Assessment of Causes and Effects of Farmers-Herdsmen Clashes in Taraba State, Nigeria

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Abstract

This study assessed the causes and effects of clashes between farmers and herdsmen in Taraba State, Nigeria. A total of 236 respondents, (120 farmers) and (116 herders) were selected through purposive and multi-stage random sampling methods respectively. Descriptive statistics and logistics regression model were used in the analysis of data. The findings revealed that nine variables were identified as causes of clashes between herdsmen and farmers in Taraba State, out of which eight were statistically significant at 0.05% level of significance. The findings of the study also revealed that land encroachment on cattle routes, crops damage by animals, inadequate grazing reserves, lack of access to water points, killing of stray animals, indiscriminate bush burning, perceived hatred and change in climatic conditions with the exception of pollution of water points were found to be positively significant at 5% level of significance. This signifies that increase in the variables would lead to increase of clashes between them. The study also indicates that five variables that were significant at 5% level of significance were the factors responsible for the causes of the clashes/conflict in the study area. These are land encroachment on cattle routes, crop damage by cattle, inadequate grazing reserves, lack of access to water and indiscriminate bush burning. Avoidance of these causative factors will enhance cordial relationship between farmers and herdsmen and minimize conflicts in future in the study area.

Keywords: Farmers-herders clash, conflicts, transhumance, land encroachment, grazing areas.

Introduction

The occurrences of different types of conflicts are not new phenomena to Nigeria and the West African region at large (Blench 2010; Abbas 2012; Okeke, 2014). In the period before the beginning of 20th century, the problem was mainly restricted to the savanna belts of West Africa. Cattle rearing was mainly prevalent in the Guinea, Sudan and Sahel savanna belts respectively, where crop production was carried out only during the short rainy seasons on a small scale. As time went on, and with the introduction of irrigation farming in the savanna belt of Nigeria and the increased withering of pasture during the dry season, less pasture was available to cattle herders. The herdsmen had to move southward to the coastal zone where the rainy season is longer and the soil retains moisture for a very long period of time, in search of pasture and water – a movement called transhumance (Nyong, 2010).

The large number of wild animals and the fear of losing animals to diseases, especially trypanosomiasis prevented herders from settling permanently in the humid zone (Blench, 2010). Implication of conflicts resulted into insecurity, displacement, disability and death, poor food production, widespread hunger and malnutrition amongst the inhabitants of the said area. Olaniyan *et al.* (2015) opined that there has been an increasing number of conflicts in Nigeria in recent times which are linked to the farmer-herder clashes that include the southward movement of pastoral herds into the humid and sub-humid zones, promoted by the successful control of the menace posed by disease, the widespread availability of veterinary medicine and the expansion of farming activities into areas that hitherto served as pasture land. He further suggested that since the 1950s there has been a growth in

human as well as livestock population in the coastal countries of West Africa which are massively spread over many countries and are found mainly in West Africa and Northern parts of Central Africa, and also in Sudan and Egypt. The human population constitutes the main Fulani sub-groups in Nigeria which are: Fulbe Adamawa (extends from Adamawa to some part of Cameroon republic); Fulbe Mbororo (found all over the West Africa region and extends to Senegal republic); Fulbe Sokoto (found within and around the Sokoto Caliphate, usually referred to as *Sulubawa*); Fulbe Gombe (found in between Bauchi and Gombe regions of Nigeria); and the Fulbe Borgu (found in Kogi and Kwara States of Nigeria).

Farmers-herdsmen clashes have increased tremendously in recent times in Nigeria, especially in the North-Central geo-political zone and Southern zones of the country. The causes of the conflicts have been traceable to the policy gaps and underdevelopment of grazing lands, land ownership and utilization, increase in production due to the increase in populations, climatic changes, induced competition for resources, and other environmental factors. These causes by implication resulting in internal displacement, loss of life and properties, hunger and insecurity destruction of farm crops, cattle rustling and killing of cows (Fasona *et al.,* 2016).

However, the Nigerian government has made several attempts to mitigate this problem from the root in several parts of the country, but the government's response to the violence revolves in the use of military force and mediation by eminent persons at a crisis point. Neither the military nor mediation panels have been able to address the conflicts satisfactorily. In most cases where military forces are deployed to curtail the violence, it aggravates the incidence especially in the treatment of the civil population which itself has become a critical political and security challenges (Hoffman, 2014). These efforts have failed as clashes have continued unabated over the years. Incessant farmers-herdsmen conflicts in Nigeria have claimed many lives and properties (Adeoye, 2017).

Writing on the causes of herders-farmers conflicts Olayoku, (2016) identified climate changes, the migration further south, the growth of agro-pastoralists, the expansion of farming on pastures, the invasion of farmlands by cattle, assault on non-Fulani women by herders, blockage of stock routes and water points, freshwater scarcity, burning of rangelands, cattle theft, inadequate animal health care and disease control, overgrazing on fallow lands, defecation on streams and roads by cattle, effective sedentarization, ineffective coping strategies, ethnic stereotyping, and the breakdown of conflict intervention mechanisms as some of the causes of clashes between farmers-herders. Abbas (2012), suggested that the major source of tensions between pastoralists and farmers is basically economic, with land related issues accounting for the majority of the conflicts.

Blench (2010), attributed these conflicts to the decimation of pastures and the destruction of farmlands by the herders occasioned by seasonal weather conditions which forces pastoralists to move from the semi-arid areas in search of pasture further south, which results in competition over access to available land for crop cultivation and grazing pastures for the cattle.

The contention for arable land as means of livelihood, and for occupational practices pitches the herdsmen and farmers in long-drawn conflicts, especially as herdsmen cling to traditional open grazing practice. For instance, in reference to the bloody crisis between the Mambilla community and Fulani herdsmen in Sarduana Local Government Area (LGA) of Taraba State in June 2017, in which about 200 people were reportedly killed, the then Governor Ishaku, attributed the crisis to land dispute (Njoku, 2018). Taraba State due to its weather and climatic conditions and landscape scenery, promotes cattle and livestock production in earnest, thus herders-farmers clash was witnessed in the past and till recent times, which has culminated to loss of lives and properties. The task at hand is to examine the socioeconomic characteristics of the herders and farmers in the study and to determine the remote and immediate causes responsible for the conflicts, hence

this study will assess the socioeconomic variables of herders-farmers and determine causes and effects of clashes between them in the State. Plethora of work has been carried out by various authors (Olawole *et al.,* 2018; Olabatoke and Omowumi, 2017; Shehu, 2018; Kolawole *et al.,* 2018; Ibe *et al.,* 2017; Njoku, 2018; Kwagha *et al.,* 2018; Ahmed-Gamgun, 2018; Anthony, 2014; and Kwaja and Ademola-Adelehin, 2018) on herders-farmers clashes nationally, but few literature exist of such in case of Taraba State which is a hotspot for such crisis. It is based on these that this study ensued.

Materials and Methods
Study Area
The study was carried out in Taraba State North-Eastern part of Nigeria. It lies between latitudes $6^{\circ}30'N$ and $8^{\circ}40'N$ of the equator and between longitudes $9^{\circ}00'E$ and $12^{\circ}00'E$ of the Greenwich meridian. The State shares boundaries with Bauchi and Gombe States in the north, Adamawa State in the east, and the Cameroon Republic in the South. The State is bounded along its western side by Plateau, Nasarawa and Benue States respectively (Oruonye and Abbas, 2011).

Taraba State has a land area of 60.291 km^2 with a population of about 2.5 million people (National population Census, 2006). Taraba State was created in August, 27th 1991 carved out of the defunct Gongola State. The State derives its name from River Taraba and it is made up of sixteen (16) Local Governments Areas (LGAs) which constitutes: Jalingo, Zing, Yorro, Karim Lamido, Lau, Suntani, Lau, Bali, Mutum Biyu, Ussa, Takum, Donga, Ibi, Wukari, Baissa, Gembu, and Serti. There are two (2) Special Development Areas (SDAs) Yangtu and Ngada. These areas constitute administrative units in three geographical zones as shown in Fig 1 Map of Taraba State. Taraba State is characterized by tropical climate, with distinct dry and wet seasons. The wet season last on the average from April to October with mean annual rainfall that varies between 1,058 mm in the north around Jalingo and Zing, to over 1,300 mm in the south around Serti and Takum. The wettest months are August and September. The dry season lasts from November to March; the driest months are

December and January with relative humidity dropping to about 15 percent, mean annual temperature around Jalingo is about $28^{\circ}C$ with maximum temperature varying between $30^{\circ}C$ and $39.4^{\circ}C$ and minimum temperatures ranges between $15^{\circ}C$ to $23^{\circ}C$.

The Mambilla Plateau has climate characteristics typical of a temperate climate. Temperatures are low throughout the year and the rainy season last from February to November with a mean annual rainfall of over 1850 mm. The dry seasons reaches its peaks in January and February when the dusty north-east trade winds blow across the State. The climatic, soil and hydrology of the State provide a conducive atmosphere for the cultivation of most staple food crops, grassland for animals and fresh water for fishing as well as forestry. Rainfall distribution and topography are the most important factors influencing the pattern of vegetation in Taraba State. The vegetation may be classified into three broad types; the Northern Guinea, the Southern Guinea and the Mountain grassland and Forest vegetation.

The boundary between the Northern Guinea and Southern Guinea corresponds fairly closely with the 1,400 mm mean annual rainfall isohyet, while the Mountain Forest and grassland vegetation occur mainly on the Mambilla Plateau. Most of the lowland areas is made up of ferruginous tropical soils which developed on crystalline acids rocks and sandy parent materials. The upland areas, especially the Mambilla Plateau, are covered by humic Ferrosols and lithosols which are highly weathered and markedly lateritised due to leaching. The State is also a tourist haven in the country. The famous Mambilla Plateau with its beautiful landscape characterized by valleys and waterfalls and its lush green vegetation makes the State a potential pace-setter in the field of tourism in the country. The Gashaka-Gumti National Park located in Serti at the foot of the Mambilla Plateau is another major outstanding tourist landmark in the State. It is not the largest of the eight National Parks in the country, but it is the most diverse in terms of species in the whole of West Africa, habouring such rare animals like the Colobus monkey and Warthogs, including Buffalo, Roam antelope, Chimpanzee,

Hippopotamus, Hyena, Giant forest hog, Lion and Leopard (Oruonye and Abbas, 2011). Taraba State is one of the Nigerian States with the most diverse ethnic groups comprising over 80 ethnic groups.
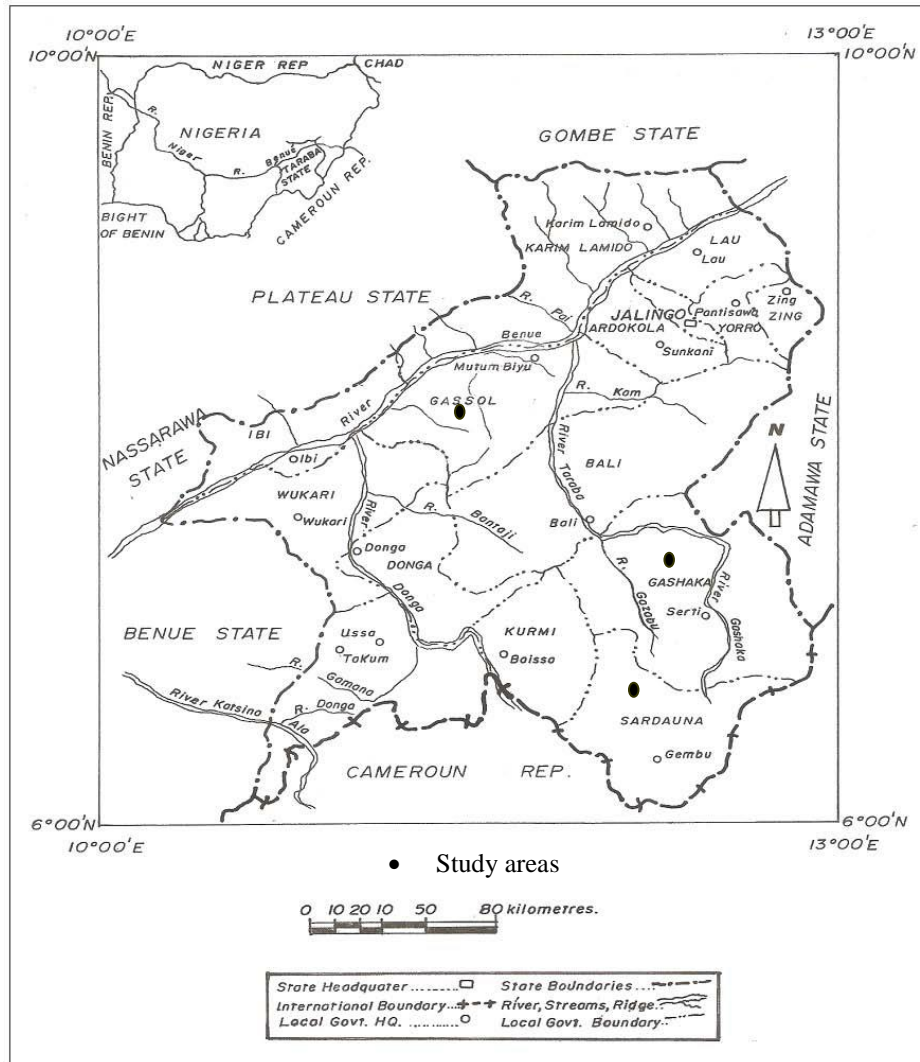

Figure 1: Map of Taraba State showing the study areas

Sampling procedure and sample size

A multi stage and purposive sampling techniques were employed for the study. In stage 1, three Local Government Areas (LGAs) Gassol, Gashaka and Sardauna were purposely selected for the study because they are areas prone to farmers-herders conflicts. In Stage II, purposive sampling of ten (10) farming communities and seven (7) herders settlement in Gassol LGA, fourteen (14) farming communities and six (6) herders settlement in Gashaka LGA, and eleven (11) farming communities and ten (10) herders settlement in Sardauna LGA were selected resulting to a total of thirty-five (35) farming communities and twenty-three (23) herders settlements respectively. The reason for choosing these areas was because they are predominant conflicts/crisis areas between farmers and herders in the State over the years. A total of 1,200 farmer's household heads and 1,160 herder's household heads were selected as the population for the study. In stage

4

III, simple random sampling was used to select 10% of farmers and herders household heads proportionately from the total population which gave a total of (120) farmers and (116) herders household heads as sample size of the study (Table 1).

Table 1; Distribution of selection based on population and sample size of the study

Study area	LGA's selected	Names of communities affected	Number of farmers selected	Number of herders selected	Sample size (10%) Farmers	Sample size (10%) Herders
Taraba State	Gassol	Buba-Liman	40		4	
		Garin-Abba		40		4
		Ali-Yola		10		1
		Iware	30		3	
		Tukurwa		30		3
		Lamlami	20		2	
		Garin-Mu'azu	30		3	
		Sarkin –Shira	80		8	
		Jauro-Manu		40		4
		Barjangan Makurna	30		3	
		Garin-Jibir		50		5
		Garin-Tukura	10		1	
		Barjanga	30		3	
		Chul		40		4
		Gunduma	50		5	
		Garin-Gidado		20	2	
		Garin-Yayani	20		2	
	Gashaka	Kwano	20		2	
		Gashaka	30		3	
		Nyumti	30		3	
		Mayo-Nyim	50		5	
		Karamti	30		3	
		Tounga	50		5	
		Goje	70		7	
		Mayo-Sabere	40		4	
		Garin-Tiv	30		3	
		Gangumi	30		3	
		Duna	30		3	
		Afingi	40		4	
		Kwagri	50		5	
		Kwar	30		3	
		Barmani	60		6	
		Garbabi	50		5	
		Jauro-Jalo	40		4	
		Kabarin-Bature	40		4	
		Shinsham	20		2	
		Bashishir	50		5	
	Sardauna	Tamnya	20		2	
		Kabri	30		3	
		Dorofi	60		6	
		Jabu	20		2	
		Hainare	80		8	

		Vakude	20		2	
		Tangana	60		6	
		Kuma	30		3	
		Kila	50		5	
		Mayo-Ndaga	120		12	
		Tunga-Shu'aibu	40		4	
		Tunga-Luggere	50		5	
		Mbaso	70		7	
		Pertade	50		5	
		Kakara	20		2	
		Kusuku	40		4	
		Yerimaru	110		11	
		Dunda	40		4	
		Sabon-Gari	20		2	
		Kachalla-sa	40		4	
		Mayo-Gade	30		3	
Total	3	58	1,200	1,160	120	116

Source: Field Survey, 2021.

Data collection
Data for this study were mainly derived from primary sources. The primary data were collected on socio-economic characteristics of the farmers-herders as well as on causes and effects of clashes between farmers and herders during the 2021/2022 production season.

Method of data analysis
The data were analyzed by the use of descriptive and inferential statistics. The descriptive statistics involved the use of tables, the mean rating, frequency counts and percentages. The inferential statistics involved the use of logit regression model. Logistic regression model is well suited for studying the degree of relationship between a categorical or qualitative outcome variable and one or more predictor variables. In the simplest case of one predictor X and one dichotomous outcome variable Y, the Logistic model predicts the logit of Y from X. The logit is the natural logarithm (In) of odds of Y (Gujarati, 2004).

The logit regression model is explicitly specified as:
$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8$$
$$\beta_9 X_9 + \beta_{10} X_{10} \dots \dots \dots (1)$$

Where:
Y = Interpersonal conflict (any conflict mentioned = 1: otherwise, 0)

X_1	=	Land encroachment
X_2	=	Crop damage by cattle
X_3	=	Inadequate grazing reserves
X_4	=	Lack of access to water point
X_5	=	Pollution of water point
X_6	=	Indiscriminate bush burning
X_7	=	Cattle rustling
X_8	=	Killing of stray cattle
X_9	=	Change in climate condition

β_0 =   Constant

$\beta_1 - \beta_{13}$ =   regression coefficient

μ =   error term

Results and Discussion

The objective of this study is to analyze the socio-economic characteristics of the respondents and determine causes and effects of farmers and herdsmen clashes in Taraba State, Nigeria The result of the finding on Table 2 shows that majority (80%) of the respondents were males and 20% were females. This indicates that majority of the household heads in the study area were males. This is in line with the findings of Adisa (2012) who found out that 96% of farmers in Idah Local Government Area of Benue State were males.

The distribution of the respondents according to their age as indicated on table 2 revealed that 0.8% falls within the age limit of 15 – 25 years, 4.2% were within the limit of 26 – 30 years, 14.2% were within the limit of 31 – 40 years and 80.8% of them were within the limit of 41 years and above. The mean age of the respondents was 36 years. This indicates that majority of them are still in their active economic age and capable of performing varying degrees of farming activities.

Table 2 further indicates the distribution of farmers according to marital status. The results shows that 87.5% of the farmers were married, 0.8% were singles, 5% were divorced and 6.7% were widowers. The fact that majority of the farmers were married could be attributed to the role family labour can play in farming activities. This agreed with the findings of Adeoye (2017) who found out that majority (91%) of the farmers were married.

The section for farmers on Table 2 indicates that 18.3% had received Qur'anic education, 1.7% had Nomadic education, and 10.8% had their primary education while 35% had secondary school education, 30% had tertiary education and 4.2% had not received formal education. This indicates that majority of the farmers in the study area were literates and could easily understand themselves.

According to Ofuoku and Isife (2010) in their research on farmers-herders conflict in Delta State, stated that educated people are more likely to bring better understanding to issues than uneducated people. Educated person may likely be more open to dialogue during clashes.

Table 2 further revealed that 20% of the farmers are Fulbes (Fulani) by tribe 22.5% are Hausas while 57.5% are other tribes in the study area. It shows that other tribes are many in the State where the study was carried out. Ethnicity may play an important role in the clashes/conflict as noted by Tonah (2006) who stated that, farmer-herder differences are not only seen as resource conflict but are also sometimes represented as ethnic conflict involving any two groups. The farmers were distributed according to their occupation as shown in Table 2. The results revealed that 94.2% of the farmers engaged themselves in farming as an occupation while 5.8% are actively involved in mixed farming. These findings agreed with that of Abbas (2012) who found out that majority of the farmers engaged themselves in farming as an occupations.

The result of the finding on Table 2 shows that, 90.8% have been living in the area for more than 16 years, 6.7% have been living from 1 – 15 years in the area while 2.5% have been living from less than 10 years in their respective areas, while none of the farmers had lived for less than 6 years. This result shows that majority of the farmers have been living and grew up in the study area. This is in line with the findings of Abbas (2012) who found out that 92% of farmers in Zaria Kaduna State were the settlers of the area.

The results on Table 2 shows that 53.3% of the farmers had an average household/family size of 6 - 10 persons, 25% had 11 – 15 persons, 10% had 16 – 20 persons, 4/2 % had 1 – 5% person while 7/5% had 21 persons. The mean household size was 8 persons.

This indicates that most of the farmers in the study area had an average to large family size. This large family size could mean that they have so many feed and could also mean that, there is availability of family labour for farming operations on their farms.

Table 2: Distribution of socio-economic characteristics of farmers (n = 120)

Gender	Frequency	Percentage (%)	Mean
Male	96	80	
Female	24	20	
Total	120	100	
Age	Frequency	Percentage (%)	
10 – 15 years	-	-	
15 – 25 years	1	0.8	
26 – 30 years	5	4.2	
31 – 40 years	17	14.2	
41 years and above	97	80.8	36
Total	120	100	
Marital Status	Frequency	Percentage (%)	
Single	1	0.8	
Married	105	87.5	
Divorced	6	5	
Widowed	8	6.7	
Total	120	100	
Ethnic group	Frequency	Percentage (%)	
Fulani	24	20	
Hausa	27	22.5	
Others	69	57.5	
Total	120	100	
Occupation	Frequency	Percentage (%)	
Farming	113	94.2	
Cattle rearing	-	-	
Mixed farming	7	5.8	
Total	120	100	
Years of residence	Frequency	Percentage (%)	
1 – 5 years	-	-	
6 – 10 years	3	2.5	
11 – 15 years	8	6.7	
16 and above	109	90.8	
Total	120	100	
Household size	Frequency	Percentage (%)	
1 – 5 members	5	4.2	
6 – 10 members	64	53.3	
11 – 15 members	30	25	
16 – 20 members	12	10	
21 and above members	9	7.5	
Total	120	100	8
Country	Frequency	Percentage (%)	
Nigeria	120	100	

Niger	-	-	
Chad	-	-	
Cameroon	-	-	
Others	-	-	
Total	120	100	
Years of experience	Frequency	Percentage (%)	
1 – 5 years	2	1.7	
6 – 10 years	9	7.5	
11 – 15 years	10	8.3	
15 and above	99	82.5	
Total	120	100	13
Farm size(ha)	Frequency	Percentage (%)	
Less than 1 hectare	3	2.5	
1 – 2 hectares	50	41.7	
3 – 4 hectares	59	49.2	
5 hectares and above	8	6.6	
Total	120	100	
Land ownership	Frequency	Percentage (%)	
Inheritance	96	80	
Renting	7	5.8	
Purchasing	17	14.2	
Others	-	-	
Total	120	100	
Membership of social group	Frequency	Percentage (%)	
Farmers association	92	76.7	
Miyetti Allah	-	-	
Cooperative society	27	22.5	
Others	1	0.8	
Total	120	100	
Source of income	Frequency	Percentage (%)	
Farming	120	100	
Total	120	100	
Annual Income	Frequency	Percentage (%)	
₦100,000.00 – ₦250,000.00	21	17.5	
₦250,000.00 – ₦300,000.00	22	18.3	
₦300,000.00 – ₦450,000.00	23	19.2	
₦450,000.00 – ₦500,000.00	12	10	
₦500,000.00 and above	42	35	
Total	120	100	₦375,000.00

Source: Field survey, 2022.

Table 2 further shows that 100% of the farmers are Nigerians by birth. This shows that all of the farmers in the study area had a right and privileges to carry out their farming activities in the area. This finding agree with the study of Okoli and Atelhe (2014) who

found out that all the farmers are indigenes of the area (100%) who dominated the study area.

The farmers were distributed according to their years of farming experience as shown on Table 2. The result revealed that 82.5% of the farmers had farming

experience of 15 years and above, 8.3% had 11 – 15 years, and 7.5% had 6 – 10 years while 1.7% had 1 – 5 years of farming experience. This is an indication that most of the farmers might had improved productivity at large. Also, farmers whose years of farming experience is more, may likely be technically efficient in production.

The distribution of farmers according to farm size in hectares as shown on Table 2 indicates that majority of the farmers 49.2% owned a farm of less than 4 hectares or cultivate 3 – 4 hectares, 41.7% cultivates 1 – 2 hectares, 6.6% cultivates 5 hectares and above while 2.5% cultivates less than 1 hectare. This may be due to high pressure on land due to increase in population vis-à-vis the traditional land tenure of inheritance, whereby the land is usually divided into pieces and shared among several family members, renting or sometime sales to someone else. The implication of such act, may lead the farmers to encroach more on grazing reserves and cattle routes, thereby this may create room for clashes. Nyong (2010) revealed that farmer who cultivated a very large size of farm might had to cultivate more farm products.

The distribution of farmers according to membership of social groups as shown on Table 2 indicated that 76.7% belongs to farmers association, 22.5% belongs to cooperative society while 0.8% do not belong to any of the farmers' association or cooperative society. This shows that despite the importance of association or societies of the farmers especially in terms of credit source, access to loans and inputs acquisition, minority of the farmers in the study area do not find it easy to join the farmers' association and or cooperative society. This could be as a result of lack of adequate awareness about the claims of belonging to a group. This is in consonance with the findings of Okeke (2014) who found out that 8% of the farmers in Jama'are Local Government Area of Bauchi State belongs to the farmers' association.

The farmers were distributed according to their source of income in the study area as shown on Table 2. The results revealed that 100% of the farmers got their source of income from farming activities in the study area. This result was consistent with the findings by Adeoye (2017) that majority of the farmers generate their income as farmers. Results from Table 2 also indicates that, 35% of the farmers are earning ₦500,000.00 and above, 19.2% earns ₦300,000.00, 18.3% earns ₦250,000.00 – ₦300,000.00, 17.5% earns ₦100,000.00 – ₦250,000.00 while 10% are earning ₦450,000.00 - ₦500,000.00 as their annual income in the study area. This is in consonance with the findings of Adebayo and Olaniyi (2008). The annual income generated is usually based on what they produced or cultivate from their farms.

The result of the findings on Table 3 indicates that 116 cattle herders representing 100% of the sampled herders were males. This result was consistent with the findings by Adisa (2012) that all herdsmen were males. As evident from the findings, cattle herding seems to be a male dominated enterprises in the study area.

The result from Table 3 indicates that, majority of the herders were within the age range of 41 years and above (80.2%) 31 – 40 years (14.6%) and 5.2% were within the age of 26 – 30 years respectively. This indicates cattle herding is predominantly carried out by middle aged people within the range of 36 years and above who has the energy and more resilience in the herding sector. This is in consonant with the findings of Adebayo and Olaniyi (2008), who reported that mean age of the herders was 36 years. This indicates that most of the herders were youths.
Table 3 further revealed the distribution of herders according to marital status. The result shows that 93.1% of the herders were married, 6.0% were singles, and 0.9% were divorced while none of the herders is widowed. The fact that majority of the herders were married could be attributed to the role that family labour plays in the herding activities. The marital status corroborates the findings of Adelakun *et.al.* (2015) in his study on socio-economic and effects of farmer-pastoralist conflict who found out that majority (81.4%) of the herders were married.

The distribution of herders in Table 3 indicates that 71.5% had Qur'anic education, 14.7% had nomadic

education, 9.5% had tertiary education, and 3.4% had secondary education. This indicates that majority of the herders in the study area were literates and could easily understand and accept new ideas brought to them. According to Ofuoku and Isife (2010) in their research on farmers-herders conflict in Delta State, educated people are more likely to bring better understanding to issues than uneducated people. Educated person may likely be more open to dialogue during conflicts.

The herders were distributed according to their ethnic group as shown in Table 3. The results revealed that 77.6% of the herders are Fulbes (Fulani tribe), 12.9% of the herders are other tribes, while 9.5% of the herders are Hausas in the study area. This indicates that Fulbes are the majority tribe. It further indicates that Fulbes are the majority in the study area. The herders were distributed according to their occupation as shown on Table 3. The results revealed that 69% of the herders engaged themselves in practicing mixed farming while 31.0% were actively involved in cattle rearing. This finding agreed with that of Abbas (2012) who found out that majority (72%) were engaged in mixed farming.

The results of the finding on Table 3 shows that 93% of the herders have been residing in the study area for more than 16 years and above, 5.2% had between 11 – 15 years, 0.9% had between 6 – 10 years while 0.9%, had between 1 – 5 years of residence. According to the findings by Abbas (2012), in a research conducted on No Retreat No Surrender between pastoralists and farmers in Northern Nigeria shows that majority of the herders are those that lived in the community.

The results on Table 3 further shows that 31.9% of the herders have average household size 6 – 10 persons, 29.3% had 11 – 15 persons, and 19.8% had 21 persons and above, 14.7% had 16 – 20 persons and 4.3 % had 1 – 5 persons. The mean household size was 8 persons. This shows that most of the herders in the study area had average to large family size.

The distribution of herders according to their country of origin as shown on Table 3 revealed that 100% of the herders were indigenes of Nigeria by birth. This shows that all of the herders in the study area had a right to own cattle for rearing in the study area. This is in line with the findings of Okoli and Atelhe (2014) who found out that all the herders lived in the study area with their cattle.

The result on Table 3 also shows that 32.8% of the herders had 11 – 20 flocks of cattle, 29.3% had 1 – 10 flocks of cattle, 24.1% had 20 – 30 flocks of cattle, 8.6% had 40 – 50 flocks of cattle and 5.2% had others which is above 50 flocks of cattle in the study area. The mean of flocks of cattle for herders was 16 flocks. This finding agrees with that of Abbas (2012) who found out that majority of the herders (81%) had flocks of cattle.

The distribution of herders according to cattle ownership for rearing shown on Table 3 indicates that 61.2% of the herders own their cattle through inheritance, 27.6% through cattle rearing and 11.2% had it by purchasing the cattle for rearing in the study area. The herders were distributed according to their years of experience on cattle rearing as shown on Table 3. The result revealed that 41.4% of the herdsmen had cattle rearing experience of 30 years and above, 38.8% had 21 – 30 years, 16.4% had 16 – 20 years, and 3.4% had 11 – 15 years while none of the herdsmen had the experience on cattle rearing less 11 years in the study area. The herders were asked to indicate whether or not they belong to any herders association, and the results obtained as shown in Table 3 indicates that all of the herders (100%) do not belong to any other groups rather than Cattle Breeders Association (MACBAN). This is in line with the study of Olaniyan *et al.* (2015) who affirms that a typical herdsman will not belong to any member of other group rather than his group.

The herders were distributed according to their source of income in the study area as shown on Table 3. The results revealed that 73.3% got their source of income from mixed farming (cattle rearing and farming) in the study area and 26.7% got theirs from cattle rearing. This indicates that majority of the

herdsmen in the study area were mixed farmers and they can be in a better position of getting more money. This is in line with the study of Mohammed *et al.* (2015) who affirms that a source of income of a herder is determined from his cattle and herding activities.

The results from Table 3 indicates that 48.3% of the herders earned ₦1,000.000 – ₦3,000.000 22.4%

earned ₦100,000 – ₦300,000; 14.7% earned ₦3,000.000 and above, 12.9% earned ₦300,000 – ₦500,000 and 1.7% also earned ₦500,000 - ₦1,000.000 as their annual income in the study area. The mean annual earning was ₦200, 000.00. This is in line with the study of Abbas (2012) who affirms that the annual income of herder is when he sells cattle.

Table 3: Distribution of socio-economic characteristics of herders (n = 116)

Gender	Frequency	Percentage (%)	
Male	116	100	
Female	-	-	
Total	116	100	
Age	Frequency	Percentage (%)	
10 – 15 years	-	-	
15 – 25 years	-	-	
26 – 30 years	6	5.2	
31 – 40 years	17	14.2	
41 years and above	93	80.2	
Total	116	100	36
Marital Status	Frequency	Percentage (%)	
Single	7	6.0	
Married	108	93.1	
Divorced	1	0.9	
Widowed	-	-	
Total	116	100	
Level of Education	Frequency	Percentage (%)	
Qur'anic	83	71.5	
Nomadic	17	14.7	
Primary	1	0.9	
Secondary	4	3.4	
Tertiary	11	9.5	
None of the above	-	-	
Total	116	100	
Ethnic group	Frequency	Percentage (%)	
Fulbe	90	77.6	
Hausa	11	9.5	
Others	15	12.9	
Total	116	100	
Occupation	Frequency	Percentage (%)	
Farming	-	-	
Cattle rearing	36	31.0	
Mixed farming	80	69	
Total	116	100	
Years of residence	Frequency	Percentage (%)	

	Frequency	Percentage (%)	
1 – 5 years	1	0.9	
6 – 10 years	1	0.9	
11 – 15 years	6	5.2	
16 and above	108	93	
Total	116	100	
Household size	Frequency	Percentage (%)	
1 – 5 members	5	4.3	
6 – 10 members	37	31.9	
11 – 15 members	34	29.3	
16 – 20 members	17	14.7	
21 and above members	23	19.8	
Total	116	100	
Country	Frequency	Percentage (%)	
Nigeria	116	100	
Niger	-	-	
Chad	-	-	
Cameroon	-	-	
Others	-	-	
Total	116	100	
Flocks of cattle	Frequency	Percentage (%)	
None	-	-	
1 – 10	34	29.3	
11 – 20	38	32.8	
20 – 30	28	24.1	
40 – 50	10	8.6	
50 and above	6	5.2	
Total	116	100	16
Ownership of Cattle	Frequency	Percentage (%)	
Inheritance	71	61.2	
Purchase	13	11.2	
Cattle rearing	32	27.6	
Others	-	-	
Total	116	100	
Years of experience	Frequency	Percentage (%)	
1 -10 years	-	-	
11 – 15 years	4	3.4	
16 – 20 years	19	16.4	
21 – 30 years	45	38.8	
30 years and above	48	41.4	
Total	116	100	
Membership of social group	Frequency	Percentage (%)	
Farmers association	-	-	
Cattle breeder association	116	100	
Cooperative society	-	-	
Others	-	-	
Total	116	100	
Source of income	Frequency	Percentage (%)	

Mixed farming	85	73.3	
Cattle rearing	31	26.7	
Others	-	-	
Total	116	100	
Annual income	Frequency	Percentage (%)	
₦100,000.00 – ₦300,000.00	26	22.4	
₦300,000.00 – ₦500,000.00	15	12.9	
₦500,000.00 – ₦1,000,000.00	2	1.7	
₦1,000,000.00 – ₦3,000,000.00	56	48.3	
₦3,000,000.00 and above	17	14.7	
Total	116	100	₦200,000.00

Source: Field survey, 2022

Causes of clashes between farmers and herdsmen in Taraba State

The result of the Logistic Regression analysis shows the causes of clashes between herdsmen and farmers in Taraba State (Table 4). Nine variables were identified as causes of clashes between herdsmen and farmers in Taraba State, out of which five were statistically significant at 0.05% level of significance. The findings of the study revealed that land encroachment and crops damage by animals were found to be positively significant at 5% level of significant. This signifies that increase in land encroachment and crops damage by animals would lead to increase of clashes between them by 6.2% and 6.9%. These areas of encroachment agree with most of the conflict points recorded, Nformi, *et al.* (2014) also indicated that farmer's encroachment on cattle routes is the real cause of clashes between farmers.

Table 4: Causes of clashes between farmers and herdsmen in Taraba State

Causes of Clash	Coef.	Std. Error	T
Constant	49.06765	23.685	2.09**
Land encroach. on cattle routes	6.21298	0.9379683	6.62**
Crop damage by animals	6.887631	4.226633	1.63**
Inadequate grazing reserves	4. 248965	2.120463	2.00**
Lack of access to water point	1.197632	0.424307	2.82**
Killing of stray animals	1.224872	1.475858	0.83
Pollution of water point	-0.1631568	1.374587	-0.12
Indiscriminate bush burning	1.537417	0.6834906	2.25**
Perceived hatred	38.38607	493.2808	0.08
Change in climatic condition	0.913344	0.5143153	0.18
Pseudo R^2	0.9043		
Chi^2	126.19		
Probability level	0.0000		

Source: Field survey, 2021/2022

** = significance at 5% (0.05 level of significance.

The analysis of the study shows that land encroachment on cattle routes, crop damage by animals, inadequate grazing reserves, lack of access to water point and indiscriminate bush burning were positively significant at 0.05 level of significance respectively. This indicates that increase in land encroachment on cattle routes, crop damage by animals, inadequate grazing reserves, lack of access to water point and indiscriminate bush burning increases clashes between the herders and farmers by

6.2%, 6.9%, 4.3%, 1.2% and 1.5% in the study area respectively. This is in line with the findings of Ofuoku and Isife (2010) that during the dry season, herders find it difficult to feed their cattle. And so, before the onset of rainy season, some of them set bushes on fire which sometimes escalate into the farm to destroy both harvested and un-harvested crops. Abbas (2012) and Blench (2010) also suggested that the major source of tensions between pastoralists and farmers is basically on land related issues and grazing area accounting for the majority of conflicts. Therefore, the study suggests that land encroachment on cattle routes, crop damage by animals, inadequate grazing reserves, lack of access to water point and indiscriminate bush burning were the main causes of clashes between herdsmen and farmers in Taraba State.

Effects of clashes on income of herdsmen and farmers in Taraba State

The results in Tables 4 and 5 shows the effects of clashes on income of farmers and herdsmen in Taraba State. Based on economic and econometric criteria linear regression function was selected as lead equation or line of best fit. The R^2 value which measures the proportion of the variation in dependent variable (Y) that is explained by the independent variables included in the model was 88.5% and 74.2%. The F-value was 140.297and 54.245 and was significant at 0.05 level of significance of probability. This implies that all the variables included in the model were all important in explaining the variations that occurred in the effects of income in the study area.

The estimated parameter for loss of animals and loss of crop in the field was negative and significant at 0.05 level of significance of probability. This implies that an increase in the loss of animals and loss of crop in the field as a result of clashes would lead to decrease in the level of income of both herdsmen and farmers in the study area. This findings is in line with that of Blench (2010) who indicated that grazers also suffer from material damages when the farmers inflict physical injuries on the cattle by using cutlasses, spears or guns which sometimes resulting to dead of the animals. Loss of family members was found to be negative and significant at 0.05 level of significance for both herdsmen and farmers, meaning that an increase in the loss of family members will result to decrease in the amount of income of herdsmen and farmers. This agrees with the findings of Joseph (2012) who found that, in a border between Nassarawa and Benue State, nomadic pastoralists and farmers conflicts left not less than 50 persons death.

The study also revealed that displacement of family members and frequency of displacement were found to be negatively significant at 0.05 level of significance probability level. This signifies that increase in displacement of family members and frequency of displacement of herdsmen in Taraba State due to clashes would result to decrease in their income as reported by Blench, (2010) and Abbas (2012) that persistent conflicts over land resources have caused population displacement which as a result, changed the fabric of custom and habitual behaviour in northern Nigeria. This led to low agricultural output, which resulted in malnutrition and disease; and by inducing people to leave. Economic decline may not erode confidence in the national purpose and also upset the traditional balance of economic and political authority between ethnic groups in the area. Finally, the coefficient of decrease in herd and farm size in the study area were negatively significant at 0.05 level of significance, meaning that increase in clashes between farmers and herders which lead to decrease in the size of herds and farm affect the income of both of them. This is in line with results of Blench (2010) who indicated that, in Santa sub-division in Pinyin in 1994 a grazer lost his entire herd and farmers lost their farms as a result of attack on the cattle by farmers, open confrontation results in rural insecurity and out migration. This study indicated that clashes between farmers and herders in the study area seriously affects their income level which conforms to *a priori* expectation.

Table 4 Effects of clashes on income of farmers in Taraba State

Effects of Clash on Farmers	Coef.	Std. Error	T
Constant	-714891.635	196789.338	-3.633**

Loss of crop on the field	-513594.326	58783.664	-8.737**
Loss of family members	-219247.424	52694.190	-4.161**
Displacement of family member	-73.092	54410.555	-0.001
Frequent of displacement	12546.451	44245.279	.284
Crop loss in the store	-49316.371	47797.413	-1.032
Decrease in farm size	129628.290	25732.295	5.038**
R^2	742		
Adjusted R	729		
F	54.245		
Probability level	.000		

Source: Field survey, 2021

** = significance level at 5% (0.05 level of significance)

Table 5: Effects of clashes on income of herdsmen in Taraba State

Effects of Clash on Herders	Coef.	Std. Error	T
Constant	-6440436.852	439566.677	-14.652**
Loss of animals	-121.586	56.920	-2.136**
Loss of family members	-921.728	186.004	-4.955**
Displacement of family member	-105632.207	44799.858	-2.358**
Frequent of displacement	-715496.201	31838.871	-22.472**
Loss of crop on the field	223485.804	309986.062	0.721
Decrease in herd size	-185776.984	44218.003	-4.201**
R^2	.885		
Adjusted R	.879		
F	140.297		
Probability level	.000		

Source: Field survey, 2021

** = significance level at 5% (0.05 level of significance)

Conclusion

The study concluded that five variables that were significant at 5% level of significance were the factors responsible for the causes of the clashes/conflict in the study area. These are land encroachment on cattle routes, crop damage by cattle, inadequate grazing reserves, lack of access to water and indiscriminate bush burning. Avoidance of these causative factors will enhance cordial relationship between farmers and herdsmen and minimize clashes in future in the study area.

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