Farmer-Herder Conflicts and Food Security Dynamics in West Mamprusi Municipality of the North East Region, Ghana

David Suaka Yaro, Ph D
University of Technology and Applied Sciences, Centre for Peace and Conflict Studies, Ghana, ORCID: 0009-0006-8220-1720.

Corresponding Author: David Suaka Yaro, Ph D.

Abstract

Farmer-herder conflicts have increasingly become a major challenge in West Mamprusi Municipality, with significant consequences for food security. In the West Mamprusi Municipality, competition over farmland and water resources has generated tensions, economic losses, and reduced agricultural harvest. Theories guiding the study are social identity theory, and social capital theory. The study used mixed-method design merging quantitative and qualitative approaches. Data were collected from 351 respondents through questionnaires and interview guides. Findings revealed that although herder activities provide some benefits such as income generation and access to animal protein, they also contribute to serious disruptions in food production. Major challenges identified include farmland destruction by cattle, erratic rainfall, and increased indebtedness among farmers who often lost their investments due to crop damage. Consequently, some farmers abandoned commercial farming for subsistence farming and alternative livelihoods like charcoal burning, undermining local food security. The study recommends that the West Mamprusi Municipal Assembly collaborate with stakeholders to create grazing reserves, establish structured conflict resolution mechanisms.

Keywords: West Mamprusi Municipality, Herders-Farmers Conflicts, Human Security, Resource Scarcity, Food Security

Introduction and Background

Food security, understood as sustained way to adequate, harmless, and healthy food (FAO, 1996), remains a major global concern. Across sub-Saharan Africa, farmer-herder conflicts increasingly disrupt agricultural systems, reducing food availability and threatening rural livelihoods (Yaqoob, Muhammad, Kabir and Adeola 2022 and Mensah, 2014). These challenges are further intensified by climate variability, population growth, and weak governance structures, which heighten competition over land and water resources (Dos, Adams, Neville, Wada, de Sherbinin, Mullin, et al, 2017 and Deressa, 2016).

Historically, interactions between farmers and herders shifted between cooperation and conflict. In recent decades, however, rising pressure on scarce resources has tilted these relations toward recurrent disputes, often resulting in crop destruction, livestock losses, displacement, and heightened food insecurity (Idris & Adamu, 2021 and Bukari et al., 2020). Also, Abosede and

Fatma, (2024), opined that heightened competition can escalate tensions, limit access to essential farming resources, and ultimately threaten food security. Nnaji et al. (2023) further stated that these conflicts disrupt agricultural activities and pose risks to sustainable food production.

These dynamics are evident in the North East and northern regions as well. From Atanga, and Tankpa, (2021), West Mamprusi Municipality, is found within the North East Region, and is dependent on rain-fed agriculture. The rainfall patterns are inconsistent and intensifying farmer-herder rigidities that weaken food production. The incursion of Fulbes herders since the 1980s has deepened suspicion with resident in the communities, habitually intensifying into fierce clashes, contamination of water sources and destruction of farmlands (Agyemang, 2019; Agyemang,2017 and Abubakari et al., 2020).

According to Osumanu et al., (2012) notwithstanding government and the various community intercessions designed to encouraging peaceful cohabitation. Disputes persist leading to unresolved and mistrust among them. Earlier studies show immediate impacts of these conflicts, and limited reconnoiter examines their long-term consequences for food security. The fundamental objective of this manuscript is to explore farmer-herder happenings and their stimulus on food security dynamics in West Mamprusi, contributing to insights in the region.

Pertinent issues related to the study

The manuscript investigates farmer-herder conflicts and food security in West Mamprusi Municipality using social identity theory, which describes intergroup relations, and social capital theory. These theories highlight collaboration and trust. Relevant empirical issues are also presented to examine how these dynamics silhouette food security consequences in North East region of Ghana.

Theoretical Review

Social identity theory

Turner, & Reynolds, (2001) and Brown, (2000) stated that Social Identity Theory, propounded by Tajfel and Turner (1986), shows how members of a group form commonality through joint values, customs, and cultural practices while differentiating themselves from other groups. In West Mamprusi Municipality, this theory is pertinent for understanding farmer-herder relations. Farmers recognize stalwartly with their backgrounds, linguistic, and principles, while Fulbe herders uphold dissimilar norms ingrained in cattle rearing and Islam. These characteristics often produce pigeonholes, where an individual actions are generalized to the full group for instance, connecting all herders' destruction of crop and farmers with cattle rustling. These biases lead to conflict, undermining cooperation and mistrust, ultimately threatening the food security. Correcting these undesirable conflicts, is therefore important to reducing stiffnesses and enlightening farmer-herder relations in West Mamprusi municipality of the North East region.

Social capital theory

Balijepally (2004), also explain social capital theory as a concept that underscores the importance of social associations and systems as a resource for individuals and administrations. It is a multidimensional concept, encompassing elements such as social networks, civic engagement, norms of reciprocity, and trust (Akanbang and Kulisaana, 2022). The theory is particularly relevant in the context of comparative politics and public policy, where it has been shown to correlate with

desirable features of liberal democracy and improved public policy outcomes (Paraskevopoulos, 2010). Bourdieu (2011) defined social capital as a group's summative properties linked to a shared web of varied interpersonal affairs. The system highlights the societal assembly where the personalities' function. These include features, the situation, and the possible assistances accessible to the persons in the systems (Fine 2010 and Ihlen, 2005). The concept of social capital is still evolving, with ongoing debates about its theoretical underpinnings and practical applications (Lin, 2017 and Bourdieu, 2011). This may be functioning secretly and openly with one representative or a minor group of go-betweens assigned and asked to represent the group, to say and perform in its designation. The social capital theory will help the researcher to investigate the special relationship between Fulbe herders, the middle-persons, the paramount chief, sub-chiefs, politicians, security persons within the district, the department of agriculture and how this relationship is held together by mutual economic gains both in cash or in kind in the West Mamprusi Municipality.

Farmer-Herder Activities and Food Security Dynamics

Farmer-herder conflicts have been shown to significantly affect food security through disruptions in production, access, use, and stability. Studies reveal that these disputes reduce food availability by limiting agricultural labor, discouraging production decisions, and lowering yields (Blattman & Miguel, 2010; Adelaja & George, 2019; George et al., 2021). Conflicts also destroy critical infrastructure such as roads, markets, and farms, undermining food access (Brück, d'Errico,. Yaro, Kipo-Sunyehzi, & Titigah ,2024 and Pietrelli,2019 and Kah, 2017). Beyond production and access, disputes negatively influence food utilization, with anthropometric studies showing worsening nutritional outcomes in conflict-prone areas (Martin-Shields & Stojetz, 2019; Akresh et al., 2012). Also, conflicts heighten price volatility and increase reliance on food imports, further weakening food stability (George et al., 2020). Yakubu et al., 2021 and Nnaji et al., 2022 stated that research from Nigeria underscores the scale of the challenge. Findings indicate that farmer-herder conflicts result in increased food insecurity, crop losses, displacement, and widespread hunger among both farmers and herders. Owolabi et al., (2016) studies expressed strong relationship between conflicts and food insufficiency, while some disclose that both groups experience reasonable hunger during prolonged disputes. These results indicate the wider effects of farmer-herder disputes for livelihoods, family nutrition, and survival for a longer period of time (Olanrewaju & Balana, 2023 and Sule,2020).

According to Antwi, 2018, Effah-Abedi, 2014 and Dary et al., 2017, comparable outlines are insincere in Ghana. In regions such as Upper West, North East, Upper East and Easting region of Ghana, farmer-herder conflicts are linked to violence, cattle rustling, crop destruction, and community fragmentation. These outcomes directly reduce food supplies, increase poverty, and deepen mistrust between groups. Although interventions such as mediation committees, ranching policies, and grazing reserves have been attempted, several times but persist due to limited stakeholder engagement, corruption, and weak governance, (Moritz, 2010). Due to that, food security remains friable, predominantly in places dependent on sole natural rain for agriculture.

In West Mamprusi Municipality, these dynamics are about the dependence on farming as the sole livelihood (Akudugu et al., 2014). Agyemang, (2019) and Abubakari et al., (2020) exhibited that the demolition of crops, land conflicts, and social suspicion between farmers and Fulbe herders weaken the firmness of food structures in the area. Illustration acumens from both West African and Ghana practices, this manuscript emphasizes that farmer-herder relations are multi-stage, fashioned by governance, economic, cultural and, social factors. These dynamics are important for making policies and stratagems that can diminish conflicts, leading to food suffient, and the protection food security in North East region of Ghana.

Empirical Review

Cultural Dynamics in Farmer-Herder Disputes

literature discloses the intricate and complicated nature of farmer-herder connections and their consequences for food security. Ukamaka (2017) and Vanger (2020) opined how edifying customs, traditional authorities and land usage practices, structures form farmer-herder kindred, repeatedly powering disagreements. Bukari (2017) underscores identity associated differences, which worsen rigidities, while Turner (2006) attributed more positive view, linking to the role of organisations in conflict resolution. These perceptions emphasise the want to recognize educational influences in connecting farmer-herder dynamics in West Mamprusi Municipality.

Avruch (2019), also argues that norms, beliefs and cultural values, shape social responses to disputes, signifying that farmer-herder clashes must be synchronised in the interior cultural background. Lenshie and Jacob (2020), demonstrate how gender roles impact relations, observing that Fulbe herders might circumvent conflict with female farmers but willingly engage male farmers in ferocious clashes. Although their conclusions offer intuition into fighting dynamics, they lack explanation of how deeper cultural pigeonholes, religion differences, values, norms, and nationality make conflicts persist.

Bosch (2017), shows how Tiv and Fulbes in Nigeria, reveals how contrary cultural insights of cattle and crops heighten disputes. For Fulbe herders, cattle embody wealth, heritage, and identity, while Tiv farmers view farmlands and crops as symbols of labour, wealth, and social responsibility (Yaro, & Tobias,2019 and Jimoh et al. 2023). These contrasting values complicate dispute resolution. However, Bosch does not fully explore how cultural differences become entrenched, making conflicts more intractable. The manuscript addresses these gaps by examining how cultural differences particularly in norms, values, religion, and social identity shape farmer-herder activities and food security outcomes in West Mamprusi Municipality.

METHODOLOGY

Study Area

West Mamprusi Municipality is among the six (6) Municipalities in the North East Region, Walewale being the capital. The largest tribal groups coexist pleasantly with the minor groups (Builsa, Frafra, Kasena, and Dagomba) (Tonah, 2002). Religiously, made Islam is the dominant followed by Christianity and Traditionalists the least (Ghana Statistical Service (GSS), 2021). The Municipality has a total population 175,755 with the ratio of males to females being 85,712 to 90,043 respectively (Ghana Statistical Service, 2021).

West Mamprusi is primarily farming community, majority of the people engaged in arable crops production, forestry, and fishing, compared to industrial activities. Animal Farming focuses on small scale animals such as cattle, sheep, goats, pigs, poultry. Commercial crops such as water Melon and shea butter crops are produced (GSS, 2021).

Research design

The study employed explanatory sequential mixed methods design is being adapted to provide a blueprint for this study. Quantitative information was first collected, using survey questionnaires. This information was analysed, and results of this quantitative analysis was used to develop an interview guide to collect qualitative data. The investigator gathers qualitative data, analysed it, and compares the outcomes with those obtained from the quantitative analysis before making final interpretations. This design is relevant because it provides the researcher with a means of cross-validating the findings from the quantitative analysis with those obtained from the qualitative analysis before the final interpretation. This makes the overall strength of the study stronger than either qualitative or quantitative methods alone. Information was sourced from primary and secondary information. Primary information largely targets farmers, herders, chiefs, and integrated cattle owners residing within the Municipality. Information was gathered through engagements with key entities, Regional Peace Council, the Municipal Security Council, Non-Govermental Organisations, and the Ministry of Agriculture.

Target population

Population of the manuscript is considered to be the total number of all units of the marvel to be examined that occurs in the area of study (Kumekpor, 2002). The sample frame for the study comprises individuals and households living in peri-urban communities in the West mamprusi Municipality, with a reported incidence of high activities or conflict between farmers and herders. The target population of the studies includes key personnel within the security agencies, the Department of Food and Agriculture, and non-governmental organizations with an interest in agriculture and social cohesion.

Sampling techniques

Sampling involves selecting a portion of a population to represent the whole (Babbie, 2016). This study adopted a multistage approach. First, purposive sampling identified communities in the Municipality with farmer-herder conflicts reported in the past three years. Within these, 14 key informants (9 males and 5 females), including chiefs, tendana, magazias, and assembly members, were purposively selected for in-depth interviews. Respondents, aged 18–38, were recognized community opinion leaders. Additionally, convenience sampling was used to select household heads for semi-structured interviews.

Sampling size

The study ensured broad stakeholder representation by sampling groups central to food security in the West Mamprusi Municipality. Participants were categorized by occupation: (1) farmers cultivating crops like water melon, maize, yam, and millet ; (2) Fulbe herders, mainly migrant Fulbes from Nigeria, Burkina Faso, and Mali; (3) cattle owners, including both indigenous employers of herders and migrant herders with their own herds; (4) intermediaries who traded farm products and livestock across local and external markets; and (5) traditional authorities, particularly chiefs of the various chiefdoms. These groups were selected for their direct involvement and insights into farmer-herder activities and their implications for food security, as shown in Table 1 below.

Table 1 Sampled Participants

Category	Sample frame	Sample size
Farmer	1127	137
Herder	791	96
Cattle own	446	54
Intermediaries	413	50
Traditional authority	115	14
Total	2892	351

Source: Field Data, 2025

Data collection instruments/techniques:

To enhance validity and reliability, the study employed both surveys and key informant interviews. A semi-structured questionnaire was administered to household heads to examine the effects of conflict concerning food security, land use, and security, offering both structured responses and probing opportunities. Key informant interviews with community opinion leaders, Ministry of Food and Agriculture officials, the Regional Peace Council provided deeper insights into the effects, nature, and the sources of conflicts. Combining survey and interview data ensured a comprehensive understanding of farmer-herder activities and their impact on food security in the West Mamprusi Municipality.

Data analysis procedures

Dawit (2020), stated that data analysis is the process of scrutinising, transforming, and shaping data to reveal valuable intuitions, advocate decisions, and sustainable decision-making. Statistics and Data (STATA), version 18 and Microsoft Excel software packages, used for data scrutinising. Descriptive statistics such as frequencies, means, modes, medians, and standard deviations were also employed during the study. This help answer some research questions by describing and comparing variables numerically, as noted by Saunders et al. (2015).

The qualitative data, collected through in-depth interviews with key informants, will be transcribed, aggregated, and organized under thematic areas to gain a comprehensive thoughtful of the situation. This style aligns with (Gursoy, 2023), who emphasizes the importance of qualitative data in understanding relationships, such as those between farmer-herders and their impact on food security. By analysing qualitative and quantitative information, this study intentions to offer a complete empathetic of the multifaceted dynamics at play.

Ethical consideration

The study adhered to ethical standards by obtaining approval from the West Mamprusi Traditional Council and sub-chiefs. Informed consent was secured through forms read and translated into Mamprusi, Kassem, Frafra and Hausa. Respondents were informed on the purpose of the study, assured confidentiality, and protected from physical or emotional harm.

Findings and Discussions

Age

Only individuals aged 18 and above were included, as they could reasonably assess the effects of farmer-herder activities on food security. As shown in Table 2 below, nearly half of respondents were aged 18–38, reflecting the youth-dominated population of the Municipality (GSS, 2021), while older participants offered perspectives shaped by long-term experience with the conflicts

Table 2: Age of farmers and herders

Age	Frequency	Percentage (%)
18-24	33	9.4
25-31	65	18.5
32-38	62	17.7
39-45	55	15.7
46-52	44	12.5
53-59	53	15.1
60 and above	39	11.1

Source: Field Data, 2025.

Table 3: Qualitative results on activities of farmers and herders that contribute to food security

Codes	Basic Themes	Organising Themes
• Poor yield • Grazing inside farms • No farming	• Destruction of crops by cattle • Boycott from cultivating some type of crops	• Loss of revenues
• Fulani headers have connection • Political influence • Dead of farmers • Migration • Change of jobs	• Loss of farmers and herders • Change of occupation • Movements of farmers to other areas	• Loss of labour

• No gain in farming • Dead of herders • Emigration of herders • Injuries to farmers • Injuries to herders	• Movement of herders to other areas • Permanent injuries that disable farmers or herders

Source: Field data, 2025.

Loss of revenue

> The study found that farmer-herder activities in the West Mamprusi Municipality cause major economic losses for both groups. Crop destruction by cattle has forced many farmers to abandon tubers like cassava and yam, leading to food insecurity, loss of income, and reduced jobs in cassava processing. Farmers face declining yields and household revenue, while Fulbe herders lose livestock to attacks, traps, or poisoning, further straining community livelihoods. These hardships heighten tensions and instability in the Municipality referred to 3 above. *"I woke up early in the morning, prepared myself, and hurried over to my farm since I hadn't been there the day before. To my greatest shock, I arrived to find all my cassava plants cut down, with the tubers uprooted and left for cattle to feed on. I was heartbroken, knowing that my farm was my only source of hope and livelihood. With it being the dry season, I couldn't trace any footprints to identify who was responsible. Overwhelmed with frustration and sorrow, I wept like a child in the middle of my farm. I am convinced that I was being monitored and that the Fulani herders were responsible. Just for taking a Sunday to participate in a community event, I lost everything. As I sit here today, no one can convince me to venture into cassava farming again"* (Key Informant, Kaparigu).

Another key informant from Walewale was also emphatic about the economic consequences of the farmer-herders' activities in West Mamprusi Municipality. In an interview, he explained

> *"Our department maintains annual data on both crop and livestock production within the municipality. This data provides detailed records of the total metric tonnes of cereals, legumes, and other crops produced. While there has been an increase in the production of both crops and livestock including small and large ruminants, sheep, goats and cattle. Crop yields have declined due to the destruction caused by cattle. Additionally, the absence of a local cattle market forces herders and livestock owners to transport their animals to the Buipe market, leading to revenue losses for individuals, traders and the municipality revenue generation for development"* (Key Informant, Walewale, West Mamprusi Municipality).

Overall, it could be said the activities of both the farmers and herders have implications with both losing revenue because of the demolition of farms and the butchery of animals which results in a loss of market value. This finding corroborates that of Mbah et al. (2020) when they investigated the economic impacts of farmers and Fulbe herder conflict in Benue State, Nigeria, and found that the conflict reduced farmers' revenue because their food produce was destroyed, markets and farming activities disrupted and household experienced widespread food insecurity.

Loss of farm labour

The results of the analyses showed that loss of labour is a consequence of the conflicting activities affecting both farmers and herders, cited in table 3 above. Clashes often result in deaths, injuries, and migration due to insecurity, forcing both groups to abandon their traditional livelihoods. While

some farmers relocate, others change occupations due to the continuous demolition of farms by cattle. The majority of the youth are moving into charcoal production, while herders migrate to other areas. This, by either group, contributes to a reduction in the agricultural workforce, thereby weakening local economies. One of the key informants, who was an assemblyman, explained:

> *"Many of our youths are becoming increasingly reluctant to get involved in agriculture, mainly because of the disruptions caused by uncontrolled grazing during the night. Leading to serious to loss of farm crops. This issue has affected water melon production a lot, as a result, it has pushed the youth to look for other ways to make a living, such as charcoal burning or taking on menial jobs like head porters (kayayo). This shift away from farming has caused a decline in labour within the Agricultural value chain sector"* (Key Informant, Kaparigu, West Mamprusi Municipality).

A Fulbe herder shared how he lost his son and cattle, forcing him to relocate from his previous community to settle with his brother in another community within the same municipality.

> *"I lost my son two years ago, he was shot and killed like an animal. Even now, I still don't know who did it. That same day, I also lost seven of my cattle, which were stolen. The whole incident left me deeply traumatized, and without anyone to lean on, I had to move and settle with my brother here. When I went to the police to report what happened, they asked for money before they would even start an investigation, just because I am a Fulbe"* (Fulbe Herder, Wulugu, West Mamprusi Municipality).

The finding of the effects of farmer-herder activities leading to loss of labour aligns with the study of Ntangti et al. (2019) in Cameroon, which examined the effects of the conflict and found that it significantly reduced the number of youths engaged in agriculture in the Timanku Province of Cameroon.

Resource conflict

The study found that farmer-herder conflicts stem largely from competition over scarce resources, especially land and water. Cattle grazing on crops often triggers clashes, while urban expansion, deforestation, and overuse of land and chemicals worsen shortages and degrade soil and water. As herders search for pasture, tensions rise, leading to crop losses for farmers and hardship for herders. A sub-chief and farmer observed that this growing competition has increasingly resulted in violent clashes, adding (Abosede and Fatma, 2024 and Nelson, G. C., Rosegrant, M. W., Palazzo, A., Gray, I., Ingersoll, C., Robertson, R., ... & Tokgoz, S.2010):

> *"I rely on the rains and the irrigation from the river to grow my crops, which are essential for feeding my family and bringing in some income. Last year, a Fulbe herder brought his cattle to the river for water, but he didn't keep them under control. They wandered over to the other side of the river and ended up damaging our crops during the prolonged dry seasons, leading to a clash between us"* (Key Informant, Gbimsi, West Mamprusi Municipality).

A Fulbe key informant also shared his thoughts on the treatment they receive from indigenous farmers. He explained:

> *"They are always looking for our trouble, they will farm around our area of settlements because they think is fertile without leaving a walkway for our cattle, forcing us to relocate As if that is not enough, they will equally farm around the river banks, knowing very well that we all depend on the water for survival, Honestly, many of these fields aren't even real*

farms they're just traps set up to demand heavy compensation for any crops that get damaged" (Fulbe Key Informant, Guabuliga, West Mamprusi Municipality).

Tensions between farmers and herders, fueled by disputes over crop destruction and limited grazing land, have at times escalated into deadly violence. Deep mistrust, noted by Bukari (2017), reflects broader struggles in Ghana where deforestation, climate change, and population growth intensify competition for resources. The International Crisis Group (2020) warns that without effective land management and conflict resolution; such disputes will continue to endanger lives and livelihoods while dividing communities.

Establishment of ranches

The data suggests that designating grazing lands or restricting herders to specific areas could reduce crop destruction, water pollution, and related conflicts. While underlying ethnic, religious, and cultural differences can intensify disputes, regulating herder movement would minimize key triggers. Respondents including farmers, civil servants, NGOs, and chiefs widely supported ranching as a policy solution to ease tensions and improve food security. A community member explained

"The challenges posed by the Fulbe herders are really impacting us, to the point where our young people are turning away from farming. This shift has made it hard for us to take pride in our arable crop production. We should seriously think about measures like designating specific areas for grazing or setting up fenced grazing lands to help stop the nighttime damage to our farmlands and ease the tensions between farmers and herders. If the government can back the enforcement of such policies, it could motivate our youth to get back into agriculture, which would ultimately help tackle unemployment in our community" (A farmer, Janga, West Mamprusi Municipality).

A respondent from a non-governmental organization noted that ranching has resolved farmer-herder conflicts in many countries and suggested Ghana adopts similar best practices, stating *".....Today, ranching is a common practice in countries like the United States, Argentina, and Australia. In Africa, nations such as Kenya, Namibia, Nigeria, and South Africa have embraced ranching to boost livestock productivity and ease tensions between herders and farmers. In fact, ranching is increasingly viewed as a viable solution to the conflicts between farmers and herders, with Nigeria and Kenya rolling out policies to promote controlled grazing. We could definitely learn from this approach!"* (Key Informant, Walewale, West Mamprusi Municipality).

Research by Jimoh et al. (2020) showed that ranching, as practiced in Nigeria through effective grassland management, minimizes farmer-herder conflicts and could serve as a model for West Africa. They argue that organized grazing systems would improve livestock management and reduce land disputes. Conversely, Sule (2020) found that resentment toward Fulbes herders, rooted in historical tensions, drives much of the conflict in Nigeria. He cautioned that banning open grazing alone may worsen clashes and provoke retaliatory attacks rather than resolve the problem.

Table 4: Qualitative results on contributions of farming and herding to food security

Codes	Basic Themes	Organising Themes
• Loans • Loan repayment • Finance for inputs • Loss of credibility	• Inability to repay loan • Inadequate money for inpust	• Indebtedness

• Embarrassment • No food cultivation • No cattle rearing • Reduction in the availability of beef • Inadequate food	• Low food production • Reduction in household food • Reduction in the availability of beef • Purchase of food by farmers	• Food insecurity

Source: Field data, 2025.

Indebtedness

The study revealed that many farmers fell into debt after borrowing from institutions like Agric Development Bank, Bangmarigu Community Bank, and West Mamprusi Community Bank. Expected loan repayments became impossible due to crop losses from cattle destruction and erratic rainfall, leaving some farmers without harvests. This financial strain disrupted livelihoods and pushed them to seek alternative means of survival, Cited in table 4 above.

A key informant respondent shared her experience as the leader of a VSLA group who took out loans to cultivate several acres of maize, only to be devastated by a prolonged drought.

> *"My VSLA group saved our contributions with Bangmarigu Rural Bank to qualify for a loan of 30,000 Ghana cedis, which we used to cultivate maize on 10 acres of land. We were optimistic about a bumper harvest, but just as the maize reached the tasseling stage, the rains stopped for five weeks, resulting in extremely poor yields. Now, the bank is still chasing us for repayment, and we are struggling to find a way out"* (Key Informant, Guabuliga West Mamprusi Municipality).

A farmer shared how he fell into debt, owing an agrochemical organization and struggling to pay the laborers he had hired.

> *"I cultivated over eight acres of maize, but I couldn't harvest a single crop because Fulani herders allowed their cattle to graze on my farm overnight, destroying everything. When I reported the incident to the community chief, he dismissed my case, saying it would be unfair to hold all the herders responsible since I couldn't identify the exact culprit. As a result, I have been left in debt, unable to repay the agrochemical suppliers or pay the labourers I hired for the farming season"* (Farmer, Guabuliga, West Mamprusi Municipality).

Food insecurity

The study revealed that farmer-herder activities disrupted food production, reducing both crop yields and livestock sales, thereby limiting food availability and fueling insecurity, cited in table 4 above. Many commercial farmers reverted to subsistence farming or shifted to charcoal burning due to farm destruction, further lowering household and district food supply. Food insecurity, defined as limited access to adequate and nutritious food (Bruck & d'Errico, 2019), was confirmed in interviews with the Department of Food and Agriculture

> *"From my own experience, I can say that years ago, nearly everyone in this municipality was engaged in farming. Even those with white-collar jobs maintained small farms in their villages. Traders used to come from the south to buy our produce, but things have changed. Now, instead of supplying water melon, yam, and maize, we have to import them to meet the growing demand. The decline in local production is largely due to the reluctance of*

> *young people to engage in commercial farming, mainly because of the destruction caused by Fulbe herders. Their repeated invasions of farmlands have discouraged many from investing in agriculture, which is now affecting the municipality's food security"* (Key Informant, Wulugu, West Mamprusi Municipality).

A veterinary officer explains the reasons behind the high cost of meat in the municipality, despite the expectation that it should be lower due to the presence of Fulbe herders in nearly every community and the increasing number of cattle.

> *"Meat is very costly of late because the Fulbe herders would prefer to transport the cattle to the Bolga market for more financial value than selling it within the municipality even though we have very high production of cattle yet with low production in small ruminants which is as a result of high stealing rate among the youth who don't want to labour"* (Key Informant, Gbimsi, West Mamprusi Municipality).

Discussions

Activities by farmers and herders that leads to food security in West Mamprusi Municipality

The study revealed that farmers and herders engage in various agricultural activities that impact food security in the West Mamprusi Municipality. The most prevalent activities include crop cultivation and livestock rearing, with a significant majority of 74.4% of respondents strongly agreed and 25.6% agreed on their involvement in crop farming, while 74.6% strongly agreed and 25.4% agreed on livestock rearing. These events are important for the production of food and generation of income, in order to reinforce their protagonist in sustaining home-grown livelihoods. According to Blattman & Miguel, 2010; Adelaja & George, 2019; George et al., 2021, notwithstanding these aids, the Manuscript found that the events of farmers and herders have commercial and labour correlated penalties. Crop devastation by cattle, land conflicts and financial constraints have caused in substantial profits, sufferers, compelling roughly farmers and herders to unrestraint their outdated livelihoods. The loss of farm labour due to migration of the economically active persons. uncertainty, and working has weakened agricultural productivity in the municipality, this is established by Yakubu et al., 2021 and Nnaji et al., 2022.

Elusiveness farmers and herders face in getting land and its ramifications on food security in West Mamprusi Municipality

The manuscript reveals that getting natural resources remains a major challenge for farmers and herders in the West Mamprusi Municipality, water scarcity is one of the critical issues. About 62.7% respondents stated inadequate access of water, leading to lesser crop yields, livestock losses, and creating tensions between farmers and herders. Also, frustration with government policies was apparent, as more than 50% of respondents alleged that strategies was not sufficiently support land acquisition and workable agricultural practices.

Mekuria & Ayenew, (2018) and Mustapha & Bénéï, (2012) opined that global changes also heightened these issues, with impulsive climate patterns aggravating land degradation and water scarcities.

The study was strengthened by the qualitative data of these results, exemplifying how disputes over land and water degenerate into violent disputes among farmers and herders, this is attributed to Agyemang, (2019) and Abubakari et al., (2020). Respondents reported that unregulated grazing, deforestation, and the expansion of farmlands into grazing areas intensified tensions, often resulting in crop destruction, retaliation and deep-seated mistrust between the groups.

Conclusions

The study concluded that dual impression of farmer-herder conflicts about food security in West Mamprusi Municipality support food supply, income generation, soil fertility, and market stability. They also drive conflicts, indebtedness, and declining youth interest in farming. Livestock farming enhances productivity and diet diversity but causes farmland destruction and economic strain and forcing some farmers to scale down or abandon agriculture. Despite widespread cattle rearing, local meat prices remain high as herders sell in distant markets. Overall, the benefits of farmer-herder interactions are undermined by poor regulation, resource competition, and persistent conflict, posing serious threats to food security.

The following recommendation are proffered:

1. **Establishment of Grazing Reserves**
   The Government of Ghana, together with chiefs and cattle owners in West Mamprusi Municipality, should establish grazing reserves to keep cattle off farmlands, thereby reducing crop destruction and farmer–herder conflicts.
2. **Development of Fair Dispute Management Mechanisms**
   The Government of Ghana, the North East Regional House of Chiefs, non-governmental organizations (NGOs), and local residents should jointly develop fair mechanisms for managing farmer–herder disputes, replacing individual discretion that breeds mistrust.
3. **Creation of a Regulated Cattle Market**
   Municipal authorities, in partnership with traditional leaders and cattle owners, should establish a regulated cattle market to boost trade, revenue, and effective livestock management

Declarations:

Declarations:

Conflict of Interest Statement: The author state that there are no potential conflicts of interest.
Ethics approval and consent to participate: The manuscript was steered in accord with globally recognized ethical values for social science study. Granting the affiliated institution is not a formal Institutional Review Board nor ethics committee, ethical precautions was implanted in the interior of the research design. Involvement was voluntary and grounded on up-to-date consent, with respondents completely directed on the persistence of the study and their right to pull out at any time. Obscurity and concealment were safeguarded by not including individual identifiers and strongly handling all investigative materials. Prearranged the political warmth of the study, specific attention was taken to reduce possible menaces and guarantee partakers' protection and security all over the study process.

Confidentiality and Consent for publication: All your responses will be kept strictly confidential and anonymous. No identifying information (like your name or specific location) will be recorded. The answers you provide will be grouped together with others and used only for study. You have the right to refuse to answer any question or stop the interview at any time without penalty. The interview should take approximately 15-20 minutes.

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