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Perceived Factors Responsible for Herders-Farmers' Communal Conflict in Plateau State, Nigeria

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ABSTRACT: *This study was carried out to assess farmers' perception on the impact of grazing livestock on some tuber crops (yam, cassava and potato) in North Central Nigeria. A multi-stage sampling technique was adopted to select randomly 1200 tuber crop farmers in the study area* (Abuja). *Data were collected using structured questionnaire. Descriptive statistic and* analysis of variance (ANOVA) were used to analyze the results. *The socio-economic analysis showed that most of the farmers were male and married. Most of them had a household size of 6-10 people and were between the ages 41 and 50 years meaning they were within economically active age. Also, most of them had farming experience of 11-20 years and had secondary school education. Majority of them were smallholder farmers and had a maximum of 3 hectares of farmland. Cassava was the most affected tuber crop by grazing livestock in the study area while cattle were the most destructive livestock to tuber crops in the study area. The study revealed that impact of grazing on tuber crop production significantly (p <.05) depended on the tuber type (yam, cassava and potato), livestock type (cattle, goat and sheep), and location of the farmers in terms of state (Plateau). Also, the interaction between tuber type, livestock type and location had significant influence on the level of grazing on tuber crops in the study area. It was recommended that grazing reserves be provided for livestock farmers so that the incessant clashes between crop farmers and herders resulting from destruction of crops by livestock can be reduced.*

KEYWORDS*:* conflict, livestock, communal, grazing, herder

INTRODUCTION

In many parts of Africa, access to land and water is not only crucial to the survival of people that resides in the rural areas. It is also an important part of gross national products at the national level through livestock and agricultural products. However, land related conflicts have engulfed the rural areas of Nigeria with a complex and multi-faceted dynamic which change over the time depending on the geographical location that such conflict occurs (Conroy, 2014). For the herdsmen, there is no life without cattle, and they can go whatever mile to ensure that their source of livelihood is sustained (Odoh & Chigozie, 2012). These violent confrontations have often caused loss of lives, destruction of property, and degradation of the environment (Ehiabhi, 2012).

Conflicts between cattle herders and farmers have existed since the beginning of agriculture and have increased in intensity and frequency as a result of economic, environmental, and other factors. Increased herd sizes, for example, as a result of better cattle conditions, compelled cattle herders to look for pastures outside of their limited range. Climate change has posed a significant threat by increasing land pressures and thus causing conflicts between them (Abbas, 2012). Human health and population growth, on the other hand, have resulted in a much higher demand for land. Thus, fadama (riverine and valley-bottom) cultivation has increased significantly since the 1980s. This means that farmers and cattle herders have had to fight for access to such valuable lands, which frequently leads to increased conflict and violence (Abbas, 2012). These conflicts have put farmers' and cattle herders' means of survival and livelihoods in jeopardy, as well as what both groups are tenaciously protecting and projecting.

Perceived Factors Responsible for Herders-Farmers Conflict

Population Growth: Population growth has exacerbated the conflict. Many southern communities and farmers have been pitted against the Fulani. One cause is the growing population of Nigeria's cattle population, which has reached 25 million cows and is expected to reach 60 million by 2050. (Fabiyi & Otunuga, 2016). Massive amounts of food and water are required to feed massive numbers of animals while they travel across farmers' lands. Farmers accused Fulani herdsmen of failing to control their cattle and allowing them to wreak havoc on their crops. The Fulani herdsmen, on the other hand, accused farmers of stealing their cattle and sheep (Fabiyi & Otunuga, 2016).

Drought and Migration: Conflict is also exacerbated by climate change and environmental degradation. For decades, climate change has gradually altered Nigeria's landscape. Many parts of Northern Nigeria have become desert. Nigeria's rivers are at their lowest levels in years, and communities are suffering from drought (Fabiyi & Otunuga, 2016). Because they are fighting over diminishing resources, this situation has exacerbated conflicts between farmers and herdsmen.

Economic Factor: One hundred and fifty thousand dollars per individual. Fulani herdsmen play an important role in the Nigerian economy. They control more than 90% of the country's livestock population and roughly 3% of its GDP (Fabiyi & Otunuga, 2016). Nigerians rely on cattle for food, and the price of meat in some areas has steadily increased. The government must pay attention to this situation and find a way to alleviate the additional financial burden placed on the population as a result of rising meat and food prices (Ndubuisi, 2018). It necessitates the government spending significant funds to address the conflict by submitting a supplemental budget (Ndubuisi, 2018).

Poverty Factor: People's lives and livelihoods are directly affected by the conflict between Fulani and farmers. As a result of the conflict, there was widespread poverty and competition. Nigerians live in poverty in proportion to their population, with 70% living in poverty. Nigeria is Africa's most populous country, with over 250 ethnic groups (World Factbook, 2010). People in some areas, on the other hand, are impoverished and must relocate (Ndubuisi, 2018). These conflicts

have resulted in circles of extreme poverty and hunger, as well as increased violence, especially when either the farmer or the herdsmen are classified as belonging to a specific religion, tribe, or region (Mustapha & Ehrhardt, 2014).

Power Factor: When people lack adequate access to grazing lands and safe livestock routes, power dynamics between the two groups become more competitive. Any hierarchical socioeconomic structure that fails to meet people's basic material and cultural needs can cause structural violence (Rubenstein & Richard, 2017).

Resource Factor: Conflict would be more likely if there was competition for a scarce resource. One of the major causes of the fighting was the cattle herders' search for land and resources. Droughts and deserts have devoured up to 70% of grassland, and they are becoming more common. Because both parties have a vested interest, disagreements between herders and local farmers over the use and allocation of food and resources such as grazing areas are heated (Muhammed *et al.*, 2015). Moreover, police announced the arrest of suspected Fulani militants, alleging that they were armed with lethal weapons, and farmers accused herdsmen of destroying their crops and failing to control their animals. The herdsmen, on the other hand, believed that weapons were necessary to defend themselves from attacks by farming communities attempting to steal their cattle.

Territory Factor: Another major source of contention is the competition for land ownership. The Fulani consider themselves to be the legal owners of the land that has been leased to them or their parents. The Fulani reject those who see them as intruders on their grazing lands. Many farmers, on the other hand, see Fulani herders as strangers encroaching on indigenous peoples' land (Tonah *et al.*, 2017). In search of grazing land, Fulani cattle herders travel hundreds of miles. According to the Fulani, farmers frequently steal from their herds. They are frequently armed in order to protect their territory and livestock (Mikailu, 2016). Threatening retaliation in the hope of discouraging the other side from using weapons is one way to protect oneself. Both herders and farmers describe themselves as conflict victims. Land competition caused tensions between both parties over the years. Conflict resolution will aid both groups in establishing peace in the affected communities (Tonah *et al.*, 2017).

Security Factor: The conflict between herders and farmers was threatening regional security. As a result, the local authority's ability to enforce the groups' agreement is weakened. Thieves stole approximately 60,000 cattle in recent years, according to Nigerian reports. Many herders are forced to arm themselves in order to protect their cattle and homes. The conflict is regarded by the government as a threat to national security. Because violent actions have resulted in deteriorating living conditions, the conflict has become a threat to Nigeria's national security, and it will eventually lead to more conflicts and a breakdown of order in the region (Aliyu, 2015).

Objectives of the study

The broad objective of this study is to find out the perceived factors responsible for herders-farmers' communal conflict in Plateau State, Nigeria. The specific objectives are to:

i. describe the socio-economic characteristics of farmers in the study area;

ii. find out the livestock (cattle, goat and sheep) that farmers perceive as most destructive to tuber crops in the study area;
iii. determine if there are locational differences in impact of grazing livestock on tuber crops production.

Hypothesis of the Study
Ho: There is no significant locational difference in the impact of grazing livestock on tuber crops production in Plateau State, Nigeria.

THEORETICAL FRAMEWORK

The conflict theory

Different schools of thought characterize contemporary society, each analyzing social phenomena from its own perspective. The conflict theory is used in this study to explain herders-farmers conflicts in the study area. In its broadest sense, the term "conflict" encompasses the perception of difference and disagreement, strife and struggle. Gallo (2012) defined conflict perspective or conflict theory as a special type of system whose complexity stems from many different and sometimes unrelated elements. There are also parties involved in a conflict, whether the parties are two or many, with complicated relationships between them. More importantly, there are frequently multiple and diverse objectives, which may go unnoticed and evolve over time, until the conflict becomes intense. Conflicts in this study can arise between different groups within a country or in international conflicts. These are the types of conflicts studied in this study for better resolutions, such as the farmers and herders' conflict. However, each conflict does not arise in a vacuum, but in a context, whether local, regional, or international, a context that can change over time and has often unseen consequences for the conflict's structure and parties. Conflict does not end when attacks and violence cease or when the parties agree or sign an acceptable compromise. A conflict can be stopped in a real and stable way by establishing a lasting peace, which can be discouraging and difficult to achieve in some cases (Bartolucci & Gallo, 2010).

According to Pinzón and Midgley (2000), there is a need for a high level of theoretical analysis and practical decision making to stop a conflict, and their analysis of theoretical frameworks is used to evaluate conflict outcomes. Their analysis has practical implications, and the way they approach conflict is shaped by the criteria they use to evaluate its potential outcomes.

Through a detailed analysis, Pinzón and Midgley (2000) show how the framework that prevails in some areas of the conflict resolution literature, particularly in negotiation and mediation theory, is based on a reductionist and straightforward conceptual paradigm and gives rise to a new framework based on a systems approach. The study will attempt to explain how a systems approach is essential for a correct understanding of the features and dynamics of a conflict and its outcomes, as well as decisions made within the context of a conflict. Decisions without a systemic and real framework may worsen the conflict, resulting in amplified and prolonged consequences for the involved parties, and analysis may result in a deprived and misleading understanding of the conflict's dynamics and views. Conflict is a complex system that includes adaptive structures and

evolutionary mechanisms. It is a system made up of interconnected parts that exhibit various properties that can only be understood by dissecting and analyzing the properties of the various components. There are key components in system thinking such as state and activity variables, causal loops and feedbacks, multiple interconnected subsystems, and delays that hinder understanding of the distinct properties of a conflict. All of these elements, which are typical of a system structure, are present in conflicts and contribute to their existence.

All conflicts have characteristics in common. The first is that there is some sort of contact between the parties involved, the second is that the parties in conflict perceive opposing viewpoints, and finally, one of the parties always wants to resolve existing contradictions (Ofuoku & Isife, 2013). Conflict theory is useful in demonstrating that competition for access to natural resources between farmers and herders causes conflict. It establishes the context for the conflict's genesis in terms of access to means of production.

METHODOLOGY

Plateau State lies between latitude 9º 53 47.49"N and longitude 8º 51᾽29.99" E. The state covers an area of about 27,147 km^2 with a projected population of 4,707829. Female population, 2,360181 and male population, 2, 347648 in 2018 at 3.2% estimated growth rate from the 2006 population figure of 3,206531 (National Bureau of Statistics, 2016). The major stable crops grown in the area include cassava, yam, sweet potato, sorghum, maize, millet, onions, tomatoes, pepper, rice, groundnut, cowpea, etc. The population of the study consisted of smallholder farmers cultivating tuber crops (yam, cassava, and potato) in selected communities in the study area. The rationale for selecting the smallholder farmers was since they constitute the largest population producing tuber crops in the study area. Survey design was used for this study. Survey design is a sub-category of descriptive research. The design employs questionnaire and interviews to determine the opinion and perceptions of people about farmer's herders conflict. Questionnaire was used to collect data for the study.

The population of the study includes all small-scale farmers in the study area, a multi-stage sampling technique was adopted while questionnaires were used for data collection. The first stage involved the random selection of four (4) area councils (Abaji, Gwagwalada, Kuje, Kwali) in Abuja, out of six (6) councils in Abuja. The second stage involved the selection of eight (8) communities from each of the four selected area council. In the third stage, 48 farmers were selected from each of eight communities. The fourth stage involved the selection of five (5) farmers from each of the 60 selected communities. The final stage involved the selection of (5*60) =300 respondents from each of the sixty selected communities, giving a total of 1,200 respondents.

Questionnaire was administered to tuber crops farmers in the study area by the researchers with the help of well-trained ADP enumerators who were familiar with the locality. The questionnaire consists of four sections. Section A dealt with the socioeconomic characteristics of the tuber crop farmers in the study area. This includes age, gender, educational level, marital status, etc. Section

B contained questions on the level at which grazing cattle destroy tuber crops in the study area. Section C dealt with questions on the level at which grazing sheep destroy tuber crops in the study area and Section D dealt with questions on estimate of tuber crops destroyed by grazing livestock in the study area.

Data Analysis

The data collected from the field were analyzed with the computer software SPSS version 24.0. A three-way mixed analysis of variance (ANOVA) was used for the analysis, and it is expressed mathematically as:

$$\mathbf{Y_{ijkt} = \mu + S_i + T_j + L_t + ST_{ij} + SL_{it} + TL_{jt} + STL_{ijt} + e_{ijtk}} \text{ ……..…. 1}$$

Where:

Y_{ijtk} = Individual farmer's response on the impact of grazing livestock on tuber crops production.

- i denotes the level of factor S
- j denotes the level of factor T
- t denotes the level of factor L
- k denotes the kth observation in cell or treatment (ijt)

μ = population mean

S_i = impact as a result of differences in location (Abuja). This measures the main effect of state (location).

T_j = Tuber type - this measures the main effect of tuber type, i.e., impact due to the type of tuber crops cultivated (yam, cassava and potato)

L_t = Livestock type - this measures the main effect of livestock type, i.e., impact due to type of grazing livestock (cattle, goat, sheep)

ST_{ij} = interaction between state (location) and tuber type

SL_{it} = interaction between state (location) and livestock type

TL_{it} = interaction between tuber type and livestock type

STL_{ijt} = interaction of state (location), tuber type and livestock type

e_{ijtk} = error term

The model hypothesis that the impact of grazing livestock on tuber crops production depends on three factors - the location of the farmer in the north central Nigeria, type of grazing livestock and the type of tuber crop cultivated. Tuber type was measured repeatedly hence it is called "within factor variables". Tuber type has 3 levels (yam, cassava, cassava) while livestock type has three levels (cattle, goat, sheep). Location (a between factor variable) has 4 levels (Plateau, Abuja, Kwara, Nassrawa). By implication, the model states that the impact of grazing livestock on tuber crops production (Y_{ijtk}), depends on state in the north central zone (S_i), type of tuber crop cultivated (T_i), type of livestock reared (L_t), both state and type of tuber crop cultivated (ST_{ij}), both location and type of animal reared (LS_{it}), both livestock type and tuber crop (LT_{it}), and the interactive effect of state, livestock type and tuber type (STL_{ijt}). The μ is the population mean and the error term is given by e_{ijtk}. SPSS 24.0 was used to run the analysis and mean separation was done using Bonfenori model. It was tested at 5 percent probability level.

RESULT AND DISCUSSION

Socio economic characteristics of tuber crop farmers in the study area

Presented in Fig 1-7 are the results for the socio-economic characteristics of tuber crop farmers in the study area.

Gender: The result revealed that most (61.2%) of the farmers were male while the remaining 38.8% were female. This revealed that the majority of the tuber crop farmers in the study area were male. Kimaro *et al.*, (2015) stated that due to the physical demands of agriculture, more men are involved in agricultural activities than women. In contrast, Dayo *et al.*, (2009) opined that the higher percentage of men being sampled for studies does not necessarily mean that there were fewer women than men in agricultural activities, rather it outlines the difficult researchers face in accessing women farmers for data collection, due to religious and cultural inhibitions.

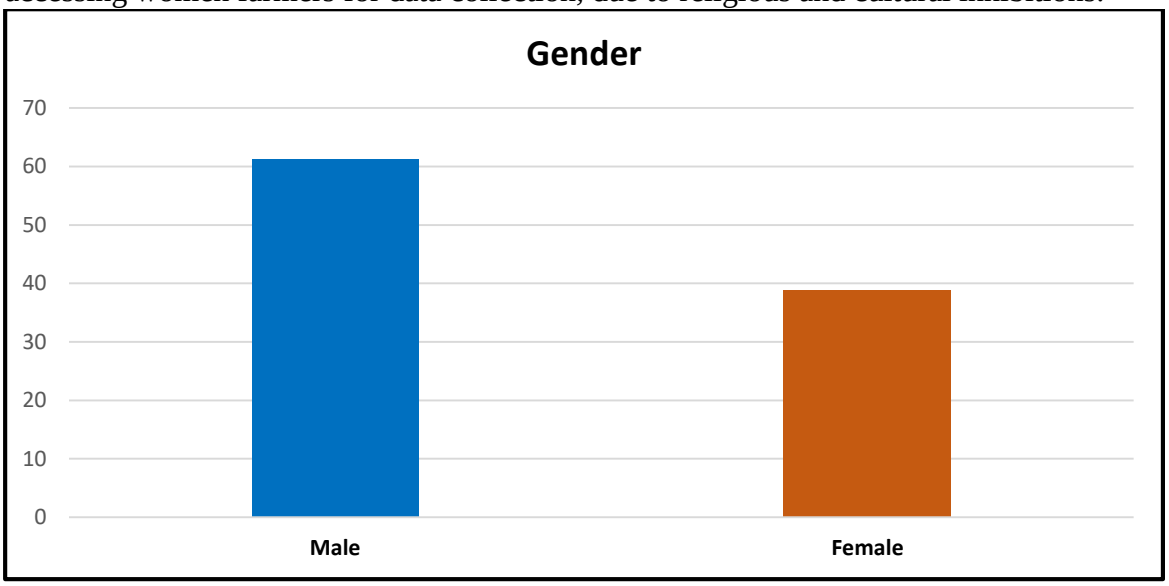

Figure 1.1: Gender distribution of the farmers in the study area

Marital status: The result further showed that 81.6% of the farmers were married, 12.3% were single while the 6.1% were either widowed or divorced. The implication of this is that it is rare to see rural farmers who are not married, due to the high rate of polygamy among rural dwellers. In addition, marriage is considered as one of the most important moral value among the rural dwellers because there is an increase in life expectations and the believe that partnership can result to high survival at mid age and later age (Robards *et al*, 2012).

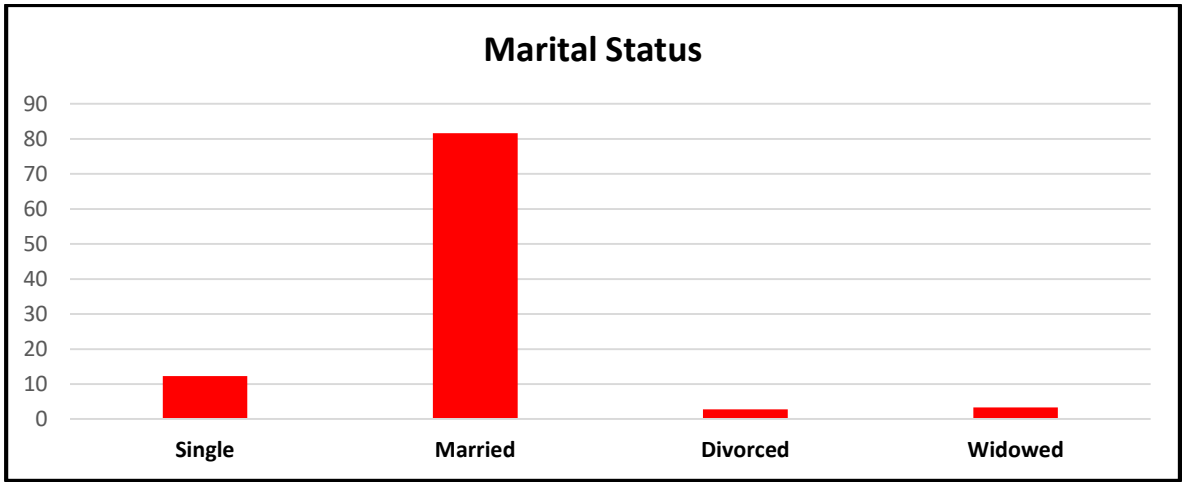

Figure 1.2: Marital status of the farmers in the study area

Household size: The household distribution of the farmers in Table 4.1 revealed that majority (49.9%) of the respondents had a household size of 6-10 persons, 27.2% had a household size of 1-5 while only 11.15% of them had a household size of 11-15. Okoye (2009) stated that farmers with large household are likely to have higher outputs per hectare than those with smaller households. Consequently, household size is among the essential socio-economic characteristics which influence agricultural productivity of the farmers because a fairly large family size suggests that more family labour available for the household farm activities.

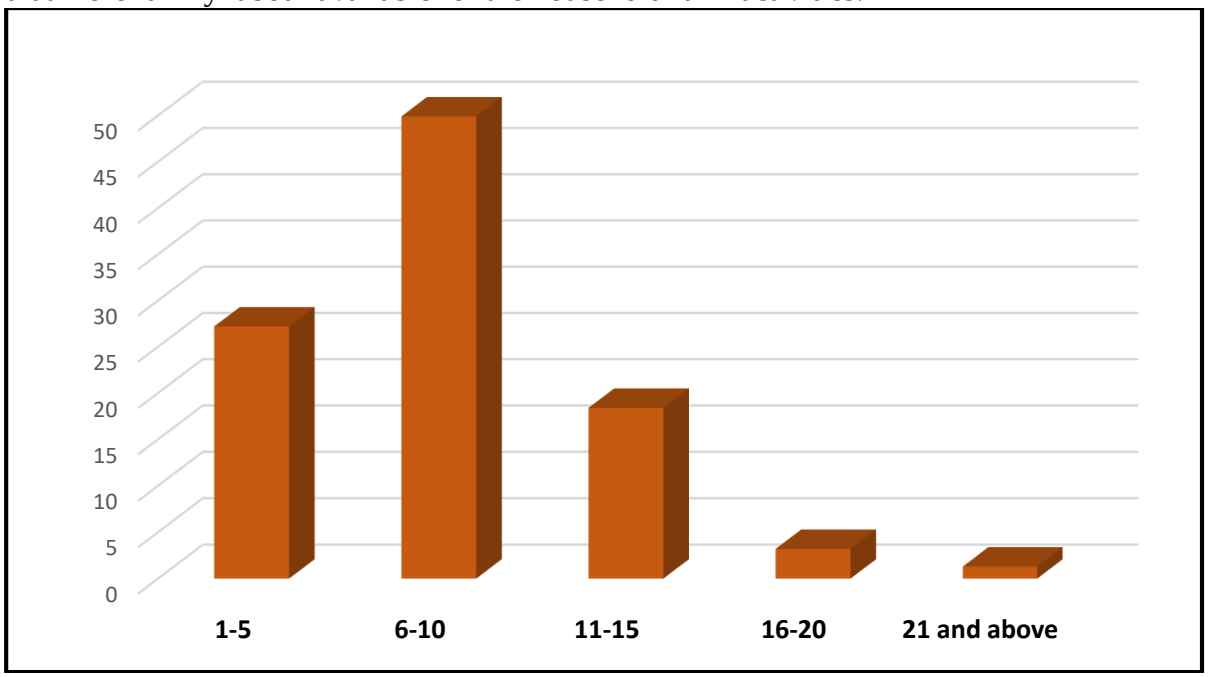

Figure 1.3: Household size of the farmers in the study area

Age: Age has a crucial role to play in the farming activities and production process. It is

measurable in terms of number of years of the farmers. The results also revealed that 37.6% of the respondents were within the age bracket of 41-50 years, 29.1% were within 31-40 years of age, while 16.0% were between the ages of 21 and 30. Age can significantly affect the level of a farmer's productivity and this result implies that majority of the farmers were still within the productive active age and can efficiently participate in farming activities.

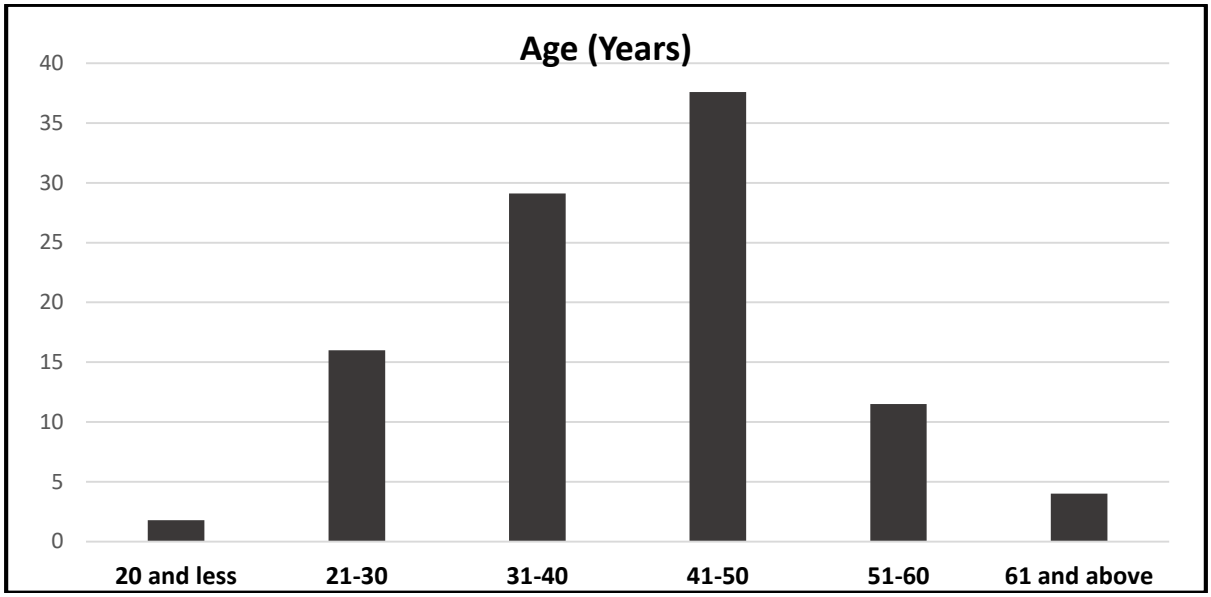

Figure 1.4: Age distribution of the farmers in the study area

Farming Experience: Most (45.7%) of the respondents had been involved in agriculture for 11 to 20 years, 20.0% of the respondents had a farming experience ranging from 21 to 30 years, while about 17.0% had a farming experience between 1 and 10 years. It is expected that experienced farmers will possess the ability to make the right decisions as it involves the allocation of productive resources (Dossah & Mohammed, 2016).

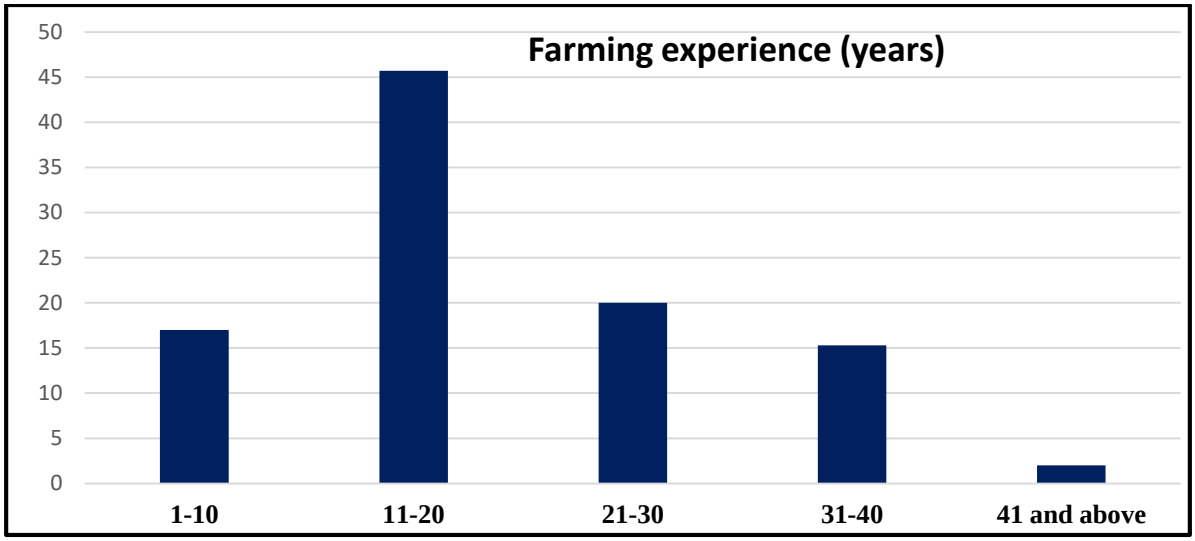

Figure 1.5: Farming experience of the farmers in the study area

Educational qualification: The result for the level of educational of the tuber crop farmers revealed that most (65.1%) of them had a secondary school education, 28.0% had tertiary school education while 21.5% had primary school education. Only 19.4% of the respondents did not have any form of formal education. It is believed that farmers with formal educational qualification will possess the ability to properly allocate resources for maximum productivity.

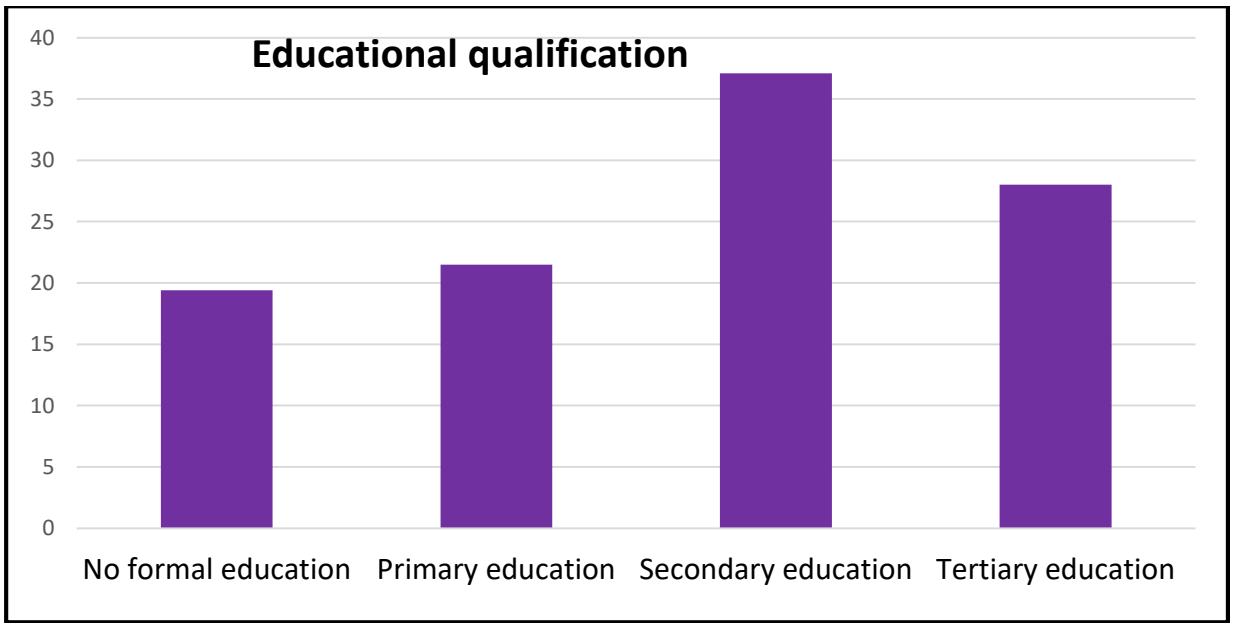

Figure 1.6: Educational qualification distribution of the farmers in the study area

Farm Size: The result for the farm size of the respondents revealed that most (39.5%) had a farm size of 1-3 hectares, 33.4% of the respondents had a farm size of 4-6 hectares, while 27.1% of the

farmers had 7 hectares of farmland.

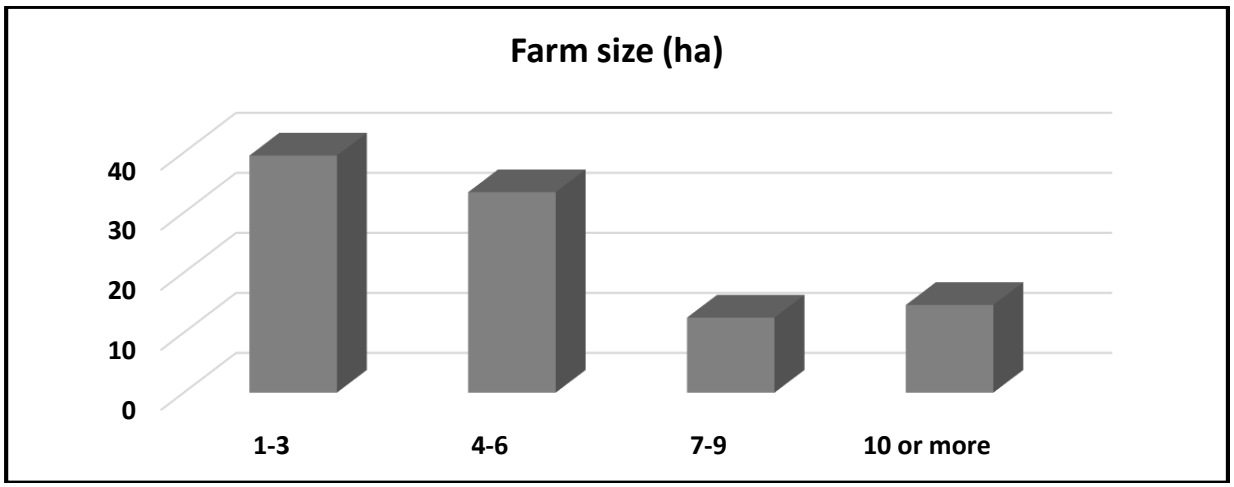

Figure 1.6: Gender distribution of the farmers in the study area

Livestock that farmers perceive as most destructive to tuber crops

Figure 1.7 shows the result for the livestock which farmers perceived as most destructive to tuber crops in the study area. The result shows that cattle, with a mean response of 2.07, were the most destructive livestock to tuber crops in the study area. This score is significantly ($p < 0.5$) higher than sheep (1.78) and goat (1.71). Also, the result revealed that the second most destructive grazing livestock were sheep (1.78) while goats (1.71) were the least destructive livestock to tuber crops in the study area. This implies that goats is the least destructive animal. Ajah (2012) posited that the seriousness of the impact of cattle on crop production was significantly higher than other livestock like goat and sheep.

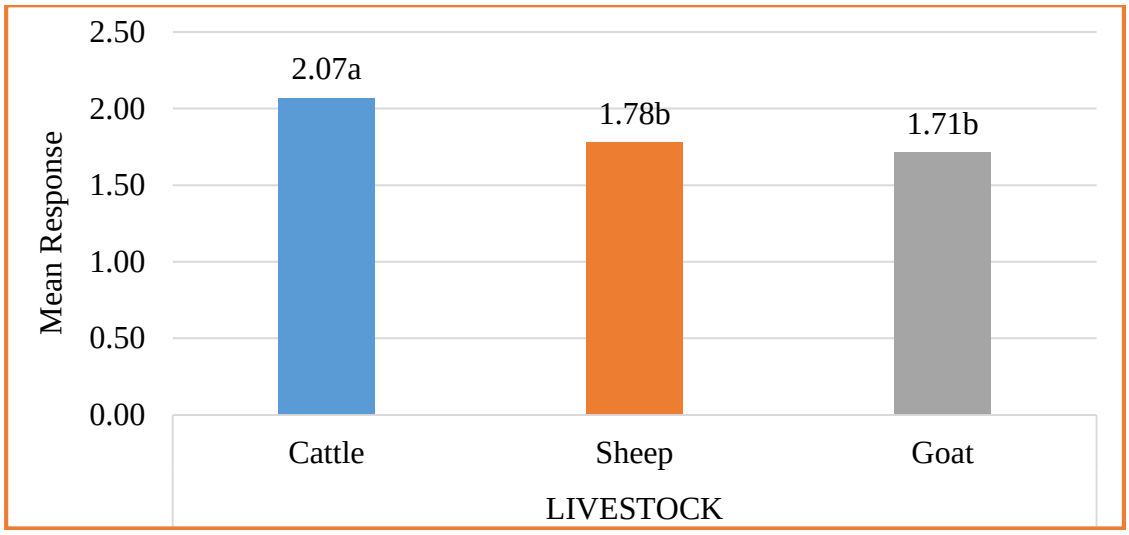

Figure 1.7: Farmers rating showing most disastrous livestock on tuber production (pooled data)
Note: Means (bars) with the same alphabet did not significantly differ from each other
Source: computed from field data

Locational differences in impact of grazing livestock on tuber crops

The results in Table 1.1 shows the three-way mixed analysis of variance (ANOVA) done to determine the impact of grazing livestock on tuber crops production. The results indicated that impact of grazing on tuber crop production significantly ($p < .05$) depended on the tuber type (yam, cassava and potato), livestock type (cattle, goat and sheep), and location of the small-scale farmers in terms of state (Plateau State). The result also reveals that impact of grazing significantly depended on the interaction effects between the tuber type and location (state), livestock type and tuber type, and between livestock type and location. Also, the interaction between tuber type, livestock type and location had significant influence on the level of grazing on tuber crops in the study area. Based on the results, mean separation was carried out to determine the mean responses that were significantly different from each other. This study disagreed with the findings of Adisa and Adekunle (2012) which indicated that there was no significant locational difference in impact of grazing on crop production. It however agrees with Ajah (2012) who found out that there was significant locational difference in the impact of grazing of crop production because the perceptions of the farmers differ from one another.

The tuber type row shows the impact of tuber type on the level of grazing livestock on tuber crop. The result, F (2, 7176) = 268.91, p = 0.00, indicated that the impact of grazing livestock significantly depended on the tuber type (preferred by the livestock).

The location row shows the effect of location on grazing tuber crops. The result, f (3, 7176) = 1036.00, p = 0.00, show that there was a significant ($p < .05$) relationship between grazing of tuber crops and the location (state). It tests the hypothesis which states that there is no significant locational difference in the impact of grazing livestock on tuber crops production. The livestock type row shows the impact of grazing livestock on tuber crop. The result, F (2, 7176) = 63.48, p = 0.00, indicated that level of severity of grazing livestock significantly depended on the livestock type.

The tuber type*location row of the ANOVA table shows the interaction effects of tuber type and location of the farmer. The result, F(6,7176) 131.85, p = .00, showed that there was significant ((p < .0) interaction effect between tuber type and the location of the farmer. The interaction effect between livestock type and location is revealed in Table 4.2. The result F(4,7176) = 8.33, p = .00 shows that there was significant interaction effect between livestock type and location (state). Furthermore, there was significant ($p < .0$) interaction effect between livestock type and tuber type as indicated by the result F(4. 7176) = 8.33. p= .00. In the interaction between tuber type, location and livestock type in Table 4.2. The result, F (12, 7176) 5.49, p = .00, showed that there was a significant ($p < .05$) interaction effect between tuber type, livestock type and location (state).

Table 1.1: ANOVA results of the impact of grazing livestock on tuber crops production

Sources of variation	Df	SS	MS	F-Cal	*P*-value
Tuber type	2	398.84	199.42	268.91	.00
Tuber type∗State (location)	6	586.69	97.78	131.85	.00
Livestock type∗Tuber type	4	24.72	6.181	8.33	.00
State∗livestock type∗Tuber type	12	48.81	4.07	5.49	.00
Error (within factor)	7176	5321.60	0.74		
State (location)	3	6293.08	2097.69	1036.00	.00
Livestock type	2	257.07	128.54	63.48	.00
Livestock type∗State	6	113.69	18.95	9.36	.00
Error (between factor)	3588	7265.05	2.03		

***Source**: Computed from field data, 2021.*

CONCLUSION

Crop cultivation and livestock production under semi-intensive or extensive systems in Nigeria are not mutually exclusive because both require the use of land resources, which are not readily available. Crop farmers and herders have to compete for the available land which usually results in frequent clashes which have claimed the lives of many while also resulting in the destruction of properties. Both animal husbandry and crop production are vital to maintaining food security and economic growth, hence it is not possible to stop either of them. It was therefore imperative to examine the impact of grazing livestock on tuber crops production. The livestock considered for the study include cattle, sheep and goat, while the tuber crops were yam, cassava and potato. Based on the findings of the study, we conclude that cassava is more prone to damage by livestock while cattle are the most destructive livestock in the study area.

Also, the level of damage caused by livestock on tuber crops within the study area is dependent on location (state). The impact of grazing livestock on tuber crops is significantly higher in Plateau State, than other states used for the study. Cassava farmers incurred significantly higher financial losses from grazing operations than other tuber crop farmers in the study area.

Recommendations

Based on the findings, the following recommendations are made.

1. Grazing reserves should be provided for livestock farmers so that the incessant clashes between crop farmers and herders resulting from destruction of crops by livestock can be reduced. A peaceful co-existence between these different groups will ensure that both crop farmers and

herders can carry out their production activities without fear. Also, this will ensure that damages caused by grazing animals is stopped or reduced.

2. Extension workers should ensure that livestock farmers should be sensitized and encouraged to adopt intensive system of animal production.

3. Farmers or herders who incite violence should be properly dealt with in accordance with the law. This will serve as a caution to others who may want to engage in similar acts.

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