



## ANALYSIS OF PERCEIVED CAUSES AND FACTORS INFLUENCING VEGETABLE FARMERS-PASTORALISTS CONFLICTS IN KADUNA STATE, NIGERIA

<sup>1</sup>Lawal Bello, <sup>2</sup>Sani, M. H., <sup>3</sup>Abu, I. A. and <sup>2</sup>Danwanka, H. A.

<sup>1</sup>National Biotechnology Development Agency,

Umaru Musa Yar'adua Way, Airport Road, Lugbe, Abuja

<sup>2</sup>Department of Agricultural Economics,

Abubakar Tafawa Balewa University, Bauchi, Nigeria

<sup>3</sup>Department of Agricultural Extension Services, University of Maiduguri,

Borno State, Nigeria

**Corresponding Authors' E-mail:** duruminzazzau@gmail.com **Tel.:** +2348069777032

### ABSTRACT

The study was carried out on analysis of perceived causes and factors influencing vegetable farmers-pastoralists conflicts in Kaduna State, Nigeria. Multi-stage sampling procedure was employed to select 360 respondents from the study areas of Northern, Southern and Central Senatorial districts of Kaduna State. Data were collected through structure questionnaire and analyzed using descriptive (mean, frequency distribution, percentages and standard deviation) and inferential statistics (logistics regression). The results showed that 80.6% and 91.6% of the vegetable farmers and pastoralists were found to be male, majority (80.2%) and (86.1%) were married farmers and pastoralists, respectively. Also, the vegetable famers and pastoralists had relatively higher education of 34.1% and 31.8%, respectively. A grand mean of 3.79 was revealed as the perceived causes of vegetable farmers-pastoralists conflicts meaning there was persistence conflicts in the study area. So, the results disclosed the major causes of farmer-pastoralists conflicts to include influx of migrant herders/transhumance and night grazing ( $\bar{X} = 4.32$ ), inadequate grazing reserve ( $\bar{X} = 4.25$ ) and destruction of crop by animals ( $\bar{X} = 4.24$ ) as perceived by vegetable farmers. However, the pastoralists perceived major causes of conflicts to include inadequate grazing reserve ( $\bar{X} = 4.44$ ), destruction crops by animals ( $\bar{X} = 4.21$ ) and encroaching grazing reserves ( $\bar{X} = 4.11$ ). The results of logit regression on factors influencing farmers-pastoralists showed that age, and widow, number of livestock were found to be positively significant ( $P \leq 0.01$ ), respectively. Household size, educational level and farm size were significant ( $P \leq 0.05$ ) in influencing conflicts. The coefficient (-0.16) of number of livestock was found to be negative but significant ( $P \leq 0.01$ ) implying that as number of livestock increases, the tendency to participate in a conflict also increases. It was concluded that vegetable farmers-pastoralists conflicts in the study was mostly influenced by age, education level, household size, farm size and number of livestock. The study recommended that grazing areas should be provided for pastoralists as a means of preventing farmers and pastoralist conflicts like the ranching (*ruga*) policy by the federal government and private partners.

**Keywords:** Conflicts, Descriptive statistics, Farmers, Pastoralists, Logistic regression.

### INTRODUCTION

Competition, rather than consensus is characteristics of human relationships (Marx, 1971) such that broader social structures and organizations reflects the competition for resources and the inherent inequality competition entails to the extent that some people and organizations have more resources, that is, power and influence, and use those resources to maintain their positions of power in the society (Marx, 1971).



Livestock development is an important component of Nigeria agriculture with abundant social and economic potentials. About 60% of the ruminant livestock population is found in the country's semi-arid zone and mostly managed by pastoralists (Food and Agriculture Organization [FAO], 2019).

Livestock and arable farming both of which are very important sub-sectors of the Nigerian Agricultural sector are competitively depended on relatively small land resources, which tends to lead crises and conflict. These have further resulted in a decline in Agricultural production. Furthermore arable farming and pastoralist co-exist in relationship which could be termed as Symbolic, i.e., the livestock feed on the crops residues while manure from the livestock enriches the soil with valuable amount of nutrients which encourages the growth and development of crops. The establishment of demarcated rangelands and passageways (cattle corridors) allow the livestock to access water points and pastures without causing damage to cropland (FAO, 2011).

Pastoralists usually graze over areas outside farm lands, and these have been accepted to be the norm from time immemorial. Their movements are opportunistic and follow pasture and water resources in a pattern that varies seasonally or year-to-year according to availability of resources (FAO, 2011). The patterns of movement may be controlled by seasonal climate variations. However, increase in population, drying of waterholes, shifting in rainfall pattern leading to drought as a result of the changing climate affects both sectors of Agriculture. At the same time, smaller and local agricultural production systems are becoming more and more integrated into the global economy, pushing up land values. These, coupled with the absence of good governance and the increase in level of poverty creates avenue for conflicts. Both customary and statutory land management systems are often not responding adequately to the tenure insecurity these changes bring (Djiré, 2014).

Conflict between farmers and pastoralists has existed since the beginnings of agriculture, but the prevalence of tsetse flies and low settlement densities kept the incidence of clashes at a low frequency until the twentieth century. In West Africa, the introduction of cheap trypanocides and other veterinary drugs increased herd sizes to levels that compelled herders to seek pastures outside their traditional ecological range (Blench and Dendo, 2003). Similarly, improved human health has increased overall population and thus pressure on arable land. Nonetheless, the persistence of slash and burn agriculture typical of much of semi-arid and sub humid West Africa allowed the two groups to co-exist, especially through the exchange of crop residues for manure. However, the marked expansion of riverine and valley-bottom (*Fadama*) cultivation since the 1980s meant that herders and farmers are now competing very directly for access to river banks with a consequent increase in conflict. Also, increasing political control of Local Governments (LGs) by representatives of farming populations has meant pressure both to invade land reserved for grazing and to exclude pastoralists from high-productivity areas. In Nigeria, in particular, this conflict has now been subsumed into a broader dichotomy of religion and disputes over access to resources are now framed in religious terms. Increasing availability of modern weapons has increased the intensity and violence of these disputes. It is often said that Pastoral Organizations, such as Miyetti Allah, can play a role in conflict mediation. However, their record in this area is very poor because they are in reality highly dispersed and their ability to lobby correspondingly limited the changing nature of farmers-pastoralists conflict in Nigeria (Blench and Dendo, 2003; and Garba *et al.*, 2014).

Changing access rights as traditional communal property are being replaced by private ownership (Adisa, 2012). It is common to see that *Burtali* (cattle pathways) close to cities do not exist anymore as houses and filling (petrol/gas) stations have taken over their places. Cattle now have to compete with motorist to the only path that is tarred road. There are many other



predominant causes. Blockage of waterholes by farmers and fishermen, crop damage by pastoralist livestock and reprisal attacks on pastoralist by sedentary farmers when ethnic or religious disputes occur somewhere else (Umar, 2002; and Bujra, 2002).

According to the conflict perspective, society is constantly in conflict over resources, and that conflict drives social change. For example, conflict theorists might explain the civil rights movements of the 1960s by studying how activists challenged the racially unequal distribution of political power and economic resources. As in this example, conflict theorists generally see social change as abrupt, even revolutionary, rather than incremental. In the conflict perspective, change comes about through conflict between competing interests, not consensus or adaptation. Conflict theory, therefore, gives sociologists a framework for explaining social change. All conflicts share common qualities. The first is that there is a kind of contact between the parties that are involved, secondly, the parties in conflict perceive conflicting views and finally, one of the parties always wants to redress existing contradictions (Ofuoku and Isife, 2009).

Many studies attempted to assess the occurrence of farmer-pastoralist conflicts in the study area but there is gap in literature in terms of extension methodologies used in resolving conflicts in the study area. Therefore, the study was design specifically to analyze conflict resolution between vegetables farmers and pastoralist through extension methods approaches in Kaduna State. The specific objectives were to: Describe the socio-economic characteristics of the respondents; determine perceived causes of vegetable farmers-pastoralists conflicts and estimate the factors influencing farmers-pastoralists conflicts.

## **MATERIALS AND METHODS**

### **The Study Area**

Kaduna State, north central Nigeria, is politically classified as belonging to the now 'North-West' zone of the current six geo-political zones of Nigeria. It is populated by about 59 to 63 different ethnic groups, if not more, with the exactitude of the number requiring further verification through genuine field work (Kothari, 2003). The Hausa and Fulani are the dominant ethnic groups followed by at least 60 others. Kaduna State has a population of 6,113,503 (NPC, 2006) and 8,197,515 in 2018 projected at 3.5% population growth rate. The State comprised of 23 Local Government Areas (LGA) and 3 senatorial districts. The State also shares common boundaries with Zamfara, Katsina, Kano, Bauchi, Plateau, Nasarawa, Niger State and Abuja Capital Federal Territory. It covers about 46,053 square kilometer occupying about 5% of the total land area of the 923768 square kilometer of Nigeria. It lies between latitudes 11° 32 and 9° 02 north of the equator and longitudes 08° 50 and 06° 15 east of the prime meridian (Kaduna State Agricultural Development Programme, 2019). The rainy season varies from March-October with the wettest being in the southern part. Kaduna (the State capital) falls within the wetter area with an average maximum rainfall of 361 mm while Ikara in the drier north had an average of 146mm during the rainy season over the past 9 years. The duration of rain days varies from about 65 in Ikara to about 165 in Kaduna. The pattern of temperature and rain fall determines the types of crops, planning of farm operation, food and animal production and assessment of drought and erosion hazards on different part the State. After the wet season when the bulk of the food crops are grown, there follows the dry Harmattan season during which the days are cool and night chilly. This period lasts from around November-February and coincides with the harvest period.

The vegetation of Kaduna State is the guinea savannah in the southern part where the rainfall is heavier savannah wood land with trees like Shea-butter, locust bean and tamarind predominates. In the dried area of the north and north-west, the vegetation is made up of shade



trees like baobab, silk, cotton, Shea-butter, date palm. The less fertile laterite soil found in the drier area is suited to millet and groundnut production, while the black soil of the more southerly rivers valleys favors cotton, maize and root crops.

Soil types, their fertility and potential system of management exert considerable influence agricultural production in Nigeria. Regional variation in soil types for example are often related to the prospects of growing particular crops in different parts of the country. Different level of fertility is also related to various soils types and traditional soil management technology used in their maintenance. Thus the soil variables mentioned above influence agricultural production both individually and interaction through one another.

### **Sampling Procedure**

Multi-stage sampling procedure was employed to select the respondents for the study. Kaduna State comprise of three senatorial districts (Northern, Southern and Central Senatorial Districts). In the first stage, two (2) LGAs were purposively selected from each Senatorial District making a total of six (6) for the study. The purposive sampling was used to capture those LGAs with the intensity of vegetables production as well as the concentration of pastoralists. In the second stage, three (3) communities were also purposively selected from each LGA making a total of 18 villages. The purposive sampling was also based on intensity of vegetable production and pastoralist in the area. Finally, 10 each of vegetables farmers and pastoralists were systematically selected from each community making a total sample size of 360 respondents for the study. The list of cluster vegetables farmers was obtained from the Kaduna State Agricultural Development Programme (KADP) and the list of home-based pastoralists were also obtained from the Department of Livestock Kaduna State Ministry of Agriculture and Natural Resources (KSMOANR).

### **Method of Data Collection**

Primary data were used for the study and were collected using questionnaires with the assistant of well-trained enumerators/extension agents under the supervision of the researcher. Similarly, interview schedule was used to obtain information from farmers and pastoralists who cannot read and write.

### **Analytical Techniques**

The study used both descriptive (mean, frequency distribution, percentages and standard deviation) and inferential statistics (Logistics regression). The implicit form of the model is:

$$Y = F(X_1, X_2, X_3, X_4, X_5, \dots, e) \quad \dots(1)$$

From equation 1, then explicit form of the model was derived as:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e \quad \dots(2)$$

where;

Y = Likelihood to participate in conflict (Dummy variable) to participated = 1, not participated = 0

$b_1 - b_7$  = Regression coefficient

$X_1$  = Age (in years)

$X_2$  = Household size (in number)

$X_3$  = Educational status (no formal education = 0, non-formal education = 5, primary education = 6)

$X_4$  = Years of experience in crop farming/herding (in years)

$X_5$  = Farm size (ha)

$X_6$  = Number of livestock kept (in number)

$X_7$  = Operating capital (in Naira)

$b_i$  = coefficients of the explanatory variables



e = Error term.

## RESULTS AND DISCUSSION

### Socio-economic Characteristics of the Respondents

Table 1 shows the distribution of socio-economic variables of the respondents in the study area. According to the results, 80.6% and 91.6% of the vegetable farmers and pastoralists were found to be male. This might be likely due to the culture of the people in the study area where women do not fully participate in both crop and livestock production. The result is closely related to that of Garba *et al.* (2014) who found that most of the farmers and pastoralists were male in Bauchi State, Nigeria.

**Table 1:** Socio-economic Characteristics of the Respondents

Variable	Farmers		Pastoralists		Pooled	
	Frequency	%	Frequency	%	Frequency	%
<b>Sex</b>						
Male	141	80.6	164	91.6	152.5	86.1
Female	34	19.4	15	8.4	24.5	13.9
<b>Marital status</b>						
Married	138	80.2	164	91.6	151	85.9
Single	29	16.9	3	1.7	16	9.3
Widow	5	2.9	10	5.6	7.5	4.25
Divorce	-	-	2	1.1	1	0.55
<b>Education status</b>						
Non-formal education	29	17.1	37	22.3	33	19.7
Primary	29	17.1	33	19.9	31	18.5
Secondary	15	8.8	26	15.7	20.5	12.25
Tertiary	58	34.1	49	29.5	53.5	31.8
Qur'anic	39	22.9	21	12.7	30	17.8

Source: Field survey (2018)

The result also shows that majority (80.2% and 86.1%) of the farmers and pastoralists were married. This was probably due to early marriage that is predominant in the study area. The result shows that both the vegetable farmers and pastoralists had relatively higher education of 34.1% and 31.8%, respectively. This result indicates that literacy level is high in the study area. By implication there is less resistance to the adoption of agricultural technologies by the farmers in the study area. These findings agreed with Owolabi *et al.* (2016) who states that majority of farmers in Kaduna State were still in their active age. Oladipupo and Ademola (2011) also reported the mean age of the respondents of  $22.7 \pm 2.9$  years and 58.9% were females. Sani *et al.* (2014) reported that there was a 46% increase in livestock income and 87% in the rich tercile (cattle business) for the beneficiaries implying huge participation in pastoral activities. This implies that crops and livestock activities contributed the largest share of household income in the study area. Fifty-six percent (56%) of respondents had experienced sexual intercourse; of this number 9.0% reported that their first sexual intercourse violence or conflicts was due to rape. Forty-seven percent (47%) of the entire sample had ever experienced at least a form of non-consensual sex (NCS) out of which 70.5% were affected during the six months preceding the study.





### **Perceived Causes of Vegetable Farmers-Pastoralists Conflicts**

The results in Table 2 depict the causes of farmers-pastoralists conflicts in Kaduna State. The grand mean for their perception was found to be 3.79. The results of Table 2 reveals that the major causes of vegetable farmers-pastoralists conflicts include influx of migrant herders/ transhumance and night grazing ( $\bar{X} = 4.32$ ), inadequate grazing reserve ( $\bar{X} = 4.25$ ) and destruction of crop by animals ( $\bar{X} = 4.24$ ) among others as perceived by vegetable farmers. This implies that vegetable farmer-pastoralists conflicts are caused by influx of migrant herders and crop destruction as perceived by the farmers.

However, as reported in Table 2, the pastoralists perceived that the major causes of conflicts include inadequate grazing reserve ( $\bar{X} = 4.44$ ), destruction crops by animals ( $\bar{X} = 4.21$ ) and encroachment of grazing reserves ( $\bar{X} = 4.11$ ). Olobatoke and Amusain (2017) reported that 97.40% pastoralists said no specified grazing routes and crop farms located along the few existing grazing routes are the major causes of conflicts. Destruction of crop by animals shows that there was prevalence of destruction of crops by animals in the study area that people take as a serious cause of the problem. Unauthorized grazing on harvested residues also triggered clashes between farmers and pastoralists. Encroachment of grazing reserve by farmers also causes a threat to peace in the study area. Inadequate grazing reserve also is serious problem to harmony between Farmers-pastoralists in the study area. Conversely, Garba *et al.* (2014) related that farmer-pastoralist conflicts were caused by lack of well-defined cattle route, poor government attitude and inadequate grazing reserves in western zone of Bauchi State, Nigeria.



**Table 2:** Causes of Farmers-Pastoralists Conflicts in Kaduna State

Variable	Farmers		Pastoralists		Pooled	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Destruction of crop by animals	4.24	.870	4.21	.490	4.22	.680
Contamination of streams by animals	3.80	.693	3.49	.817	3.64	.755
Over grazing of fallow land	3.06	1.181	2.57	1.341	2.82	1.261
Unauthorized grazing on harvested residues	4.10	1.069	3.96	1.293	4.03	1.181
Little respect for traditional grazing customs	3.56	.800	4.06	1.010	3.81	.905
Deliberate hostility between parties	3.13	1.042	3.97	1.121	3.55	1.082
Tribal/differences	3.66	1.159	3.86	1.235	3.76	1.197
Echoroachment of grazing reserve	4.02	1.077	4.11	1.211	4.07	1.144
Inadequate grazing reserve	4.25	.786	4.44	.954	4.34	.870
Sexual harassment of women by nomads	3.02	1.486	3.07	1.436	3.04	1.461
Indiscriminate defecation by cattle on roads	3.67	.711	3.31	.990	3.49	.850
Indiscriminate bush burning by crop farmers	3.24	1.224	3.58	.993	3.41	1.109
Harassment of nomads by hosts youths	3.70	.859	3.91	.597	3.80	.728
Little respect for traditional farming customs	3.65	.583	3.80	.541	3.73	.562
Cattle theft	2.93	1.165	3.43	1.027	3.18	1.096
encroachment by herders	4.13	1.168	3.92	1.046	4.02	1.107
Influx of migrant herders/transhumance	4.32	1.004	4.31	.941	4.32	.972
Blockage of stock route ( <i>Burtali</i> ) and water points	3.66	1.340	4.01	1.073	3.84	1.206
Night grazing	3.99	1.021	3.90	.943	3.94	.982
Competition on land and water	3.52	.867	3.74	.665	3.63	.766
Stray cattle	3.19	1.163	3.25	1.014	3.22	1.089
Climate and environmental factors	3.10	1.203	3.68	1.211	3.39	1.207
Antagonistic perception between farmers and pastoralist	3.41	1.206	4.01	1.112	3.71	1.159
Grand Mean	3.79		3.93		3.86	1.06

Source: Field survey (2018)

### Factors Influencing Farmers-Pastoralists Conflicts

Table 3 represents the logit regression result of factors influencing farmers-pastoralists conflicts. The result reveals that the model was reliable as depicted by Prob>Chi square ( $P < 0.01$ ). The results also showed that age and widow were found to be positively significant ( $P \leq 0.01$  and  $P \leq 0.1$ , respectively). The result also shows that household size, educational level, farm size and number of livestock were significant in influencing conflicts at 5% and 1% level of significance. The age of the respondents was found to be positively significant (1%) in influencing conflict. This implies that increased in either farmers or pastoralists' age increases their chance of involvement into conflicts all other variables remain constant.

Based on the findings, there was no difference between married and singles but a different exist between widow and married people ( $P \leq 0.1$ ). This is probably due to those that



are widowed are and possibly lost their precious ones as a result of farmers-pastoralists conflicts.

The coefficient (-0.7) of education level was found to be negative but significant ( $P \leq 0.1$ ). This shows that as education level increases, the tendency of participating into conflict decreases (Table 3). This is in accordance to *a priori* expectation as education influences behavioural changes. As people acquire knowledge their behaviour will improve and thus will tolerate conflicting situation. Further to results of Table 3, the coefficient of (-0.64) was found to be negative but significant ( $P \leq 0.05$ ). This shows that as household sizes increases the probability of participating into conflict is reducing. This is probably due to elders that will counsel the younger ones.

The coefficient (-0.16) number of livestock was found to be negative but significant ( $P \leq 0.01$ ). This shows that as number of livestock increases also the tendency to participate in a conflict also increases. This might be due to the fact that people with larger herds tends to encroach other farms and graze illegally which result into chaos. Owolabi *et al.* (2016) agreed with this revealing that losses of pastoralists cattle was major causes of re-occurring farmers-pastoralists clashes in Benue State, Nigeria

**Table 3:** Factors Influencing Farmers-Pastoralists Conflicts in Kaduna State

Variable	Coef.	Std. error	z	P> z
Constant	-20.79	7.37	-2.82	0.005
Age	0.55	0.21	2.63***	0.008
Marital status	-3.83	1.98	1.94*	0.052
Household size	-0.64	0.31	-2.05**	0.04
Education level	-0.70	0.35	-1.99**	0.046
Experience in crop farming	-0.07	0.05	-1.43	0.152
Farm size	1.03	0.38	2.74***	0.006
Number of livestock	-0.46	0.17	-2.69***	0.007
Prob> chi2	0.001			
Pseudo R-square	0.54			

Source: Field survey (2018)

## CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it was concluded that age, education level, household size, farm size and number of livestock were found to be socio-economic characteristics influencing vegetable farmers-pastoralists' conflict. It was recommended from the results that grazing areas should be provided for pastoralists as a means of preventing farmers and pastoralist conflicts like the upcoming ranching (*ruga*) policy by the federal government and private partners.

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