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Effects of Farmers-Herders Clashes on the Supply and Demand of Foodstuffs: A Case Study of Selected States in Nigeria

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ABSTRACT

The study examined the effects of farmers-herders clashes on foodstuffs supply and demand in Nigeria with special reference to Oyo, Benue, and Ebonyi States in Nigeria. The institutional and environmental factors influencing the clashes, associated effects on foodstuffs supply and demand, and the relevance of management options including modern cattle ranching were explored with the use of the descriptive research approach. The study employed well-structured questionnaire to collect data from 582 farmers in villages across the States. Findings of the study indicated that the farmers-herders clashes involving conflicts over land, water resources, and grazing continue to have significant effect on foodstuffs supply and demand in Nigeria. These have affected agricultural activities and the overall food production system in Nigeria. Addressing these clashes requires a holistic and multi-faceted approach that involves collaboration among government agencies, local communities, civil society organisations, and international partner through careful planning, community engagement, and focus on sustainability to ensure long-term benefits for both food production and economic development. The study therefore recommends Government active adoption of a bottom-top approach to policy decisions that facilitate dialogue and mediation between farmers and herders through engagement of community leaders, religious figures, and local authorities to hold the clashes at bay and sustainably increase foodstuffs supply and demand in Nigeria.

Keywords: Foodstuffs, Clashes, Herders, Farmers. Demands, Supply, Nigeria

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1. INTRODUCTION

The Food and Agriculture Organization (FAO) of the United Nations (UN) mentioned the four pillars of food security as access, availability, utilisation and stability which continue to dominate in policy contexts over the years (Clapp, Moseley, Burlingame & Termine, 2022). The UN has also recognised the right to food in the Declaration of Human Rights in 1948 and has since noted that it is important for the enjoyment of all other rights (D'Odorico, Carr, Davis, Dell'Angelo & Seekell, 2019).

It is therefore important to evaluate the implications of agricultural development and trade on the right of human to food (D'Odorico *et al.*, 2019). Agricultural production provides the means of livelihood and economic sustenance for majority of the Nigerian population as farmers and herders make significant contributions to meeting the nutritional needs of the country and thus contributing to food security of households (Onuoha & Ezirim, 2015). The supply and demand of foodstuffs to individuals and households at national, regional and global levels is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs for active and healthy life (Pérez-Escamilla, 2017). This indicates that there is food insecurity when people do not have adequate physical and economic access to food for which reason agricultural commodity prices and issues with armed conflicts need to be understood and addressed from a household food security perspective.

Extant literature indicates that countries struggling with conflict and violence tend to have it difficult reducing the number of people suffering from hunger and food insecurity (George, Adelaja & Weatherspoon, 2020). In the Sahelian African region, resource use conflicts between farmers and herders have been on the increase in most countries due to rapid population growth and the escalating effects of climate change (Nnaji, Ma, Ratna & Renwick, 2022). In the case of Nigeria, clashes between farmers and herders historically exists, but recent rising population and climate change have led to cultivation of more land hitherto meant for grazing and cattle routes. It is vital to note that these clashes have impact on the supply and demand of food in the locality and the country at large. The conflicts disrupt and threaten the peaceful coexistence of different ethnic groups and sustainability of agricultural production in Nigeria (Imo, 2017).

Although the Nigerian government, some mediating agents and organizations have responded in a bid to solve these conflicts, their efforts have been considered unsuccessful as the Government's response to the violence revolves round the use of military force and mediation by eminent persons at a crisis point (Udosen, 2021). In most cases where military forces were deployed to address the conflicts, incidents were often aggravated, especially in the treatment of the civilian population, which itself has become a critical political and security challenge. Farmers-herders conflict therefore continues in several parts of Nigeria resulting in the destruction of many lives and properties. The conflict occurs when nomadic herders graze their animals, in most cases cattle, in the cropland of farmers leading to yield and income losses for farmers where farmers sometimes retaliating by maiming the cattle or forcing herders out of their communities and herders fighting back in response (Nnaji *et al.*, 2022). According to Udosen (2021) the North-central states of Benue, Plateau and Nasarawa and other states in the south and middle-belt, have experienced conflicts that led to thousands of deaths and displacement farmers and herders.

Nigeria has witnessed and continues to witness series of farmers-herders clashes, majority occurring within the predominantly agrarian Northern Nigeria and parts of the South (Bello & Abdullahi, 2021). The States most affected in these areas include Benue, Plateau, Nasarawa, Niger, Kogi, Oyo, and Ebonyi among others where food crops production is threatened, resulting in widespread incidence of hunger and malnutrition (Adesote & Peters, 2015; Yahaya & Bello, 2020; Udosen, 2021). Udosen (2021) posited that the conflict persists in almost every part of Nigeria threatening the means of survival and livelihood of both farmers and herders with the potential of increasing insecurity and food crisis.

The farmers-herders conflict has been attributed to policy gap and underdevelopment of grazing lands, land ownership and land use system, increased demand for food to feed the rising population, climate change, induced competition for resources, changing resource access rights, inadequacy of grazing resources, poverty, insurgency, armed robbery, corruption, economic sabotage and environmental degradation (Adeoye, 2017; Udosen, 2021). Crop farmers tend to accuse the herders of allowing their cattle to destroy farmlands without payment of compensation for the losses and damages done to crops, while cattle herders on the other hand also accuse crop farmers of cultivating on their stock routes and grazing reserves. Many empirical studies examining the effects conflicts on food security focus on the effect on the nutritional status of children, household consumption patterns, crop and livestock portfolios, calorie, intake, and investment decisions of farmers (George *et al.*, 2020). Against this background, this paper examines the increased level of clashes between farmers and herders in Nigeria, the dynamics associated with the conflict and the impacts on the supply and demand of food in the country with special focus on selected States in Nigeria.

1.1 Statement of the problem

The series of farmers and herders' clashes spanning over decades have economic, political, social, and environmental dimensions affecting every area and sector of Nigeria at different times (Ojelade, 2019). The farmers and herders' conflicts have become one of the major challenges facing Nigerians especially in agrarian communities. The crisis continues to hamper national security and development due to the increased operation which has deviated the attention of the government on some key areas of the economy. The clashes have not only become a great predicament for the society but also mars human relations. In recent times, the frequency of farmers and herders' conflict has left adverse effects on foodstuffs supply and demand as well as socio-economic development of people (Ajibefun, 2018).

The farmers and Fulani herders' clashes have gloomy effect on lives, properties, and foodstuff supply and demand in Nigeria (Ajibefun, 2018; Udosen, 2021). Although quantitative evaluation of the effect the conflict in Nigeria is almost non-existent (Ajibefun, 2018), it is noted that besides the loss of lives, it has contributed enormously to the devastation of arable farmland and valuable properties worth several billions of Naira. The overall implication for sustainable development is that farming, economic and educational activities worsen day by day to the extent of farming coming to halt in some parts of Nigeria. Some farmers also find it difficult to attend to their crops hence not getting enough food crops for markets, leading to increase in commodities prices in the market.

Recent extant studies conducted on farmers-herders clashes in Nigeria across various disciplines have emphasised on issues of socio-economic development, displacements and migration, food security, nutritional challenges, and investment decisions of farmers (Amusan, Abegunde & Akinyemi, 2017; Egbuta, 2018; Ikhuoso *et al.*, 2020; Yahaya & Bello, 2020; Madu & Nwankwo, 2021). Some extant literatures have linked the farmers-herders with poverty (Awotokun, Nwozor & Olanrewaju, 2020). Nevertheless, extant studies have not fully explored the effects of farmers-herders clashes along with the constraints on supply and demand of food in Nigeria. Moreover, studies have given little attention on household food demand on a national level in the efforts to understand and improve the food security situation in Nigreria (Salman, Salawu, Salawu & Osawe, 2021).

There is therefore, the need for examining the dynamics of the increasing farmers-herders clashes with the effects on foodstuff supply and demand. This paper addresses this deficit by mainstreaming a rationale for exploring the dynamics of farmers-herders clashes in relation to the supply and demand of food. This paper therefore examines the dynamics of farmers-herders clashes and associated effects on supply and demand of food in Nigeria, with special reference to selected States in Nigeria including the Oyo State, Benue State, and Ebonyi State.

1.2 Objectives of the study

The main objective of the study was to examine the effects of farmers-herders clashes on the supply and demand of foodstuffs in Nigeria, with reference to some selected states.
The specific objectives are to;

i. examine the socio-economic characteristics, institutional and environmental factors influencing farmers-herders clashes in Nigeria;
ii. examine the effects of farmers-herders clashes on the supply and demand of foodstuff in Nigeria; and
iii. to assess the relationship between modern cattle ranching options and the supply of foodstuff in Nigeria.

1.3 Research questions

The following research questions were used in the study;

i. What are the socio-economic and environmental factors influencing farmers-herders clashes in Nigeria.
ii. How does the farmers-herders clashes affect the supply and demand of foodstuffs in Nigeria.
iii. What relationship exists between modern cattle ranching and the supply of foodstuffs in Nigeria.

2. LITERATURE REVIEW

2.1 Overview of the farmers-herders clashes in Nigeria

Farmers-herders clashes remain a complex occurrence as it points to a larger picture of struggles for survival between two important stakeholders in the agricultural sector of Africa (Kugbega & Aboagye, 2021). In Nigeria, the clashes result from encroachment of farmlands by the Fulani herders who own over 90% of the livestock in Nigeria which accounts for one-third of agricultural gross domestic product (GDP) and in most cases, settle in fertile areas to rear their cattle (Ajibefun, 2018). The farmers are persons engaged in agriculture, especially in crop farming and Fulani Herders persons belonging to the Fula tribe who watches over a herd of cow, sheep or goat (Omokhoa & Okuchukwu, 2018).

According to Sambo and Sule (2020) farmers-herders clashes is not new in Nigerian history and this conflict has been in existence for many years. The clashes have spread since 1970s after the Nigerian government discovered oil in commercial quantity leading to the gradual and persistent neglect of agriculture and exacerbated after the return of democracy in 1999 due to politicisation of the clashes (Sambo & Sule, 2020; Udosen, 2021).

The farmers-herders clashes remain one of the sensitive issues generating a lot of tension in Nigeria these days has the capacity of marring the unity of Nigeria (Nwachukwu, Ajaero, Ugwuoke & Odikpo, 2021). Climate change continues to confront the herders and they further migrate southwards in search of pasture for their cattle (Omokhoa & Okuchukwu, 2018; Nnaji *et al.*, 2022). Farmlands and crops are destroyed in the process and this engenders conflict between the herders and farmers. When conflicts ensue, the herders tend to overpower the farmers in most instances because they were well armed and ready to kill without compunction leaving several North Central and Southern communities in Nigeria in ruins (Nwachukwu *et al.*, 2021). Basically, the clashes in Nigeria have been the problem of access to land for economic survival, which has resulted in economic, political and environmental tensions in the country especially in the Middle Belt and South of Nigeria (Udosen, 2021).

Besides the environmental challenges which proximately engender farmers-herders clashes, studies have indicated some significant issues that that combine to escalate the clashes over the past two decades (Egbuta, 2018; Bello & Abdullahi, 2021). According to Egbuta (2018) one major cause for the escalating intensity of the clashes has been the increasing proliferation of small arms and light weapons in Nigeria which tend to give herders upper hand over the farmers. Bello and Abdullahi (2021) indicated the destruction of farmlands as a contributing factor where the migrating herders move southwards in dry season to seek for greener pastures for their cattle. There are obvious cases of policy gap and underdevelopment of grazing lands, land ownership system and land use, rising demand for food to feed the growing population, induced competition for resources, poverty, insurgency, armed robbery, corruption, economic sabotage, and lack of commitment of government at all levels to address the conflicting claims between farmers and herders which contribute to the protracted farmers-herders clashes (Fasona, Fabusoro, Sodiya, Adebayo & Olufemi, 2016; Egbuta, 2018; Ajibefun, 2018).

According to Egbuta (2018) clashes are rife along farmlands located within the riverbanks due to the constant movement of herders in such areas. Resource use disagreements thus affect the allocation of food crops farmlands and grazing areas and the conflict becomes more intense (Ismaila and Umar, 2015) amid the expected increase in cattle population Nigeria. Ranching has been identified as better alternative for the herders not only to improve animal production but also manage and promote enduring solution to the farmers-herders clashes ((Udosen, 2021; Nwachukwu *et al.*, 2021) since only approximately one-third of the 417 grazing reserves which were officially demarcated for grazing since 1965 are in use (Sambo & Sule, 2020) and the remaining converted to other purposes. The grazing reserves have not been supported adequately (Egbuta, 2018), poorly managed (Imo, 2017), and some grazing reserves have been converted to university campuses and airports hence reducing the chances of herders of accessing the reserves.

Ranching is the practice of raising herds of animals on large tracts of land and has been a common practice in temperate dry areas. It is a common practice in the Pampas region of South America, the western United States, the Prairie Provinces of Canada and the Australian Outback. Ranching is appropriate for ensuring that livestock are in the right place, at the right time and with the right behaviour (Schareika, Brown & Moritz, 2021). It therefore embraces innovation and following best practices that improve efficiency and conserve land, water and other resources while producing excellent products for the demand of consumers.

2.2 Foodstuffs supply and demand in Nigeria

Studies show more than 800 million persons worldwide, especially in developing countries do not have enough food to meet their basic nutritional needs (Omotesho, Adewumi, Muhammad-Lawal & Ayinde, 2016). Food supply has substantially increased in the developed countries resulting from advancement in technology (Matemilola, 2017). Nevertheless, constraints on access to food and continuing inadequacy of household and national incomes to purchase food, instability of supply and demand, and natural and man-made disasters prevent basic food needs from being fulfilled in many countries (Omotesho *et al.*, 2016). Food demand has been rapidly increasing and changing in its composition over the past three decades in West Africa like many other regions in the world (Zhou & Staatz, 2016). According to Matemilola (2017) food is the most basic of all human survival needs but food insecurity remains prevalent in Nigeria in spite of the several efforts that have sunk in improving the quality and production of food supplies.

The availability of food plays noticeable role in food security due to the fact that having enough food in a country is significant but not satisfactory to ensure people have reasonable access to food (Metu, Okeyika & Maduka, 2016). The fast-rising population over the years than food supply has resulted in food unavailability in certain areas. Moreover, the production food crops still rely heavily on climate and weather conditions in Nigeria (Matemilola, 2017). According to Metu *et al.* (2016) the ability to have access to food is conditioned by economic access and physical access, where the former depends on the income in individual, the price of food and the purchasing power of persons and the latter depends on the availability and quality of infrastructure needed for the production and distribution of foodstuffs. The increasing rate of poverty therefore result in lack of economic access to foodstuffs (Metu *et al.*, 2016; Perez-Escamilla, 2017; Adeoye, 2017). The rural areas have become more susceptible to malnutrition, erratic supply of foodstuffs, unaffordable food costs, low quality foods and occasionally complete lack of food and these situations are more rampant in many parts of northern Nigeria (Matemilola, 2017).

Northern Nigeria has traditionally been the food production basket of Nigeria and accounts for approximately 70 percent of agricultural activity but internal conflicts have caused cessation of farming in affected areas (Mobolade, Bunindro, Sahoo & Rajashekar, 2019; Madu & Nwankwo, 2021). The region has suffered massive displacement of its farming population in recent times. Farmers produce rice which is a key Nigerian staple alongside maize, palm oil, and beef but these are grossly insufficient to meet domestic demand, hence the need for imports (Maziya-Dixon *et al*., 2021). According to Kah (2017) the farmers are no longer able to produce in sufficient quantities to meet the foodstuff demand from other parts of Nigeria hence there is imminent severe food crisis in various parts of the country, partly due to the costly clashes, the transformation of agricultural lands for other uses, climate change, agricultural soil degradation, water scarcity, poor governance, growing demand and changes in consumption patterns, uncontrolled deforestation, and export-oriented agricultural development policies. Studies indicated that population and income growth, changes in lifestyles associated with globalisation and rapid urbanisation appear to be major drivers of changing foodstuffs demand not only in Nigeria but also in the West African subregion (Zhou & Staatz, 2016; Omotesho *et al*., 2016).

Nigeria is experiencing food deficit with high levels of undernourishment and food vulnerability (Matemilola, 2017; Ngcamu & Chari, 2020). The country has an energy intake of 1730Kcal and an average protein supply of 64g capita per day far below the 2500-3400Kcal minimum recommended daily intake per day, indicating that the country is facing the challenge of unbalanced diet leading to various deficiency symptoms (Metu *et al*., 2016). Food production index of Nigeria increased from 21.7 index in 1972 to 108.1 index in 2021 growing at an average annual rate of 3.48% (Ngcamu & Chari, 2020) but not sufficient to match the pressure from the increasing population. The pattern of food nutrient supply in Nigeria indicated that an average Nigerian's food calorie (energy) consumption increased from 2091.50 calorie/caput/day in 1980 to 2418.40 cal/caput/day in 1990 and to 2725 cal/cap/day in 2002, with aggregate protein consumption also increasing from 48.5g /cap/day in 1980 to 56.2g /caput/day in 1990 and 61.1g per caput/day in 2002 making the imbalance between food demand and supply obviously creating a huge gap between food availability and requirement with an enormous challenge on the national food security (Salman *et al.*, 2021).

The demand for foodstuff from the population in Nigeria has become greater than the supply from the agricultural production due to the inconsistency of government policies, environmental degradation and unsustainable agricultural production (Metu *et al* 2016). Foodstuff demand refers to the quantity of food people buy at various prices, at a given time and place and with the growing incomes, shifting rural-urban populations and changing preferences of people over the years, domestic consumer demand for foodstuff in Nigeria has been on the increase (Salman *et al.*, 2021). Nigeria is one of the most urbanised countries in West Africa with 53 percent of the population living in urban areas and one of the most rapidly urbanising areas of the world (Zhou & Staatz, 2016). Increasing incomes in poorer countries are reported to have also increased food demand, thereby diminishing global food reserves (Chowdhury, Moore, Weatherley & Arora, 2017; Salman *et al.*, 2021). In addition, food preferences are changing from grains and other staple crops to vegetables, fruits, meat and dairy because as purchasing power increase among most consumers, they respond by shifting to more expensive and western forms of nutrients (Harris, Chisanga, Drimie & Kennedy, 2019; Salman *et al*., 2021).

3 METHODOLOGY

3.1 Research design and approach

The survey design was more suitable for this study. This is because with this design a large amount of data can be collected simultaneously, obtaining information is systematic and unbiased, and surveys are efficient as many variables can be measured without substantially increasing the time or cost. With the mixed approach, both qualitative and quantitative research methods were employed for this study due to its composite nature, which no single approach could satisfactorily deal with all the essential methodological aspects. This allowed for testing and validating already constructed models about how the farmers-herders clashes affect supply and demand of foodstuffs, generalising the research findings, and quick data collection that makes the research results independent of the researcher and with higher credibility. Data for the study was collected from both secondary and primary sources. The former comprised information from published and unpublished sources including journals, textbooks, periodicals, government publications, reports and official documents to support the latter which was based on administration and distribution of structured questionnaire.

3.2 The study area

The study was conducted in three (3) selected predominant farming States of Nigeria comprising the Oyo State, Benue State, and Ebonyi State. The major economic activity of all the states is agriculture, engaged in by majority of the population. The population for this study comprised of all farmers in these States. Oyo State is an inland state in southwestern Nigeria with landscape consisting of old hard rocks and dome shaped hills which rise gently from about 500m to 1,200m. The climate is equatorial comprising dry and wet seasons with relatively high humidity and average daily temperature ranges between 25°C and 35°C. Benue State lies within the lower river Benue trough in the middle belt region of Nigeria on a generally low lying and gently undulating land. The area has a tropical wet and dry or savanna climate with yearly temperature 29.38°C and receives approximately 135.2mm of rainfall annually. Ebonyi State is located in the south-east geopolitical zone of Nigeria, divided between the Cross-Niger transition forests in the far south and the drier Guinean forest-savanna mosaic in the rest of the state. The State has a humid tropical climate with one rainy season and one dry season. Temperature typically ranges from 20°C to 38°C during the dry season and from 16°C to 28°C during the rainy season. The region receives average annual rainfall of 2500mm. Table 1 and Figure 1 summarise the demographic characteristics and location of the study districts.

Table 1- Description of selected States

S/N	State Name	Land size (km^2)	Local Government Area	Population	Agricultural population	Major food crops Cultivated
1	Oyo	28,454	33	7,512,855	70%	Maize, yam, cassava, millet, rice, plantains, cocoa, palm produce, cashew
2	Benue	34,059	23	5,787,706	70%	Yam, Cassava, Sweet potato, Beans, Maize, Millet, Guinea corn, Vegetables
3	Ebonyi	6,400	13	3,007,155	85%	Rice, yam, potatoes, maize, beans, and cassava

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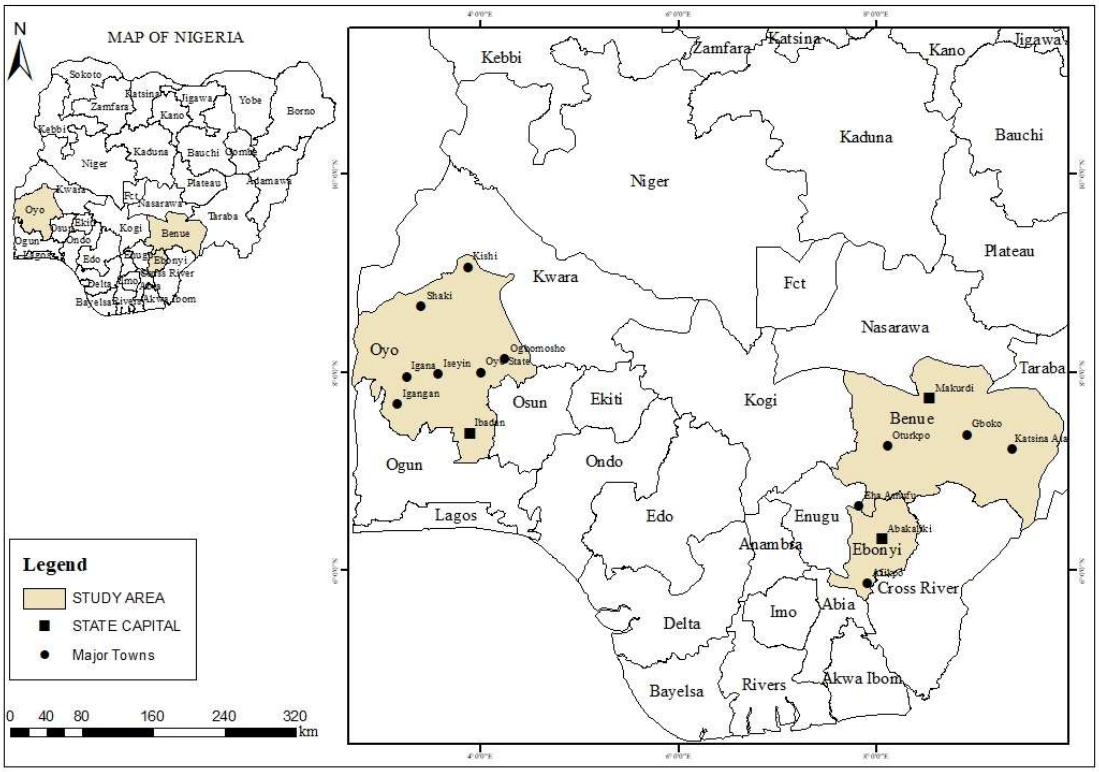

Figure 1: Map of Nigeria showing location of the Study Area

3.3 Sampling technique

The study used a three-stage random sampling technique to select the sample. The first stage involved a random selection of the Local Government Area (LGA) with predominant agricultural activity in the State. The second stage involved a random selection of ten villages from the list of villages in the LGA. The third stage involved a random selection of farmers in each of the selected villages. From a total of six hundred (600) farmers sampled across the three (3) States, data obtained from five hundred and eighty-two (582) were found useful for this analysis.

3.4 Data collection instrument

Both primary and secondary data were collected. Primary data was collected by the use of a well-structured questionnaire for the study participants. Interviews were held with study participants with the use of the structured questionnaire. Data was collected from all farmers of the sample who have lived in the respective State for six months and above. All farmers who lived in the respective villages for less than six months were excluded. Leaders from farmers associations were also interviewed for in-depth information.

3.5 Statistical analysis

The data collected was analysed using the Statistical Package for Social Science (SPSS) 27.0 version software. Both descriptive and inferential statistics were used for the analysis with the former employing the use of percentages for the analysis of socio-demographic variables and the latter being used to test the study hypotheses. When error occurs, cleaning was done to re-check and make sure the data was coded and entered correctly. The data then was electronically cleaned and ready for analysis for the outcome of the study.

4 RESULTS AND DISCUSSION

4.1 Demographic characteristics

In the three (3) States where the study was conducted, responses of the famers indicated they were delighted to participate in the study and the responses were positive. The demographic characteristics of the farmers in the study area are presented in Table 2. Majority of the respondents (59.45%) were male. This corresponds with the findings of Oseni, Corral, Goldstein and Winters (2015) who indicated that men dominate the agricultural sector in Nigeria with higher average technical and allocative efficiency than women who also participate across the agriculture value chain, engaging in production, processing, and sales. This is an indication there were more males than female farmers in agricultural production. Almost half (41.75%) of the respondents were within the age range of 31 and 40 years having overall mean of 31.8. This shows farmers in the study area were very youthful and economically active to effectively engage in agricultural activities with expectation of profitable yield. According to Onyekuru, Ihemezie and Chima (2019) younger people are more productive than the elderly since they are more energetic, adjust faster, and adopt new technologies easily. Moreover, modern agricultural activities in Nigeria are basically practiced in small-scale requiring significant latent energy and capacity by farmers to execute most of the activities (Akpan, Patrick, James & Agom, 2015).

In addition, the majority (43.13%) of the farmers were married and about 51.27% of the farmers were Christians. According to Tuki (2023) Christians are more concerned about the farmers-herders conflict than Muslims because the farmers are often from various ethnic groups and predominantly Christian while the herders are primarily Fulani, an ethnic group that is largely Muslim. Approximately 47% of the farmers who were engaged for the study indicated they had no formal education. This means majority of the farmers have had some level of education ranging from SSCE to tertiary and it is an indication that farmers could afford to read, write and be able to process information that can help them minimise the conflict and improve production.

Table 2- Demographic Characteristics of Respondents

Variables	Frequency	Percentage
Sex		
Male	346	59.45
Female	236	40.55
Age		
20-30 years	147	25.26
31-40 years	243	41.75
41-50 years	131	22.51
50 years-above	61	10.48
Marital Status		
Single	109	18.73
Married	251	43.13
Separated	58	9.97
Divorced	48	8.25
Widow/Widower	116	19.93
Religion		
Christianity	299	51.37
Islam	283	48.63
Educational Qualification		
SSCE	176	30.24
OND/HND	70	12.03
Bsc-above	62	10.65
None	274	47.08

4.2 The farmers-herders clashes

The farmers-herders clashes in Nigeria is an ongoing conflict between agricultural farmers and nomadic herders basically Fulani herders over land and resources. The clashes continue to be a longstanding in Nigeria and are often driven by combination of factors across the States. These include the struggle for water and grazing land, ethnic and religious differences, scarcity of resources, political and governance manipulation and weaknesses, as well as, climate change. Considering the institutional and environmental factors influencing farmers-herders clashes in this study, responses of farmers indicated environmental factors, climate change, access to land, and uncontrolled activity of the herders as major contributory factors (Table 3).

A considerable number of study participants 65% were with the agreement that environmental factors such as desertification, land degradation, and resource scarcity are the major factors influencing farmers-herders clashes in Nigeria. Thus, 256 farmers agreed and 127 farmers strongly agreed that environmental factors are the major factors influencing farmers-herders clashes in Nigeria. This is reflective of earlier studies that the major factors influencing the farmers-herders clashes in Nigeria are changing climate conditions, longstanding disagreements, and scarcity of fresh water, and 75% of these factors are climate change related issues such as desertification, droughts, erosion and floods (Nwodim, 2020).

Table 3- Factors influencing farmers-herders clashes in Nigeria

S/N	QUERY	SA	A	U	D	SD
1	Environmental factors are the major factors influencing farmers-herders clashes	127	256	36	77	86
2	Climate change contribute to the clashes between farmers and herders in your State.	233	128	56	104	61
3	Conflicts between farmers and herders can be understood as a problem of access to land	153	191	47	96	95
4	Activities of herdsmen are the major cause of the farmers-herders conflict in your State	247	76	104	47	108

Similarly, majority (65%) of farmers indicated that climate change contributes to the clashes between farmers and herders in across that States considered for this study. This means that 233 farmers strongly agreed and 128 agreed to this assertion. The responses indicated that climate change has contributed to changing weather patterns, altered rainfall, and increased temperatures in the States. This also contributes to droughts situations, reduced water availability, and desertification, which makes it more problematic for both farmers and herders to sustain their livelihoods. As water and grazing land become scarcer, clashes will arise over access to these resources. Of course, access to water and grazing land have become more competitive and has resulted in regular violent clashes between farmers and herdsmen in recent times (Oli, Ibekwe & Nwankwo, 2018).

One other factor the study identified as a factor influencing the farmers-herders clashes is the problem with access to land. Majority (59%) of the farmers indicated that the clashes can be understood as a problem of access to land. That is 191 farmers agreed and 153 farmers strongly agreed that the clashes between the farmers and herders could be well understood from the perspectives of access to land. As the population of Nigeria grows, there is increasing pressure on available land for both farming and grazing which leads to conflicts over land ownership and use. Ducrotoy *et al.* (2018) posited in earlier studies that high population is increasing pressure on grazing reserves contributing to herders migrating in search for grazing fields, hence clashes with farmers over land use.

Furthermore, famers indicated that the activity of herdsmen is in itself a contributory factor to the herders-farmers clashes. Majority (55%) of the farmers asserted that the activities of herdsmen are the major cause of the farmers-herders conflict in the States. Thus, 247 farmers responded that they strongly agree the activities of the herders engender the clashes, 76 agree, 108 strongly disagree, 47 disagree, and 104 were undecided. This indicates the activities of herders are regarded a significant factor influencing farmers-herders clashes in Nigeria. The clashes with settled famers often result from the interactions and behaviours of the herders themselves. Some of the key activities of the herders that contribute to these clashes include open grazing, crop destruction, livestock theft, grazing on protected lands, use of firearms, disregard for boundaries, and unregulated movement. The findings of Ciboh (2017) revealed that unregulated grazing is common cause of destruction of food crops and constant friction between herders and farmers of host communities. Nevertheless, it is worthy to note that not all the herders are possibly engaging in these activities because some herders are victims sometimes of these clashes as studies have indicated that the youth among the farmers sometimes engaged in raping and harassing the women of herders and as well connive with outsiders to steal their cattle (Bello & Abdullahi, 2021).

4.3 Effects of the clashes on foodstuff supply and demand

The farmers-herders clashes in Nigeria have had significant effects on the foodstuff supply and demand in the country. For instance, findings of the British Department for International Development (BDID) funded humanitarian organisation, Mercy Corps in 2013 and 2016 indicated that the perennial farmers-herders clashes in Nigeria have affected foodstuffs supply and demand, causing approximately USD14 billion loss in three years (Nnaji *et al*., 2022). These clashes primarily involve settled farmers and nomadic herders over access to land, water resources, and grazing areas. The clashes often result in violence, displacement, and destruction of property, which in turn impact agricultural activities and food production.

The responses of farmers in the study have highlighted the concerns of farmers on the implications of the farmers-herders clashes on the supply and demand of foodstuffs (Table 4). Majority (84%) of the farmers disagree to the assertion that conflict between herdsmen and farmers has enhanced food supply and employment in the States as 362 farmers strongly disagree and 124 farmers disagree. Similarly, 85% of the farmers disagree the farmers-herders clashes in Nigeria has improved socio-economic development as 312 farmers strongly disagree and 184 farmers disagree. These indicate that the clashes have resulted in reduction of foodstuff supply and employment and have worsen the socio-economic development of the people. Since the clashes result in the displacement of farmers and destruction of farmlands, agricultural activities are disrupted leading to reduced crop yields and harvests, impacting the supply of various food crops. The livelihood of both the farmers and herders are disrupted, contributing to economic instability for the affected communities especially, affecting their purchasing power and demand for food. Majority (89%) of the farmers therefore agreed with the statement, "The conflicts between farmers and herders in your State has posed a serious threat to food supply and demand" as 326 farmers strongly agreed and 191 farmers agreed.

Table 4- Effects of farmers-herders clashes on foodstuff supply and demand

S/N	STATEMENTS	SA	A	U	D	SD
1	Conflict between herdsmen and farmers has enhanced food supply and employment.	10	21	65	124	362
2	Farmers-herders conflict in Nigeria has improved socio-economic development	22	36	28	184	312
3	The conflicts between farmers and herders in your State has posed a serious threat to food supply and demand	326	191	10	30	25
4	The activities of herdsmen have enhanced the economic, political and social safety of your State.	56	63	24	156	283
5	Farmers-herders conflicts affect the quantity of food supply in your State.	258	169	50	66	39
6	The farmers-herders conflict has improved the quality of the social relationship between farmers and herdsmen.	41	39	40	183	279
7	Farmers-herders conflict has led to the reduction of total output and food supply in your State.	107	64	15	126	270
8	Farmers and herders' clashes do not have an effect on the supply and demand of food.	18	12	8	100	444
9	Farmers-herders clashes will increase the supply and demand of food.	32	22	31	139	358

The study responses indicate the farmers-herders clashes in Nigeria have contributed to foodstuff and demand problems, disruption food production, and led to higher food prices. The findings of Fadare, Akerele, Mavrotas and Ogunniyi (2019) indicated that the clashes induce food price shocks which results from decrease in agricultural production and market disruption leading to higher transactions costs. The activities of herders and associated clashes has not only affected agricultural production but have also become the most potent threat to national security in the last couple of years due to the frequency, the level of destruction and sheer brutality that results from the clashes (Obi & Chukwuemeka, 2018).

Responses of the farmers in this study indicated that majority (75%) disagreed that the activities of herdsmen have enhanced the economic, political and social safety of the States. Also, the assertion of 73% of farmers indicated that farmers-herders conflicts affect the quantity of food supply in respective States. Majority (79%) of farmers disagreed with the query, "

The farmers-herders conflict has improved the quality of the social relationship between farmers and herdsmen". However, 68% were of the assertion that farmers-herders conflict has not led to the reduction of total output and food supply in the States. This indicates other conditions contribute to the total output and food supply. For instance, studies show over 2000 tons of yam and 2500 tons of vegetable crops are lost annually as a result of to decay in Nigeria and the perceived damages associated with yam spoilage made the Benue State government to construct a 200,000-tuber capacity yam storage facility in Zaki Biam, though the storage facility was insufficient for Benue State which accounts for approximately 70% of total yam production in Nigeria (Ani, Anyika & Mutambara, 2022).

Nevertheless, effect of the farmers-herders clashes continues to pose a major challenge to foodstuffs supply and demand (Vande, 2022). Responses of farmers in the study indicated that almost all farmers (95%) disagreed with the assertion that farmers and herders' clashes do not have effect on the supply and demand of food. A majority 85% also disagreed that farmers-herders clashes will increase the supply and demand of food.

These indicated that as food production decreases due to the clashes, scarcity of certain food items occurs, leading to higher prices in the market and making basic foodstuffs less affordable for consumers, particularly those with lower income level. Table 5 shows the Consumer Price Index (CPI) of selected foodstuffs between May 2022 and May 2023 as reported by the National Bureau of Statistics an indication that major foodstuffs are increasingly become less affordable to consumers.

Table 5- Consumer price index for selected foodstuffs

S/N	Foodstuff	May-22 Mean (Naira)	May-23 Mean (Niara)	Annual Mean Increase	Highest	Lowest
1	Beans brown, sold loose	536.91	629.75	17.29	Ebonyi (965.91)	Niger (452.42)
2	Beans: white black eye. sold loose	524.70	599.74	14.30	Ebonyi (880.00)	Benue (428.20)
3	Beef Bone in	1,522.75	1,914.92	25.75	Ogun (2383.35)	Osun (1588.10)
4	Beef, boneless	2,029.59	2,520.52	24.19	Imo (3475.04)	Kogi (1790.14)
5	Broken Rice (Ofada)	515.04	612.05	18.84	Lagos (948.92)	Benue (430.00)
6	Gari white, sold loose	326.85	371.42	13.64	Enugu (499.58)	Kwara (268.55)
7	Gari yellow, sold loose	344.69	401.59	16.51	Imo (535.48)	Kwara (285.48)
8	Groundnut oil: 1 bottle, specify bottle	1,040.88	1,330.35	27.81	Ebonyi (2202.34)	Kogi (773.33)
9	Maize grain white sold loose	314.75	350.82	11.46	Rivers (551.76)	Kano (255.48)
10	Maize grain yellow sold loose	312.51	359.52	15.04	Bayelsa (610.74)	Kebbi (244.51)
11	Onion bulb	387.53	453.86	17.12	Cross River (960.82)	Katsina (334.21)
12	Palm oil: 1 bottle	847.39	1,109.17	30.89	Zamfara (1297.67)	Kwara (780.19)
13	Plantain(ripe)	315.84	425.79	34.81	Imo (750.20)	Taraba (220.00)
14	Plantain(unripe)	292.00	386.74	32.44	Rivers (610.14)	Taraba (225.00)
15	Rice agric. sold loose	507.18	640.36	26.26	Rivers (1016.55)	Kebbi (433.94)
16	Rice local sold loose	447.51	555.18	24.06	Ondo (724.81)	Jigawa (369.09)
17	Rice Medium Grained	496.98	615.32	23.81	Bayelsa (889.88)	Kogi (470.00)
18	Rice, imported high quality sold loose	619.64	793.01	27.98	Rivers (1134.30)	Plateau (600.08)
19	Sweet potato	234.69	297.35	26.70	Akwa Ibom (498.40)	Benue (180.72)
20	Tomato	423.48	498.34	17.68	Edo (957.95)	Kogi (215.43)
21	Yam tuber	372.23	457.25	22.84	Akwa Ibom (924.17)	Benue (214.79)

4.4 Management options for foodstuffs supply

The issues surrounding herders-farmers clashes are complex and multifaceted, involving a mix of socioeconomic, cultural, and environmental factors. Addressing these clashes requires comprehensive strategies that involve not only regulating the activities of herders but also promoting alternative livestock management methods, developing grazing reserves, improving conflict resolution mechanisms, and fostering dialogue between herders and farming communities. Although, the management of farmers-herders disputes in Nigeria is unclear except for the effort of some governors prohibiting open grazing of cattle in the south and central belt (Usman & Eyo, 2022) managing the farmers-herders clashes in Nigeria is crucial for ensuring a stable foodstuff supply and promoting peace between both the farmers and herders.

The study responses have identified some management options that farmers indicated would contribute to sustainable foodstuffs supply and promote peaceful coexistence not only in the respective States but also in Nigeria as a whole (Table 6). Majority (68%) of the farmers indicated on agreement that establishment of grazing reserves is a management option for the farmers-herders clashes as 265 farmers strongly agreed and 128 farmers agreed to the statement. Grazing reserves are designated areas of land where herders can graze their livestock in a controlled and organised manner. Studies have indicated that pre-colonial Nigeria allocated grazing reserves for livestock development to encourage sedentary lifestyle of nomadic herders and to reduce land resource use conflicts between farmers and herders but the existing grazing reserves and routes have been marginalised and neglected by the emerging States that derive their power from the land use Act of 1978 coupled with the adaptation of the Federal System of government of modern Nigeria (Tari & Jonah, 2022). Grazing reserves would provide a solution that balances the needs of both the farmers and herders by providing designated spaces for grazing while minimising conflicts over access to farmland and water resources.

Table 6- Management options for foodstuffs supply and demand

S/N	STATEMENTS	SA	A	U	D	SD
1	Establishment of grazing reserves is a management option of the farmers-herders clash.	265	128	54	68	67
2	Introduction of feed preservation and storage techniques will help reduce the need for seasonal migration of livestock.	275	142	53	50	62
3	Providing a proper database for cattle owners in the State can reduce the farmers-herders conflict.	70	69	68	194	181
4	Ranching is a management option of the farmers-herders clash.	372	143	17	21	29
5	Security arrangements for herders and farming communities will encourage management of the farmers-herders' conflicts.	100	182	76	78	96
6	The purpose of ranching is centred on the increase of food production.	187	178	45	79	93
7	A cordial relationship between herders and farmers will increase food production.	226	179	38	78	61
8	Government intervention through modern ranching will reduce possibility of famine.	251	170	38	58	65
9	The supply of foodstuff in the State can be improved through the improper management of animals.	71	58	40	141	272
10	Ranching will reduce the damage caused to farm crops.	384	134	6	26	32

In addition, majority (72%) of the farmers agreed with the assertion that the introduction of feed preservation and storage techniques will help reduce the need for seasonal migration of livestock. One of the options for ensuring sustainable foodstuffs supply is providing cattle with quality feed to augment dry season forages through concentrates or supplemental feeding but the this comes with high cost and limited availability of supplements, making this less affordable for smallholders (Rao, Gopinath, Prasad & Singh, 2016). Majority (65%) of the farmers also disagreed that providing a proper database for cattle owners in the States can reduce the farmers-herders conflict.

Majority (88%) of the farmers agreed that ranching is a management option for the farmers-herders clashes. Promoting the establishment of livestock ranches or designated grazing areas and provision of support and incentives for herders to transition from nomadic herding to ranching to would prevent conflicts over open grazing. Studies show that up to 40 ranchers can share same facility that government will provide at a reduced rate for larger project cattle colonies since ranching in Nigeria is more of an individual venture for herders and those wishing to invest in the livestock sector (Tari & Jonah, 2022). Other management options farmers agreed were relevant for reducing the farmers-herders clashes and sustaining foodstuffs supply and demand include providing security arrangements for herders and farming communities, encouraging cordial relationship between herders and farmers, government intervention through modern ranching, and proper management of animals.

The farmers strongly envisaged enhanced ranching will reduce the damage animals cause to farm crops. Modern cattle ranching options are therefore significant for improving foodstuffs supply in Nigeria, especially considering the context of farmers-herders clashes and the associated effects on agricultural productivity. These improved livestock management, reduced conflicts, increased meat production, land management, diversification of livelihoods, infrastructure development, and environmental impact such as proper waste management, land use planning, and sustainable practices. Modern ranching options therefore, have the potential to positively influence the supply of foodstuffs in Nigeria by improving livestock management, reducing conflicts, increasing meat production, and promoting sustainable land use.

5 CONCLUSION AND RECOMMENDATIONS

The foregoing discussions reveals that the farmers-herders clashes have had significant effect on foodstuffs supply and demand in Nigeria. These clashes basically involving disputes over land, water resources, and grazing areas have led to violence, displacement, and destruction of property, all of which affect agricultural activities and the overall food production system in Nigeria. The clashes have contributed to decreased food production, livestock losses, internal displacement and food insecurity, disrupted supply chains, rising food prices, reduced investment in agriculture, and loss of livelihoods. Addressing these clashes is crucial for stabilising foodstuff supply and demand in Nigeria. This requires a holistic and multi-faceted approach that involves collaboration among government agencies, local communities, civil society organisations, and international partners. Implementing of the various management options would help ensure more peaceful coexistence between farmers and herders and ultimately benefiting foodstuffs supply and demand in Nigeria. Nevertheless, successful implementation requires careful planning, community engagement, and focus on sustainability to ensure long-term benefits for both food production and economic development.

Lack of physical records on foodstuffs supply and demand is a major limitation to this study. Date collected on farmers-herders clashes and associated effect on foodstuffs supply and demand were based largely on memory recalls of farmers which are subject to bias on the part of the respondents. The study did not consider the effects of the clashes from the perspectives of herders who also constitute part of the food chain did resource constraints for this study. To this end, to ensure peaceful coexistence between the two land users, the study recommends that Government should adopt a bottom-top approach to policy decisions that facilitate dialogue and mediation between herders and farmers through engaging community leaders, religious figures, and local authorities. Government should also encourage and invest in livestock ranching and modernisation to encourage the transition from open grazing to ranching and provide support and training for modern livestock management practices.

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