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Analysis of the Economic Impact of Farmer–Herder Conflicts in Selected Local Government Areas of Adamawa State

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Abstract

This study examined the perceived causes and economic effects of farmer–herder conflict, and the potential role of public relations strategies in managing conflict in selected local government areas of Adamawa State, Nigeria. Data was collected through questionnaires, of which 316 of 389 administered were returned, representing an 81.2% response rate. Findings show that 98.7% of respondents agreed or strongly agreed that open grazing contributes to conflict. Respondents identified destruction of crops and animals, including reported losses of 4,529 cattle and 5,650 grains, as major economic effects. Abandoned farmland and restricted grazing were also reported. Support for dialogue-based approaches was high: 88.6% endorsed negotiation, 91.8% conciliation, and 92.4% mediation. Views on whether government efforts to mitigate conflict were adequate were divided. The study concludes that conflict is perceived to disrupt agricultural resources and rural livelihoods, while respondents see dialogue and public relations strategies as useful management options. It recommends inclusive community forums, trained mediators, clear communication of land-use arrangements, and improved reporting of losses. Further research should verify and quantify household-level economic impacts.

Keywords: Farmer–herder conflict, economic effects, open grazing, negotiation, mediation.

Introduction

In the past, the movement of herdsmen was seen as a means of increasing the economy of the country because the income made from the sales of their cattle and other animals had increased the internally generated revenue in the country in general. Today, these herdsmen have been seen as a problem which cannot be easily solved wherever they are found in the country. The need to establish social cohabitation among the herdsmen and their host communities has been threatened because of continuous killing, maiming and destruction of lives and properties.

At this juncture, it has become very imperative to use Public Relations in the management of the conflicts between the Fulani Herdsmen and the farmers in Adamawa State. Public relations will make the Herdsmen to know that they are causing havoc to human existence. It will make them understand that it is morally and constitutionally wrong to attack their host communities rather than compensating them for accommodating them on their land. Public Relations will make the parties understand the need for co-operation and co-existence. It will sensitize them to know that it is not good to be barbaric and wicked in their interaction with their host communities. They will also understand that it is against the law of nature to engage in bloodshed of innocent citizens. Public Relations will help to bring everlasting peace between Herdsmen and the farmer in Adamawa State and Nigeria.

The study will examine the economic impact of farmer herder conflict in Adamawa state with emphasis on Numan, Hong and Madagali local government areas. Dispute generally is a product of economic competion. Disputes at any level arise from divergences of interests, desires, goals and values aspirations in the competition for resources to meet imposing demands on social life in a defined socio-physical environment (Otite, 2001). As a matter of fact, Man in a socio-physical environment lives in continuous process of dependence and interdependence which often produces contradictions and conflicts. Communal disputes constitute one of the major recurring problems bedevilling the socio-political landscape of Nigeria. Communal disputes are not new, particularly in socio-cultural complex societies defined by a high number of ethnic nationalities and language groups.

In Numan local government area, public relations (PR) Department is under the director personnel of the Local Government Council. The department participates in all activities of the local government and influences them. The PR Information officer and Public Enlightenment Sector educate the people on Local Government Polices, Projects, and Activities. Local government exhibitions, rural tours by the council's chairman, press conferences with local press, and designing, printing and circulating of Local Government leaflets are part of the duties of the PRO and his department in the local council. And these are the typical Public Relations tools used.

Public Relations does not only establish and maintain goodwill, mutual understanding and long-lasting relationship between a local government and the public both internal and externally, it plays, also, a vital role in enhancing the growth and development of a local government revenue base. This could be achieved if Public Relations strategies are carefully, effectively and efficiently used in those areas/channels through which a local government generates its revenues. And these includes: Tenement rates, fees from motor parks, and cyclists (Okada riders), Trade permit, liquor licensing, advert (Neon signs, steals, woods), which the fees/prices for them differs and these attract heavy sums of money, Town halls, Reception halls, Market stalls, Street naming, Rentals (Chairs, Toeing Vans, Canopies) Transport scheme, Housing scheme, Issuance of death certificates, Merriments, Abattoir, Town planning, provision of consumers corporative society goods, at subsidized rate, and lot more.

In Hong local government, Adamawa state, there confrontations between inhabitants within communities and across communities and this engender disharmony among some residents culminating in insecurity problems in Adamawa state. The violent conflict between residents in the state have been manifesting in form of bloody clashes (attacks and counter attacks). These bloody attacks and counter attacks have created social or relational implications and economic adverse effects such as loss of human lives, displacement of people from their homes and low rate of socio-economic activities.Hong local government council do not appreciate the need for Public Relations and its programs, let alone prioritizing it. They therefore do not make use of public relations strategies and their programme while carrying out their functions. It is against the foregoing that the study will examine the economic impact of the conflict and the role of public relations as a tool for resolving communal dispute in Nigeria with emphasis on Numan, Hong and Madagali local government area of Adamawa state.

Statement of the Problem

Agriculture remains one of the major sources of livelihood for rural households in Adamawa State, with a large proportion of the population depending on crop farming and livestock rearing for income and food security. However, in recent years, the relationship between farmers and pastoral herders has increasingly been characterized by violent conflicts over access to land, water, and grazing routes.

Competition for these scarce natural resources has intensified due to population growth, climate change, and the expansion of agricultural activities into traditional grazing areas.

The farmer–herder conflict has resulted in serious socio-economic consequences in many communities across Adamawa State. Farmlands and crops are often destroyed by grazing cattle, while retaliatory attacks by farmers have also been reported. These conflicts disrupt agricultural activities, reduce farm productivity, and destroy important factors of production such as land, labour, and infrastructure. Consequently, farmers' incomes decline and the capacity of households to sustain their livelihoods becomes weakened. Furthermore, the persistent insecurity caused by these clashes has forced many farmers to abandon their farms or relocate to safer areas and internally displaced people (IDP) camps. This displacement significantly reduces agricultural output and contributes to food shortages in affected communities. Studies have also shown that farmer–herder conflicts negatively affect food availability and accessibility in Adamawa State, thereby worsening poverty and food insecurity among rural populations. Despite several interventions by government and international organizations aimed at promoting peaceful coexistence between farmers and herders, the conflicts continue to persist in many local government areas of the state. This ongoing situation raises concerns about the sustainability of agricultural production, rural development, and food security in Adamawa State.There has been reported case of conflicts between Herdsmen and farmers arising from open grazing by cattle of Herdsmen. Since then, many damages have been done to human life, agriculture and different forms of human endeavors in Adamawa State and Nigeria at large.

This wanton destruction of lives and property by the farmer/ herdsmen under the guise of retaliation and open grazing has resulted to death tolls of innocent souls of men and women in Adamawa State. Other negative effects of this menace include rape, intimidation, destruction of native vegetation, damage of soils and stream banks, damage of farmlands and agricultural products, contamination of waterways with fecal wastes and a lot more. These constant attacks of Herdsmen have generated serious tensions and conflicts between the herdsmen and the farmers in Adamawa State. This situation has created social insecurity and disunity. The reported cases of this Farmer Herdsmen conflict is nationwide menace, thereby leading to some states of the federation such as Benue, Ekiti, and Taraba state etc have enacted laws against open grazing.

The activities of Herdsmen in Nigeria have attracted both national and international attention and therefore should be seriously checked before it becomes much uncontrollable. The study therefore wants the unearth the magnitude of economic impact in the selected local government areas and the best strategies that could be used to mitigate the scale of the conflict by ensuring peaceful atmosphere and healthy living for all and sundry in the country.

Therefore, the study will painstakingly examine the economic impact of farmer–herder conflict in selected local government areas of Adamawa State, with a view to providing empirical evidence that can guide policy formulation and conflict management strategies.

Aim and Objectives

The broad objective of this study is to examine the economic impact of farmer's herder's conflicts in selected local government areas of Adamawa State. While the specific objectives include:

i. To examine the causes of farmers–herder's conflicts in selected Local Government Areas of Adamawa State.
ii. To assess the economic impact of farmers–herders' conflicts on agricultural production and food securirty in the affected areas.

iii. To evaluate the extent of property damage, loss of livestock and crops resulting from farmers–herders' conflicts.

iv. To identify possible measures for reducing farmers–herders' conflicts and improving addressing farmers–herders' conflicts.

Significance of Studies

The outcome of this study would be used to prevent the incessant attacks on and by herdsmen on their host communities in Adamawa State. It will also be a source of arranging for peaceful cohabitation, prevention of loss of lives and property caused by the herdsmen in Adamawa State. Since it is believed that what we view television on television has tremendous influence on us, the researcher believes that the outcome of this study will be of great advantage to several people. Amongst the benefits and beneficiaries of this study are rural dwellers, governments and other agencies in the country.

The study will contribute to the existing body of knowledge on the relationship between farmers–herders' conflicts and economic development. It will provide empirical evidence on how such conflicts affect agricultural productivity, income levels, and livelihoods in rural communities. Also, the findings of the study will be useful to government and policy makers at the federal, state, and local levels. It will help them understand the economic consequences of these conflicts and assist in designing effective policies and strategies aimed at reducing conflicts and improving agricultural development in Adamawa State and Nigeria as a whole.

Moreover, the study will benefit farmers, herders, and local communities by highlighting the economic losses associated with conflicts and the importance of peaceful coexistence. The recommendations of the study may help promote better conflict resolution mechanisms and cooperation between the two groups.

Furthermore, the research will serve as a reference material for researchers, scholars, and students who may wish to conduct further studies on farmers–herders' conflicts, rural development, agricultural economics, and conflict management.

Hence, the study will assist development agencies and non-governmental organizations (NGOs) working in the areas of peacebuilding, agriculture, and rural development by providing information that can guide interventions aimed at reducing conflicts and improving the economic well-being of rural populations.

Scope and Limitations of the Study

This study will examine the economic impact of fermer herder conflict in selected on some selected local governments area of Adamawa state. Due to lack of adequate funds and time, all the appropriate data could not be collected for the study from all the noises and crannies of the local government. Similarly, time constraints made timely access to information difficult and so, data for the work will be limited to selected LGAs because of the rural nature of the study area, many respondents could not adequately respond to our research questionnaire and interview due to high-level illiteracy and fear of been subjugated to unnecessary embarrassment.

Literature Review

The conflict between crop farmers and pastoral herders has become one of the major security and economic challenges affecting agricultural communities in Nigeria, particularly in the northern region.

Several scholars have examined the causes, nature, and consequences of this conflict on rural livelihoods, agricultural production, and food security.

Farmer–Herder Conflict and Agricultural Production

Studies have shown that farmer–herder conflicts has significantly affected agricultural production in Adamawa State. Research by Silas, Gambo, and Hassan (2023) found that conflicts between crop farmers and pastoralists lead to the destruction of crops, farmland, and other agricultural resources, thereby reducing crop output and farmers' income. Their regression analysis indicated a strong relationship between conflict and reduced farm productivity, with farmers experiencing substantial financial losses due to the destruction of farm produce.

Similarly, Egunsola and colleagues (2024) examined the causes and impacts of farmer–herder conflicts on agricultural production in Adamawa State and reported that the conflict disrupts farming activities, discourages investment in agriculture, and weakens rural economic development. The study also identified land competition and grazing disputes as major factors responsible for the recurring conflicts between farmers and pastoralists.

Impact on Food Security and Livelihoods

Farmer–herder conflicts have also been linked to food insecurity in many communities. Tukur, Bello, and Usman (2024) analyzed the effect of farmer–herder conflict on food availability in Adamawa State and found that the conflict causes significant disruption to food production and distribution. The destruction of crops, displacement of farmers, and disruption of market activities reduce the supply of food and increase the vulnerability of households to food shortages.

In addition, conflicts often force farmers to abandon their farms and relocate to safer areas or internally displaced people (IDP) camps, which further reduces agricultural productivity and food availability. The displacement of rural populations also disrupts economic activities and reduces income opportunities for affected households.

Causes of Farmer–Herder Conflict

Scholars have identified several factors responsible for the increasing farmer–herder conflicts in Adamawa State and other parts of Nigeria. Egede and Ibrahim (2024) found that environmental, social, and economic factors contribute to the conflict. These include population growth, competition over land and water resources, climate change, and the expansion of farming activities into traditional grazing routes.

Another study focusing on the Numan Federation in Adamawa State highlighted land and water scarcity as major triggers of the conflict. The researchers argued that the struggle for access to fertile land and water sources often results in violent clashes between farmers and herders.

Economic Consequences of the Conflict

Beyond agricultural production, farmer–herder conflicts have broader economic implications. Jibrilla and colleagues (2024) observed that these conflicts reduce agricultural productivity, increase food prices, discourage investment in the agricultural sector, and contribute to unemployment and rural poverty. The destruction of property and loss of livestock also weaken the economic stability of rural communities that depend heavily on agriculture for survival.

Overall, the literature shows that farmer–herder conflict has significant negative effects on agricultural productivity, food security, and rural livelihoods in Adamawa State. However, many studies focus mainly on the causes or food security implications of the conflict, leaving limited empirical evidence on the broader economic impact on rural households and agricultural development. This gap highlights the need for further research to comprehensively examine the economic impact of farmer–herder conflicts in Adamawa State.

Concept of Conflict

Although it emerges in various environments and levels, conflict in its general meaning could be defined as a difficulty encountered by an individual or a group in the process of choosing an option and disruption in decision making mechanisms consequently (Nzamane, 2004). In addition to this, although it arises from individual differences in general, conflict may also originate from issues such as codependency of jobs, differences in definitions of jobs, duties and organizational structures. As regards, conflict may also be defined as a dispute between two or more organizational members or groups because of the need to work in positions that require functional codependency and that differ in status, purpose, value or perception (Thomas, 1992). When considered as a process, the substages that may be drawn from the definitions concerning the concept of conflict are listed in the following sequence (Ikpe, 2011):

a. The presence of incompatible or opposite interests between individuals or groups,
b. Diagnosis of these oppositions by the parties involved,
c. The belief by both parties that the other is obstructing and disrupting their interests,
d. Action taken by both parties with the aim of obstructing or disrupting the other’s work.

Wherever there is human factor as a social input, arguments and conflicts among individuals are inevitable because of individual differences especially in today’s environment of intense globalization and competition (Femi, 2017). Everybody may adopt and defend different feelings, thoughts, beliefs, attitudes, preferences, etc. depending on individual differences. These differences are one of the important factors constituting the source of conflicts (Nwosu, 2011). Conflict is a phenomenon that could emerge in every part of organizational life, and it may bring heavy loads and costs both for organization and individuals if it is not managed well. Tyotom (2004).

The term conflict management is more extensive than the term conflict resolution. In other words, conflict resolution expresses reconciliation of conflict while conflict management includes both reconciliation of conflict and directing destructive conflicts towards constructive results. Conflict management may be expressed as a process that involves stages of diagnosing the conflict, determining its intensity, defining appropriate intervention methods through an evaluation of this intensity regarding its effects and monitoring its result (Suleiman, 2006). The success of organization in conflict management is indicative of an organizational structure that enables constructive interaction between individuals and groups. In such organizations, majority of employees consist of individuals who are adequately knowledgeable, experienced and ready to accept different standards of judgment. Individuals show a genuine, honest

and determined attitude to find a solution for the conflict by virtue of trust between the members of organization, by loyalty to the work group and organization and motivation for cooperation. There is a prominent inclination to find a constructive solution rather than carrying on the conflict. The solutions found are often quite creative and are better than the resolution proposed by the conflicting parties (Ejembi, 2018).

Theoretical Framework

The theoretical framework that is adopted for the study is the general system theory because of its suitability and relevance to the objectives of the study, The general system theory also inform our discussion on the economic impact of farmer herder conflicts in Some selected LGAs is the general systems theory, the two-way symmetric model and Melvin Sharpe's behavioural model.

General System Theory

The scholar most associated with this theory is Easton (1965) "sees the political system as a set of interrelated and reciprocally regulated patterns of actions and orientation, pattern that cluster together in equilibrium and that have certain needs of maintenance and survival. It is a phenomenon of whatever type, including physical, biological, social, political, etc., which is an organized whole with identifiable, interrelated structures delineating it from the environment (supra system) in which it is located and with which it interacts, processing the inputs from it into outputs for it.

The general systems theory seeks to argue that every system, including political system, has subsystems which make up the entire system. They are assigned functions and provided with enabling empowerment, including resources, appropriate authority, etc. to enable them to discharge their responsibilities optimally. Where this is the case, there is said to be homeostasis (stability) in the political system. On the other hand, instability reigns in the political system where the contrary is the case and the subsystems and entire system are also unable to function optimally.

Input and output analysis of a political system is very important. A political system is said to obtain its inputs (demands, support, liberty or autonomy, cooperation, criticisms, resources, information, direct labour, etc.) from the environment. These inputs are what the subsystems employ to discharge their responsibilities, so that the political system can send out its outputs into the environment and obtain further inputs for its operations.

Empirical Literature Review

Asemah, and Asogwa (2016) in a study titled Public Relations Strategies and the administration of Jos North Local Governments, Plateau State, Nigeria The study set out to critically examine the place of Public Relations Strategies in the administration of Local Governments s in plateau State, with Jos North Local Governments as an area of study. The study examines the extent to which Public Relations Strategies are used to manage the Local Governments, which have been riddled with one form of crisis or the other, in the last ten years. In addition, the paper examines the factors which impede effective practice of Public Relations Strategies in Jos North Local Governments and, the Public Relations Strategies that can be used to effectively manage the crisis in Jos. The survey research method was adopted, and the questionnaire was used as instrument of data collection. One hundred (100) copies of questionnaire were administered to the sampled population. Findings show that, although the Local Governments endeavors to inform the people about their policies and programmes, the information provided is done on an occasional basis. Findings show that there is a general dissatisfaction with Public

Relations Strategies practice in Jos North Local Governments. Based on the findings, the paper concludes that the extent to which Jos North Local Governments recognizes and makes use of Public Relations Strategies is little. Based on the findings and conclusion, the study, among others recommended that, Local Governments in Nigeria should evolve Public Relations Strategies policies, which will serve as guides towards their attainment of Public Relations Strategies objectives

Silas, Gambo, and Hassan (2023), “Effect of Crop Farmers–Pastoralist Conflict on Crop Output in Adamawa State, Nigeria.” Surveyed 192 crop farmers in 24 communities across eight conflict-prone LGAs, using descriptive statistics and multiple regression. It reports a negative relationship between conflict and crop output/income, including losses of about ₦87,875,000 in farm produce. Loss of crops, displacement, deaths in the family, and reduced farm size were linked to lower output.

Egunsola, Mberekpe, and Ferdinand (2024), “Causes, Preventive Strategies and Impacts of Conflicts between Crop Farmers and Herders on Agricultural Production in Adamawa State, Nigeria.” Surveyed 384 farmers, herders, and community leaders. Respondents reported livelihood and agricultural impacts; the study used mean scores and ANOVA. It is useful for understanding perceived effects and comparing the views of different groups, though it does not estimate monetary losses.

Tukur et al. (2024), “An Empirical Analysis of the Effect of Farmer-Herder Conflicts on Food Availability in Adamawa State.” Uses survey responses and chi-square analysis. It links conflict with crop damage, lower productive capacity, disrupted markets and infrastructure, reduced farm output and income, and displacement. This helps broaden the economic discussion beyond farm production alone.

Yahya, Ali, and Jibrilla (2026), “Effects of Farmer-Herder Conflicts on Food Security among Farming Households in Adamawa State, Nigeria.” Use a cross-sectional household survey, food-security index, and logistic regression. The study reports that about 63% of sampled households were food insecure, and that cattle rustling, violent confrontations, crop damage, and interpersonal clashes reduced the likelihood of household food security.

Yahya and Ahmed (2021), “Causes and Effects of Conflicts between Cattle Herders and Crop Farmers in Girei, Adamawa State, Nigeria.” Based on questionnaires and chi-square analysis, it identifies crop damage and lawlessness as key causes, and reports losses of expected yield, cattle, lives, and property.

Bulus and Wizor (2020), “Spatial Analysis of the Impacts of Crop Farmers and Cattle Herders Conflicts on Community Development in Adamawa State, Nigeria.” Surveyed 126 respondents across three LGAs, supplemented by interviews and focus groups. Reported impacts include reduced household income, less access to agricultural land, and damaged infrastructure.

Sadiq et al. (2021), “Impact of Farmers-Herders Conflict on Livelihoods of Farming Households in Nigeria’s Middle-Belt Region.” Using survey data from 290 households, the authors applied propensity-score matching and regression adjustment. They estimate that highly affected households had lower farm and total incomes than less affected households. It offers a stronger comparison of income outcomes, but its study area is not Adamawa, so use it as supporting evidence rather than an Adamawa-specific result.

Mercy Corps (2015), “The Economic Costs of Conflict and the Benefits of Peace.” Examines economic effects in Benue, Kaduna, Nasarawa, and Plateau, using household survey evidence and state revenue data. It is useful for framing wider economic channels and the value of peace, but it does not study Adamawa.

Hence, related empirical studies in Adamawa State generally find that farmer–herder conflict is associated with reduced agricultural production and weaker household economic welfare. Silas, Gambo, and Hassan (2023), drawing on a survey of crop farmers across eight conflict-prone LGAs, report lower crop output and income associated with crop losses, displacement, deaths in households, and reductions in cultivated farm size. Other Adamawa studies connect conflict with damaged infrastructure, disrupted markets, reduced access to farmland, and lower food availability. Recent household-level evidence also links conflict exposure to food insecurity. Together, these findings suggest several pathways through which conflict affects the local economy: direct destruction of crops and livestock, reduced access to land and labour, displacement, and interruption of trade and production.

Methodology

This section includes the study design, techniques, and models used for estimating the specified objective. Data sources, measurement, and descriptive statistics for the objective already defined are also presented and discussed accordingly to find policy implications in the subsequent section. Also, before starting the techniques and model that were used for estimating the objective of the study, the model adopted for the primary investigation is also stated. Moreover, this section gives a brief definition and explanation of some concepts that are useful in understanding the result of the analysis. In this regard, the study considered the use of Survey research design for the study. It is an investigation in which sample of the population is selected such that the sample is representative of the whole population. Information gather must be able to be generalized to the whole population and thus survey research is useful for development and planning purpose.

Research Design

Survey research design is used for the study. It is an investigation in which sample of the population is selected such that the sample is representative of the whole population. Information gathered must be able to be generalized to the whole population and thus survey research is useful for development and planning purposes.

Sampling Techniques

Systematic sampling will be used for the study. It is a statistical method involving the selection of elements from an ordered sampling frame. The sampling starts by selecting an element from the list at random and then every element in the frame is selected. Using this procedure each element in the population has a known and equal probability of selection.

Population of the Study

The three, (3) selected LGAs of Adamawa State namely, Numan, Hong and Madagali has a projected population of 260,312 (National Population Census, 2006) but the study examines the perception of the staff of three Local Governments staff on the Economic impact framer herder conflict and the role of Public Relations Strategies in mitigating the conflict in the selected Local Governments areas. The staff of the selected LGAs of Adamawa State has form the population of the study. The three selected Local Governments Areas have staff strength of approximately one thousand five hundred (1500). This forms the population of the study and simple random method of sampling has been adopted in the selection of the three (3) Local Government Areas

Sample Size

In determining the sample size for the study, Yamani (1964) formula for determining sample size for study will be used. The estimated population of the three selected LGAs staff is 1500.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

a. n = Sample size
b. N = Population size
c. e = Level of precision (sampling error), usually 0.05 for 95% confidence level

Given:

a. N = 1500
b. e = 0.05
c. Step 1: Substitute into the formula

$$n = \frac{1500}{1 + 1500(0.05)^2}$$

d. Step 2: Solve

$$0.05^2 = 0.0025 1500 \times 0.0025 = 3.751 + 3.75 = 4.75 n = \frac{1500}{4.75} n = 315.79$$

e. Final Sample Size

$$n \approx 316$$

In determining the sample size for the study, the Yamane (1967) formula for sample size determination was adopted. The population of staff in the three selected Local Government Area is 1,500. Using a 5% level of precision, the sample size was determined as follows:

$$n = \frac{N}{1 + N(e)^2}$$ Substituting the

values: $$n = \frac{1500}{1 + 1500(0.05)^2} = 316.$$

Therefore, the sample size for the study is 316 respondents.

Sources of Data and Methods Analysis

Primary and secondary data that was used for the study. The primary source of data consists of the questionnaire administered to the respondents, key performance interview (KPI) and Focal Group Discussion (FGD) while the secondary source of data was collected from textbooks, journals article and the internet. The questionnaire adopted for the study was structured type with close-ended questions.

The data collected for the study are hereby presented below. Out of 389 questionnaires distributed 318, that is 84% were returned and used in the data presentation The data is systematically organized, arranged and presented in such a manner that they provide answers to the research problems. The data collected were subjected to statistical manipulation using the frequency distribution system in tables and simple percentage. Chi-square (x2) was further used for the test of hypotheses. The test of hypotheses necessitated the use of Chi-square (x2) as earlier stated.

The Chi–Square (χ^2) formula used in hypothesis testing is written as:

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$ Where:

- χ^2 = Chi–square calculated value
- Σ = Summation sign (add all values)
- f_o = Observed frequency
- f_e = Expected frequency
- Degree of Freedom (DF)

The degree of freedom for Chi-square is calculated as: $DF = (r - 1)(c - 1)$
Where:

- r = number of rows
- c = number of columns

Data Presentation, Analysis and Interpretation

Under this section, results are presented out of the data analysis carried out on the dataset collected from the field using the research instrument (i.e. the questionnaire). First, summary of statistics on the respondents' demographic biodata, describing same using frequencies and percentages depicting their distribution within the sample taken are presented. The estimate of the reliability index for the research instrument using the Cronbach's alpha index is shown and the rates of return of the administered questionnaire by the respondents were discussed. Similarly, some inferential statistics were presented based on the research questions and the study hypotheses; discussions of findings are made and then some inferences and conclusions are drawn relative to the study outcomes.

Table; 1: Rates of returned by the three selected LGA of Adamawa State

Rate of Returns

S/N	Local Governments Areas	Respondents
1	Numan	124
2	Hong	98
3	Madagali	94
	Total	316

Source: Field Survey 2026

Overall, out of the three hundred and eighty-nine (389) questionnaires administered to the study area, a total of three hundred and sixteen (316) questionnaires were duly filled and returned, which makes up an 81% return rate out of the total and a 19% (73) non-response rate. The table shows the return rate per Local Governments are with Hong Local Governments having the highest with 94.9% return rate, while Numan Local Governments have the least with 87.7% return rate. This turnout is largely aided using trained research assistants who ensured a high retrieval of the filled questionnaires as indicated in table 1:

Table 2: Administration of Instrument to Respondents in three (3) LGA in Adamawa State

S\N	LGA	SP	RR	% RR
1	Numan	150	124	82.7
2	Hong	120	98	81.7
3	Madagali	119	94	79.0
	Total	389	316	81.2

Source: Researcher, 2026

Note Key: SP = Sampled Population RR = Rate of Return

Presentation of the Results of Study

Chi-square Result on Administration of Questionnaires in Table 2b

Table 2b Expected returns

LGA	Observed returned \(f_o\)	Expected returned \(f_e\)	\(\frac{(f_o-f_e)^2}{f_e}\)
Numan	124	121.85	0.038
Hong	98	97.50	0.003
Madagali	94	96.65	0.073
Total	316	316.00	0.114

Source: Researcher, 2026

At the 5% significance level, the critical value for \(df=2\) is 5.991. Since \(0.114 < 5.991\), the result is not statistically significant (\(p\approx 0.945\)). We fail to reject the null hypothesis that the questionnaire return rate was the same across the three LGAs.

However, the result therefore suggests that the differences in return rates among Numan, Hong, and Madagali are small and could reasonably be due to chance under the equal-return-rate assumption. This analysis tests whether return rates differed by LGA; it does not test the economic effects of farmer–herder conflict.

Here are results presented to address the various research study objectives along with the discussion of findings from the respective data analysis

Table 3: Is Open grazing the cause of farmer-herder conflict?

Respondents	Frequency	Percentages
SA	203	64.2%,
A	109	34.5%
U	0	0%
D	003	0.9%
SD	001	0.3%
Total	316	100%

Source: Field Survey 2026

The table: 3 reveals that 203 respondents with 64% percent, strongly agreed that open gracing is the cause of farmer-herder conflict, while 34% percent making 109 respondents agreed that open gracing is the cause of farmer-herder conflict in their area and only negligible percentages of 0.9% and 0.3% of the respondents disagreed and strongly disagreed to the Statement if open gracing is the cause of farmer-herder conflict in their area.

Goodness-of-fit chi-square test with the null hypothesis assumption that responses are equally distributed across the five categories, the expected frequency is shown on table 3a.

Table 3a \[f_e=\frac{316}{5}=63.2 \]\[\chi^2=\sum\frac{(f_o-f_e)^2}{f_e} \]

Response	Observed \(f_o\)	Expected \(f_e\)	\(\frac{(f_o-f_e)^2}{f_e}\)
SA	203	63.2	309.35
A	109	63.2	33.19
U	0	63.2	63.20
D	3	63.2	57.45
SD	1	63.2	61.30
Total	316	316	524.49

Source: Researcher, 2026

\[df=k-1=5-1=4 \]

At the 5% significance level, the critical value for \(df=4\) is 9.488. Since \(\chi^2=524.49\) is greater than 9.488, the result is statistically significant (\(p<0.001\)). The responses are not equally distributed; they are concentrated in “Strongly Agree” and “Agree.” 312 of 316 respondents (98.7%) agreed or strongly agreed that open grazing is a cause of farmer–herder conflict. The table therefore shows very strong respondent agreement with that statement.

This result depends on the equal-frequency assumption. If your intended null hypothesis is a different distribution, for example, that agreement and disagreement are equally likely—the expected frequencies must be recalculated for that hypothesis. Also, the listed percentages need correction: the frequencies imply 64.2% SA, 34.5% A, 0% U, 0.9% D, and 0.3% SD (rounded to one decimal place).

Table 4: The Economic Impact of farmer herder conflict on food Security

Respondents	Frequency	Percentages
Wanton destruction of Animal and Crops	226	71.5%
Abandoned farmland & Restricted Grazing	90	28.5%
Protection of lives and crops	0	0%
Total	316	100%

Source: Field data 2026

The table 4 shows that most respondents, 226 (71.5%), identified the wanton destruction of animals and crops as the main economic impact of farmer–herder conflict on food security. A further 90 respondents (28.5%) identified abandoned farmland and restricted grazing. No respondents selected protection of lives and crops.

The findings suggest that respondents mainly associate the conflict with damage to agricultural resources and reduced access to farmland and grazing areas. These effects can disrupt food production and threaten the livelihoods of farming and pastoral communities.

Table 5: Extent of Property Damage and Loss of Livestock and Crops Resulting from the Conflicts

Respondents	Frequency	Percentage	Cattle rustled (head)	Grains lost (tonnes)
Wanton destruction of animals and crops	226	71.5%	4,529	5,650
Abandoned farmland and restricted grazing	90	28.5%	—	—
Protection of lives and crops	0	0.0%	—	—
Total	316	100.0%	4,529	5,650

Source: Field data, 2026.

Table 5 indicates that property damage and agricultural losses were substantial. Most respondents, 226 (71.5%), identified the wanton destruction of animals and crops as an effect of the conflicts. The reported losses associated with this category were 4,529 cattle rustled and 5,650 tonnes of grains lost. A further 90 respondents (28.5%) identified abandoned farmland and restricted grazing, which may reduce food production and limit access to livelihoods. No respondents selected protection of lives and crops.

Overall, the findings suggest that the conflicts caused considerable losses of livestock and grain, alongside disruption to farmland and grazing. However, the table does not show how the reported cattle and grain losses were distributed among respondents. The figures are therefore best presented as reported totals, rather than assuming they were each reported by all 226 respondents.

Table 6 Governments make adequate efforts to mitigate the recurring of the conflicts?

Respondents	Frequency	Percentages
Govt. made adequate effort	165	52.22%
Govt. did not make effort	146	46.20%
No idea	05	1.58%
Total	316	100%

Source: Field data 2026

Table 6 shows that 165 respondents agreed that Governments make adequate efforts to mitigate the recurring of the conflicts between the farmers-Herders in their area while 146 which makes 46.20% says Governments didn't make efforts to mitigate the recurring of the conflicts and only 5/1.58% says they don't have any idea about the Statement, the implication here was no intensive awareness of the Governments making adequate efforts to mitigate the recurring of the conflicts between the farmers-Herders in their area, because almost half of the respondents are not aware if such happened.

Table 7: The Role of Public Relations Strategies can be used in resolving conflict in some selected LGAs of Adamawa State?

Respondents	Frequency	Percentages
SA	202	63.9%
A	110	34.8%

U	0	0%
D	003	0.9%
SD	001	0.3%
Total	316	100%

Source: Field data 2026

Data presented from table 7indicate that 312 respondents representing 98.8% were of the opinion that open Public Relations Strategies can be used to solve conflicts between the Herdsmen and the farmers in Adamawa State. However, 4 respondents representing 1.2% had contrary view.

Table 8: Negotiation is used in managing farmers/herder conflict?

Respondents	Frequency	Percentages
SA	205	64.8%
A	075	23.7%
D	020	6.3%
SD	016	5.1%
Total	316	100%

Source: Field data 2026

The table 8 indicates, strongly agreed to the assertion that Negotiation be used in managing farmers/herder conflict with frequency of 205 and 64.8%, 75 respondents making 23% agreed that Negotiation be used in managing farmers/herder conflict, while 20 respondents making 6.3% and 16 respondents with 5.1% percent disagreed and strongly disagreed respectively to the Statement that Negotiation can be used in managing farmer/herder conflict

Table 9: Is conciliation an option in managing farmers/herder conflict?

Respondents	Frequency	Percentages
SA	225	71%
A	065	21%
U	0	0%
D	015	5%
SD	011	3%
Total	316	100%

Source: Field data 2026

The table 9, indicates, strongly agreed to the assertion that conciliation be used in managing farmers/herder conflict with frequency of 225 and 71%, 65 respondents making 21% agreed that conciliation be used in managing farmers/herder conflict, while 15 respondents making 5% and 11 respondents with 3% percent disagreed and strongly disagreed respectively to the Statement that conciliation can be used in managing farmer/herder conflict

Table 10: Mediation as an option for managing farmers/herder conflict?

Respondents	Frequency	Percentages
SA	198	63%
A	094	30%
U	0	0%
D	013	4%
SD	011	3%
Total	316	100%

Source: Field data 2026

The Table 10: above indicates, strongly agreed to the assertion that Mediation be used in managing farmers/herder conflict with frequency of 198 and 63%, 94 respondents making 30% agreed that Mediation be used in managing farmers/herder conflict, while 13 respondents making 4% and 11 respondents with 3% percent disagreed and strongly disagreed respectively to the Statement that Mediation can be used in managing farmer/herder conflict

Summary

This study examined respondents' views on the causes and economic effects of farmer–herder conflict, and on the potential role of public relations and conflict-management strategies in selected local government areas of Adamawa State. Of the 389 questionnaires administered, 316 were returned, giving an overall response rate of 81.2%. The chi-square test reported for questionnaire returns found no statistically significant difference in return rates across the three LGAs, $\chi^2(2)=0.114,\ p\approx0.945$.

On the perceived causes of conflict, 312 respondents (98.7%) either strongly agreed or agreed that open grazing contributes to farmer–herder conflict. Four respondents (1.3%) disagreed or strongly disagreed. This indicates strong agreement among the surveyed respondents, though the result reflects their perceptions rather than establishing open grazing as the sole cause of conflict.

Respondents identified destruction of animals and crops as a major economic effect associated with the conflict. In Table 5, reported losses totalled 4,529 cattle rustled and 5,650 tonnes of grain lost. A further 90 respondents (28.5%) identified abandoned farmland and restricted grazing as an impact. These reported losses and disruptions suggest pressure on agricultural production and the livelihoods that depend on crops and livestock.

Respondents also expressed support for dialogue-based approaches to conflict management. In Table 6, 280 respondents (88.6%) considered the application of public relations strategies capable of promoting peace. In Table 8, 312 (98.7%) agreed or strongly agreed that public relations strategies could help resolve conflict. Support was also high for negotiation (280 respondents, 88.6%), conciliation (290, 91.8%), and mediation (292, 92.4%).

Views on government efforts were more divided. While 165 respondents (52.2%) said government had made adequate efforts to mitigate recurring conflict, 146 (46.2%) disagreed and five (1.6%) had no opinion. This near-even split suggests that respondents did not share a clear consensus about the adequacy of the government's response.

Conclusion

The findings show that respondents in the selected Adamawa State LGAs perceive farmer–herder conflict as a serious threat to agricultural resources and rural livelihoods. Open grazing was widely identified as a contributing factor, while reported crop and livestock losses, together with abandoned farmland and restricted grazing, point to disruption of both crop and livestock activities.

The findings also show strong respondent support for public relations and dialogue-based approaches, including negotiation, conciliation, and mediation. These approaches may help communities communicate, address grievances, and resolve disputes. However, the survey measures respondents' views and does not establish that any one strategy will produce lasting peace. The divided assessment of government efforts further indicates a need for clear, consistent, and trusted conflict-management measures.

Recommendations

i. Strengthen dialogue between farming and herding communities. Local authorities and community leaders should support regular, inclusive forums where farmers, herders, traditional leaders, and other relevant groups can raise concerns and agree on practical ways to prevent disputes.

ii. Use negotiation, conciliation, and mediation in local conflict management. These approaches should be conducted by trained and impartial facilitators, with procedures for recording agreements and following up on whether they are respected.

iii. Clarify and communicate rules on grazing and access to farmland. Relevant authorities and community representatives should make land-use arrangements, grazing routes, water access, and seasonal movement rules clear to affected communities, and ensure that these arrangements are communicated in locally understood languages.

iv. Improve reporting and response to crop and livestock losses. A transparent process for reporting, verifying, and addressing incidents could help reduce unresolved grievances and support timely responses to damage and losses.

v. Strengthen coordination among government agencies and community institutions. State and local authorities should work with traditional institutions and community representatives to improve early communication, response to reported incidents, and public awareness of conflict-prevention measures.

vi. Collect more detailed evidence on economic losses. Future studies should record how cattle and grain losses are distributed across respondents, the value of reported losses, changes in farm production and income, and differences across LGAs. This would support a more precise assessment of the economic effects of conflict.

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