased human population, blocking and cultivation of cattle routes, industrialization, and fragmentation of cultivable lands. Egunsola *et al* (2024) in their study on the impact of conflicts between farmers and herders on agricultural produce marketing in Adamawa State, Nigeria reported myriad of factors that were responsible for conflicts between farmers and herders; these include: increase in national herd population, increasing human population, desertification, climate change, more farms are needed for cultivating more food for humans, conversion of pasture lands for grazing and cattle routes into farms, towns and human settlements, lack of data for developing infrastructures in relation to herd and human populations growth, scarcity and competitive access to land and its resources, land tenure system, and insurgency. All these have resulted into insecurity, loss of lives, valuable properties and animals, loss of farms and farm produce, poor transportation of goods, animals and humans, displacement of peoples from their ancestral homes and labor mobility problems. Yahya and Ahmed (2020) found that social and economic factors combined to inflame violent conflicts. The competition between these two Agricultural land user-groups threatens the means of survival in the study area. The study revealed that the major causes of conflict in the study area are the crop damage by cattle, and lawlessness in the society. The loss of expected yield, loss of cattle and loss of human lives and properties are the major effects of conflict. The conflicts sometimes spread and lead to ethnic clashes and armed robbery. Yahaya and Ahmed (2020) studied causes and effects of the conflicts in the study area while Egunsola *et al* (2024) focused on the conflicts impacts on marketing of farm produce but the this study will be concerned with causes, preventive strategies and impacts of conflicts between crop farmers and herders in the study area.

Land disputes between farmers and herders are likely to increase due to the increasing demand for natural resources by both crop farmers and herders. The impact of conflicts between farmers and cattle herders on crop production, pastoral, fishing and marketing has distorted economic growth thereby placing the state and the nation into economic disarray that has caused serious problem in agricultural production in general. For example: clashes between herders and agrarian communities in late 2016 and early 2017 in Demsa Local Government Area (LGA) of Adamawa state left over 30 people dead and hundreds displaced. Herders reportedly attacked over 10 villages in central Adamawa between January and July 2016, killing 100 people and displacing 2,500 (Daily Post, 3/8/2016 and This Day, 30/1/2017). This forms the basis of arguments for this study which sought to assess the impacts of these conflicts between farmers and herders on agricultural production in Adamawa state and how to proffer solutions to ending these crises between farmers and herders in Adamawa state. The main purpose of this study was to assess the impact of conflicts between farmers and herders on agricultural production in Adamawa state, Nigeria. Specifically, the study sought to:

- determine the factors causing farmers/herders conflicts for land use,
- determine the impact of farmers/herders conflicts on the livelihood of farmers and herders; and

- determine measures to be taken to prevent farmers and herders conflict.

The following research questions were formulated to guide the study:

- What are the factors causing farmers/herders conflicts for land use?
- What are the impact of farmers/herders conflicts on livelihood of farmers and herders?
- What are the measures to be taken to prevent Farmers-Herders conflicts?

The following null hypotheses were formulated for the study and tested at 0.05 levels of significance:

H₀₁: There were no significant differences in the mean responses of farmers, herders and community leaders on the factors causing farmers and herders conflicts for land use in Adamawa State.

H₀₂: There were no significant differences in the mean responses of farmers, herders and community leaders on the impact of farmers and herders conflicts on their livelihood in Adamawa State.

H₀₃: There were no significant differences in the mean responses of farmers, herders and community leaders on measures to be taken to prevent farmers and herders conflicts in Adamawa State.

Methodology

The research design used was a survey. The design is a systematic collection of data from population through questionnaire techniques (Sambo, 2008) with the aims of describing, recording, analyzing and interpreting existing conditions that yield valid and reliable education research results (Best and Kahn, 2006). This afforded the researchers direct contacts with the respondents to obtain data from a sample of the population in their natural setting. The area of the study was Adamawa state, located in the North East zone Nigeria between longitudes 12° 43' and 14° 58' East and latitude 9° 32' and 11° 38' North of Greenwich meridian and occupies total area of about 36,917 km² (Adebayo & Tukur, 1999). Adamawa state is bordered on the north and northwest by Borno and Gombe states, on the west and southwest by Taraba state, and on the southeast and east by Republic of Cameroon. The Mandara Mountains lie in the north east part of the state along the Cameroon border, and the Shebshi Mountains rise to Mount Dimlang (6,699 feet [2,042 Meters]) in south east part of the state. Adamawa state is largely covered by short-grass savanna and is drained westward by the Benue River and its tributaries, including the Gongola, Taraba, and Pai Rivers.

Adamawa state is inhabited by the indigenous peoples of Yungur, Bwatiye, Higgi, Kapsiki, Chamba, Margi (Marghi), Kilba, Gude, Wurunkum, Lalla, Burra and Pbata. All these groups are engaged in farming and herding (cattle, goats, sheep), but fishing is also important along the river bank. Groundnuts, cotton, sorghum, millet, rice, and corn (maize) are the main crops. Groundnuts and cotton as well as cattle, dyed skins, and gum Arabic are exported. Adamawa state has a population of 3,178,950 (National Population Census (NPC), 2006). The population of this study was 136,347 respondents comprising of 230 community leaders, 94,937 crop farmers and 41,180 cattle herders in 21 Local Government Areas divided into four Agricultural zones of Adamawa State. Purposive sampling technique was used to select the 8 LGAs out of 21,

48 community leaders, 260 crop farmers and 76 Herders making a total study sample of three hundred and eighty four (384) respondents. The instrument used for data collection was a structured questionnaire developed by the researchers tagged: Farmers Herders Conflicts Structured Questionnaire (FHCSQ) designed to elicit information on impact of conflicts between farmers and herders on agricultural production in Adamawa state. The FHCSQ was a 30 item questionnaire that was divided into three sections, one for each research question and was answered by farmers, cattle herders and community leaders. The instrument was designed on a five (5) point rating scale using the following response options and assigned numerical values: Very High Extent (VHE) 5, High Extent (HE) 4, Moderate Extent (ME) 3, Low Extent (LE) 2 and Very Low Extent (VLE) 1. A cut-off point of 3.00 was used for decision on each of the research questions, obtained thus:

$$\frac{5 + 4 + 3 + 2 + 1}{5} = 3.00$$

The instrument FHCSQ was face validated by three experts and field tried using 20 each of farmers and herders and four community leaders from four local government areas outside the areas of study. Cronbach Alpha was used to determine the reliability coefficient of the instrument and 0.92 was obtained. The instrument was administered to the respondents by the researchers and two research assistants from each Agricultural Zone who interpreted the questionnaire items to the farmers and herdsmen in Hausa and Fulfulde Languages for those who cannot read and write and also helped them in ticking the right options as chosen by the respondents. The return rate was 100 percent. The data collected were analyzed using Statistical Package for Social Sciences (SPSS) version 26; Mean and standard deviation were used in answering research questions 1 to 3, while Analysis of Variance (ANOVA) was used to test the hypotheses at 0.05 levels of significance. The decision rule on each item was based on the cut-off point of 3.00; thus, any item with mean response of ≥ 3.0 was considered "High Extent" while items with mean responses < 3.0 were considered "Low Extent". The decision for the hypothesis was that when the p-value was greater than the α -value, the null hypothesis was accepted and if otherwise, rejected.

Results

Research Question One: What are the factors causing farmers/herders conflicts in Adamawa state?

Table 1: Mean Rating and Standard Deviation of Community Leaders, Farmers and Herders on the Factors Causing Farmers/Herders Conflicts for Land use in Adamawa State

S/NO	ITEMS	$N_C = 48, N_F = 260, N_H = 76, N_T = 384$					Remark
		\bar{x}_C	\bar{x}_F	\bar{x}_H	\bar{x}_G	δ_G	
1.	Crops damage by cattle	4.75	4.72	4.65	4.70	1.04	HE
2.	Encroachment of farmers into cattle tracks	4.63	4.61	4.58	4.60	1.19	HE
3.	Inadequate grazing reserves	4.88	4.86	4.72	4.81	0.74	HE
4.	Lack of access to water points	4.13	4.10	4.00	4.06	0.24	HE
5.	Killing of strayed cattle	3.25	3.02	2.98	3.02	0.32	HE
6.	Indiscriminate bush burning	3.13	3.11	3.08	3.10	0.38	HE
7.	Cattle theft	2.38	2.32	2.29	2.31	0.90	LE
8.	Land tenure system	3.06	3.03	3.01	3.03	0.31	HE
9.	Climate change (e.g. desertification)	4.75	4.74	4.72	4.73	0.98	HE
10.	Corruption by community leaders	3.88	3.85	3.79	3.83	0.68	HE
11.	Irrigation farming	2.25	2.22	2.20	2.21	0.71	LE
Overall Mean		3.67					HE

\bar{x}_C = Mean of Community Leaders, \bar{x}_F = Mean of Farmers, \bar{x}_H = Mean of Herders, \bar{x}_G = Grand Mean, δ_G = Grand Standard deviation, HE = High Extent, LE = Low Extent, N_C = Number of Community Leaders, N_F = Number of Farmers, N_H = Number of Herders, N_T = Total Number of Respondents

Table 1 showed that to a high extent all items considered in the study do cause conflicts (grand mean 3.67) except cattle theft and irrigation farming.

Research Question Two: What are the impact of farmers/herders conflicts on the livelihood of farmers and herders in Adamawa State?

Table 2: Mean Rating and Standard Deviation of Community Leaders, Farmers and Herders on the Impact of Farmers/Herders Conflicts on the Livelihood of Farmers and Herders in Adamawa State

S/NO	ITEMS	$N_C = 48, N_F = 260, N_H = 76, N_T = 384$					Remark
		\bar{x}_C	\bar{x}_F	\bar{x}_H	\bar{x}_G	δ_G	
1.	Loss of crops and livestock	4.63	4.60	4.58	4.60	1.18	HE
2.	Loss of sources of livelihoods	4.69	4.61	4.58	4.61	1.19	HE
3.	Hike in prices of commodities and food stuffs	4.13	4.09	4.05	4.08	0.31	HE
4.	Loss of lives	3.25	3.19	3.14	3.18	0.57	HE
5.	Increased expenditure	4.13	4.10	4.08	4.09	0.29	HE
6.	Destruction of properties	4.75	4.71	4.68	4.71	1.03	HE
7.	Reduction in income and its sources	3.13	3.11	3.06	3.09	0.47	HE
8.	Increased tension in the communities	4.13	4.09	4.05	4.08	0.27	HE
9.	Destructions of infrastructures	4.50	4.48	4.42	4.46	1.37	HE
10.	Reduced productivity	2.25	2.23	1.93	2.12	0.65	LE
11.	Poor quality relationships between farmers and herders	3.75	3.73	3.71	3.72	0.86	HE
Overall Mean		3.89					HE

Table 2 showed that only reduced productivity had low impact on the livelihood of farmers and herders in Adamawa State, all other factors to a high extent had high impact (grand mean 3.89).

Research Question Three: What are the measures to be taken to prevent farmers-herders conflicts in Adamawa State?

Table 3: Mean Rating and Standard Deviation of Community Leaders, Farmers and Herders on the Measures to Prevent Farmers-Herders Conflicts in Adamawa State

		$N_C = 48, N_F = 260, N_H = 76, N_T = 384$					
S/NO	ITEMS	\bar{x}_C	\bar{x}_F	\bar{x}_H	\bar{x}_G	δ_G	Remark
1.	Improved land tenure system and land use plan	4.13	4.08	4.05	4.07	0.26	HE
2.	Increased security in farming communities	4.75	4.71	4.67	4.70	1.04	HE
3.	Banning of open grazing in the state	4.13	4.07	4.00	4.05	0.21	HE
4.	Provision of grazing reserves	4.63	4.57	4.54	4.56	1.21	HE
5.	Stopping bush burning	3.79	3.71	3.69	3.71	0.89	HE
6.	Awareness raising campaigns against conflicts	4.63	4.60	4.57	4.59	1.20	HE
7.	Prompt intervention by authorities	4.90	4.86	4.72	4.81	0.84	HE
8.	Dialogue between farmer and herders	4.06	3.99	3.88	3.95	0.53	HE
9.	Punishment for violence perpetrators	4.75	4.70	4.65	4.69	1.05	HE
10.	Commercialization of farming	3.13	3.11	3.08	3.10	0.62	HE
11.	Practice ranching	4.13	4.08	4.05	4.07	0.46	HE
12.	Banning of farming on grazing reserves	4.81	4.76	4.72	4.75	0.97	HE
Overall Mean		4.25					HE

Table 3 showed that to a high extent, all the items listed in Table the study are the measures to be taken to prevent farmers-herders conflicts in Adamawa state (grand mean 4.25).

Hypothesis One: There is no significant difference in the mean response of farmers, herders and community leaders on the factors causing Farmers/Herders conflicts in Adamawa State

Table 4: Analysis of Variance [ANOVA] on the Factors Causing Farmers/Herders Conflicts for land use in Adamawa State

	Sum of Squares	Mean Square	Df	F	p	Remark
Between Groups	.563	.282	2	5.474	.004	H_0 Rejected
Within Groups	33.171	.051	645			

Hypothesis Two: There is no significant difference in the mean response of farmers, herders and community leaders on the impact of conflicts on their livelihood in Adamawa State

Table 5: Analysis of Variance [ANOVA] on the Impact of Conflicts on Their Livelihood in Adamawa State

	Sum of Squares	Mean Square	Df	F	P	Remark
Between Groups	.646	.323	2	2.944	.053	H_0 Accepted
Within Groups	70.726	.110	645			

Hypothesis Three: There is no significant difference in the mean response of farmers, herders and community leaders on measures to be taken to prevent Farmers-Herders conflicts in Adamawa State.

Table 6: Analysis of Variance [ANOVA] on the Measures to be taken to Prevent Farmers-Herders Conflicts in Adamawa State

	Sum of Squares	Mean Square	df	F	Sig.	Remark
Between Groups	.585	.292	2	.974	.378	H ₀ Accepted
Within Groups	193.757	.300	645			

The factors causing farmers/herders conflicts in Adamawa state to a high extent include: encroachment of farmers into cattle tracks, inadequate grazing reserves, lack of access to water points, killing of strayed cattle, land tenure system, climate change and corruption by community leaders (with overall mean of 3.67) except cattle theft and irrigation farming. There were significant differences in the mean responses of farmers, herders and community leaders on the factors causing farmers and herders conflicts in Adamawa State. This first finding is in agreement with Babagana, *et al* (2019) who conducted a research on the impacts of Fulani herdsmen-farmers conflicts on crop production in Yobe state, Nigeria. The authors reported that one of the major reasons for the clash between the farmers and herders was lack of grazing fields for herders, indiscriminate bush burning by farmers, crop destruction by encroaching pastoralist, Boko Haram insurgency among others. This finding was also supported the assertion of Aondongu, *et al* (2018) and Ajibefun (2018) who in their separate studies reported that open grazing in Nigeria has caused a lot of problems between farmers who cultivate crops for their personal and commercial purposes and herders who roam about looking for better and green pastures for their herds of cattle, flock and other herbivorous animals with them. The study revealed further that there were significant differences in the mean responses of farmers, herders and community leaders on the factors causing Farmers/Herders conflicts in Adamawa State. This finding is in agreement with Babagana, *et al* (2019) who reported significant difference between the mean responses of farmers and Cattle Herders Association members from their study conducted on the impacts of Fulani herdsmen-farmers conflicts on crop production in Gujba and Tarmuwa Local Government Areas of Yobe state, Nigeria. This result was opposed by Adeoye (2017) who submitted that peace and conflict resolution committee and traditional leaders were unanimous in their opinions on the cause of conflict between farmers and herdsmen in parts of Kano, Yobe and Borno States.

The impact of farmers/herders conflicts on the livelihood of farmers and herders in Adamawa State to a high extent include: loss of crops and livestock, loss of sources of livelihoods, hike in prices of commodities and food stuffs, loss of lives, increased expenditure, destruction of properties, reduction in income and its sources, increased tension in the communities, and destructions of infrastructures (overall mean 3.89). There were no significant differences in the mean responses of farmers, herders and community leaders on the impact of farmers and herders conflicts on their livelihood in Adamawa State. This second finding is in agreement with Amao, *et al* (2018) who investigated effects of herdsmen conflict on productivity of arable crop farmers in Ibarapa Areas of Oyo State, they reported that the invasion of the Fulani pastoralists on farm lands where arable crop was cultivated brought much depression on the farmers as most of the

farmer lost their life savings invested in cultivating the arable crops which led to loss of lives and serious health issues. To further buttress the finding, Chukwuemeka (2018) reported that farmers-nomadic cattle-herders conflict in Delta state has affected the livelihood of both farmers and herders as most farmers are gripped with fear for loss of their investment, while the herders are surrounded with the fear of being attacked by the community members where they graze their cattle and other animals. The study revealed there were no significant differences in the mean responses of farmers, herders and community leaders on the impact of conflicts on their livelihood in Adamawa State. This finding was in agreement with Olu- Adeyemi (2017) who found that, deprivation is not based on wants or needs alone, but on the wants and needs that we feel we ought to have or deserve. More often than not, the Herders are frustrated due to desertification, bush burning; thus, the reality is that they face forced migration and as they migrate, series of challenges are encountered which in turn brings frustration on them and their animals. To further support this finding, Adeleke (2018), Akorede (2018) and Ismaila and Bibi (2015), in their various submissions reported that before the many people engage in farming to either support their earnings or as a means of generating income, initial situation was that every land not cultivated is a potential pastureland but with the expansion in agriculture, it has narrowed down the available pastureland thereby compelling the pastoralists to encroach into farmlands that were not supposed to be theirs; thereby affecting the livelihood of the farmers.

The study also revealed that the measures to be taken to prevent farmers-herders conflicts in Adamawa State to a high extent include: improved land tenure system and land use plan, increased security in farming communities, banning of open grazing in the state, provision of grazing reserves, stopping bush burning, prompt intervention by authorities, dialogue between farmer and herders, punishment for violence perpetrators, and commercialization of farming. This finding is in agreement with Aliyu (2015) who investigated causes of farmer-herder conflicts and the performance of management institutions towards the resolution of the conflicts in Katsina State. Aliyu suggested that the Land Tenure System in use should be revisited with the aim of making it more advanced to meet the needs of the citizenry; and that ranching of animals should be adopted as in advanced countries where cattle are reared and the menace of incessant conflict will be averted. In support of the finding, Alawode (2013) proposed that elderly farmers with many years of experience in resolution of land use conflicts should be brought together to enhance their capacity in resolving land use conflicts among farmers in their villages and farmers should be educated on the need to prevent land use conflicts to enhance production capabilities of the households. The study revealed that there were no significant differences in the mean responses of farmers, herders and community leaders on measures to be taken to prevent Farmers-Herders conflicts in Adamawa State. This finding is in agreement with Kwaja and Bukola (2018) who reported that government overtime have established many agencies with the main aim that the agency is to economically and socially integrate nomadic pastoralists into national life, through the provision of relevant, functional and mobile basic education and livelihood skills training. The finding is also supported by suggestions of Babagana, *et al* (2019) who recommended that, in order to bring an end to the conflicts between herdsmen and farmers, governments at all levels should work out modalities on how to stop crop destruction by establishing cattle tracks and grazing zones where crop farming will be severely restricted and prevent indiscriminate bush burning. Sensitization/advocacy programs on how to maintain cordial relationships between farming communities and herdsmen should be organized by the government and other stakeholders.

Conclusion

Based on the findings of the study, it was concluded that the factors causing farmers/herders conflicts in Adamawa state to a high extent include: encroachment of farmers into cattle tracks, inadequate grazing reserves, lack of access to water points, killing of strayed cattle, land tenure system, climate change and corruption by community leaders. To a high extent, farmer – herder conflict impacts the livelihood of farmers and herders, There were significant differences in the mean responses of farmers, herders and community leaders on the factors causing Farmers/Herders conflicts in Adamawa State; but there were no significant differences in the mean responses of farmers, herders and community leaders on the impact of farmers and herders conflicts on their livelihood and measures to be taken to prevent farmers-herders conflicts in Adamawa State.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Farmers-herders should adhere to their boundaries, land tenure system should be discouraged to reduce land fragmentation, bush burning should be discouraged in the state while trees should be planted state wide to cushion the effects of climate change in the state. Cattle tracks and grazing reserves should be maintained and create new ones to take care of increasing herds. These should reduce farmers-herders conflict in each community.
2. The state and federal governments should intervene through the provision of relief materials to cushion and reduce effects of farmers-herders conflict on livelihood of victims, and also help them rebuild destroyed infrastructures to enable them resettle quickly and resume their normal lives.
3. The establishment/encouraging commercialization of cattle rearing and crop farming across the state, legislations controlling open grazing in the troubled local governments in the study area should be enforced, use of dialogue in dispute resolution should be encouraged by the state government, existing grazing reserves should be revitalized with facilities such as Nomadic schools, health facilities for herders and their livestock, water points *et cetera*.
4. There should be presence of government and other government machineries in all rural communities in terms of security and local policing to curb and spontaneously nab and nab violence perpetrators not until there is escalation of violence before actions are taken.

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