



Adaptation Strategies of Women Dairy Producers in the Face of Security Challenges in North-East Nigeria

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Abstract

This study examines the adaptation strategies employed by women dairy producers in the face of escalating security challenges in North-East Nigeria. The study analyses the impacts of farmer-herder conflicts, cattle rustling, banditry, and climate-induced resource scarcity on milk production, household nutrition, and rural livelihoods. Guided by two research objectives the study adopts a qualitative research design utilising primary data collected through Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and In-Depth Interviews (IDIs), supplemented by secondary sources including academic journals, policy documents, and international organisation reports. The theoretical framework adopted for the study was the Sustainable Livelihoods Framework (SLF). Findings reveal that persistent insecurity has eroded dairy women's productive assets, restricted their mobility and market access, and deepened their structural vulnerability. The study further establishes that entrenched gender inequality fundamentally constrains the adaptive capacity of dairy women beyond short-term coping responses. While collective action through cooperatives and self-help groups represents the most structurally effective adaptation pathway, its potential remains curtailed by cultural barriers, weak governance, and policy neglect. The study recommends the adoption of a gender-responsive, community-driven framework for intervention that prioritises secure infrastructure, financial inclusion, cooperative development, and the integration of dairy women into agricultural policy and decision-making processes across North-East Nigeria.

Keywords: Women dairy producers, adaptation strategies, security challenges, Sustainable Livelihoods Framework.

1. Introduction

Dairy production occupies a foundational position in the food systems and rural economies of North-East Nigeria. For Fulani pastoral communities - among the most extensive cattle-herding populations in West Africa - milk and its derivative products including nono (fresh fermented milk) and fura da nono (millet and fermented milk) constitute both primary sources of nutrition and critical livelihood commodities (FAO, 2021; Samuel, 2023). Within these communities, women have historically been the central actors in milking, processing, and marketing dairy products, rendering their economic contributions indispensable to household food security and income generation even as formal recognition of their roles has remained structurally limited (Mani et al., 2024; Jagadeesha, 2024).

In the North-East Nigeria, the structural underdevelopment of the dairy sector has been catastrophically compounded over the past decade by an accelerating security crisis. The region—encompassing Adamawa, Borno, Gombe, Taraba, Yobe, and Bauchi States—has been subjected to the overlapping devastations of the Boko Haram insurgency, farmer-herder conflicts, armed banditry, and kidnapping, creating conditions of profound insecurity that have dismantled pastoral livelihoods and forced massive internal displacement (ACLED, 2023; International Crisis Group, 2020). SBM Intelligence (2021) estimates that over 1.5 million cattle were rustled across northern Nigeria between 2011 and 2021, representing the destruction of irreplaceable household capital for dairy-dependent families. For women who have built their economic identities around dairy production, these losses translate directly into reduced milk output, diminished income, deteriorating household nutrition, and deepening poverty.

The gendered dimensions of this crisis deserve particular emphasis. As the primary operators of the dairy value chain, Fulani women bear disproportionate exposure to the impacts of insecurity while simultaneously facing structural barriers—including patriarchal norms governing asset ownership, restricted mobility, and exclusion from institutional support systems—that constrain their ability to adapt and recover (Muokeku, 2024; Das & Singh, 2020). Despite the clear urgency of these intersecting vulnerabilities, empirical research that specifically examines the adaptation strategies of dairy women in conflict-affected communities of North-East Nigeria remains limited. Most existing studies have addressed farmer-herder conflicts and rural insecurity at a macro-level without adequately centring the gendered livelihood experiences of women in these communities.

2. Statement of the Problem

Nigeria's dairy sector faces a structural deficit of profound economic consequence. Despite the critical importance of milk and dairy products to household nutrition and rural income—particularly in pastoral communities of the North-East—domestic production meets less than 40 percent of national demand, with the remainder supplied through imports at annual costs exceeding one billion US dollars (FAO, 2021; CBN, 2019). This deficit persists despite policy interventions such as the Central Bank of Nigeria's backward integration programme and reflects deep systemic challenges including low herd productivity, fragmented value chains, inadequate veterinary services, and minimal institutional support for smallholder producers (World Bank, 2021).

These structural weaknesses have been dramatically intensified by the deteriorating security environment in North-East Nigeria over the past decade. Farmer-herder conflicts have escalated sharply in frequency and lethality, particularly in Adamawa, Borno, and Yobe States (International Crisis Group, 2018, 2020). Concurrent threats from armed banditry, cattle rustling, and kidnapping have compounded the crisis, resulting in widespread displacement, massive livestock losses.

SBM Intelligence (2021) documents over 1.5 million cattle rustled from northern Nigeria between 2011 and 2021, while the National Bureau of Statistics (NBS, 2022) records steep declines in agricultural output across the North-East region over the same period. The problem is compounded by the structural gender inequalities that characterise pastoral communities. Women who perform the bulk of dairy labour rarely own the cattle from which their livelihoods derive, excluding them from accessing credit, insurance, and other formal financial instruments that could support recovery and adaptation (Mani et al., 2024; Muokeku, 2024).

Existing interventions have largely focused on kinetic security responses or broad agricultural development programmes that neither target the specific vulnerabilities of dairy women nor address the structural gender inequalities that constrain their adaptive capacity. There remains a critical gap in the empirical literature on the specific adaptation strategies that dairy women in North-East Nigeria employ to sustain their livelihoods under conditions of persistent insecurity, and on the institutional and policy environments that support or undermine these strategies. This study is positioned to fill that gap.

3. Research Questions

The following research questions guided this study:

1. What are the major forms of insecurity affecting dairy production among women in North-East Nigeria?
2. What coping and adaptation strategies are women dairy producers adopting in response to the insecurity on their household livelihoods?

4. Objectives of the Study

The broad objective of this study is to examine the adaptation strategies of women dairy producers in the face of security challenges in North-East Nigeria. Specifically, the study seeks to:

- i. Identify and analyse the major security challenges affecting dairy production among women in North-East Nigeria.
- ii. Examine the coping and adaptation strategies adopted by women dairy producers in response to security-induced disruptions.

Theoretical Framework

This study is anchored on the Sustainable Livelihoods Framework (SLF).

The Sustainable Livelihoods Framework, developed by Chambers and Conway (1992) and subsequently elaborated by the United Kingdom Department for International Development (DFID, 1999), offers a holistic approach to understanding how individuals and households construct, maintain, and adapt their livelihoods in the face of shocks, stressors, and structural vulnerabilities. The SLF identifies five categories of livelihood assets - human capital, social capital, natural capital, physical capital and financial capital whose availability and accessibility determine households' adaptive capacity and livelihood outcomes.

In the context of North-East Nigeria, the SLF is particularly relevant for analysing how the security crisis affects dairy women's access to these five asset categories. Cattle rustling and farmer-herder violence directly destroy natural capital (grazing land access and herd size) and financial capital (the primary savings and income source of dairy households). Displacement and mobility restrictions erode social capital by severing established trade networks and community support systems. Physical capital is destroyed in attacks and difficult to replace without financial and institutional support. Human capital is undermined as experienced dairy women are killed, displaced, or forced into alternative survival activities, dissipating accumulated knowledge and skills. The SLF also draws attention to the vulnerability context—the external shocks and seasonal stresses that shape livelihood outcomes - which in the North-East includes both climatic variability and violent conflict as primary drivers of vulnerability.

6. Methodology

6.1 Research Design

The study adopts a qualitative research design with a case study approach that focuses on dairy women in conflict-affected communities across North-East Nigeria, with particular attention to communities in Adamawa, Borno, and Yobe States where the intersection of farmer-herder conflict, Boko Haram-related insecurity, and climate-induced resource stress is most acute. The case study approach is appropriate because it enables the researcher to examine a bounded contemporary phenomenon—the adaptation of dairy women to security challenges—in its real-life context, with the full complexity of its social, economic, cultural, and institutional dimensions (Yin, 2018).

6.2 Population and Sampling

The target population of this study comprises women engaged in dairy production—milking, processing, or marketing—in rural and peri-urban communities in conflict-affected local government areas of Adamawa, Borno, and Yobe States. Purposive sampling was employed to select participants who possess direct experience with dairy production and have been affected by the security challenges under investigation. This sampling strategy is consistent with the qualitative study and ensures the selection of information-rich participants capable of illuminating the research questions (Patton, 2015).

Three categories of participants were selected: (i) dairy women (ii) male and community stakeholders and (iii) institutional actors. A total of 42 KII participants, 6 FGD groups (8 participants each, totalling 48), and 18 IDI respondents were engaged, yielding a combined primary data pool of 108 research participants across the three states. Sampling continued until theoretical saturation was achieved—the point at which additional data no longer yielded new themes or insights (Glaser & Strauss, 1967).

6.3 Data Collection

Primary data were collected through three qualitative methods. Key Informant Interviews (KIIs) were conducted with purposively selected individuals possessing specialised knowledge of the dairy sector, gender dynamics, or security conditions in the study area. Focus Group Discussions (FGDs) were used to capture collective experiences, community norms, and shared coping strategies among dairy women in six communities across the three states. In-Depth Interviews (IDIs) were used to elicit detailed personal narratives from 18 dairy women identified as having experienced particularly significant disruptions to their livelihoods due to insecurity.

Secondary data were collected from a wide range of published sources including peer-reviewed journal articles, international organisation reports, government policy documents, NGO field assessments, and news media archives covering North-East Nigeria (Creswell & Creswell, 2018).

6.4 Data Analysis

All audio recordings were transcribed verbatim and translated into English where necessary. Qualitative data were analysed using thematic analysis. Both deductive themes and inductive themes emerging directly from the data were incorporated into the analysis. Triangulation across the three data collection methods (KII, FGD, IDI) and between primary and secondary data was used to validate findings and identify convergences and divergences across sources.

7. THEMATIC ANALYSIS

7.1 Security Challenges and Their Impact on Dairy Production

The Nigerian agricultural sector's deep structural vulnerabilities have historical antecedents traceable to colonial resource management policies that systematically marginalised nomadic pastoralists by disrupting transhumance routes and eroding customary land rights (Falola, 1999). These foundational fragilities have in contemporary times evolved into severe security crises that represent, in the words of IFAD (2018), a near-total breakdown of local governance and security infrastructure in conflict-affected rural areas. In North-East Nigeria specifically, the security landscape is defined by the convergence of escalating farmer-herder conflicts, armed banditry, Boko Haram-related violence, and kidnapping—forces that Samuel (2023) characterises as a systemic collapse of rural safety that has fundamentally restructured the viability of pastoral livelihoods.

Farmer-herder conflicts, driven by competition over land and water resources increasingly scarce due to climate change and population growth, have intensified sharply in Adamawa, Borno, and Yobe States over the past decade (International Crisis Group, 2018). Badejo (2017) and Onuh (2023) provide empirical evidence that climate-induced environmental degradation acts as a primary catalyst for these conflicts, as deteriorating pasture conditions in the north force herders to migrate further south and into agricultural lands, triggering violent confrontations with farming communities. For dairy women, the consequences of this violence are direct and immediate: cattle are rustled or killed during raids, grazing routes become inaccessible, and the constant threat of attack makes movement to markets too dangerous. Enloe (2000) argues that militarised conflicts are inherently gendered, often targeting the reproductive and economic roles of women, a pattern corroborated by Rosenblad et al. (2007), who document how rural women are transformed from supplementary income earners into primary household providers when conflict destroys male-dominated economic activities.

Onuh (2023) documents that some communities in North-East Nigeria experienced repeated attacks that wiped out entire herds over periods of two to three years, leaving families without any livestock assets from which to rebuild. For dairy women, these losses translate directly into the loss of their raw material—the cattle whose milk provides both household nutrition and market income. The literature confirms that within pastoral households, cattle are simultaneously the primary productive asset, the primary savings vehicle, and the primary source of family protein, meaning their loss constitutes a multi-dimensional livelihood catastrophe (Das & Singh, 2020; FAO, 2021).

7.2 Gender, Asset Ownership, and Economic Marginalisation

Perhaps the most structurally significant finding in the literature is the profound disconnect between the labour dairy women perform and the economic power they hold. Das and Singh (2020) describe rural women as invisible workers whose massive contributions to agricultural output are systematically under-recognised and under-rewarded. Feminist theory, as articulated by hooks (1984), explains this dynamic as a product of economic systems that marginalise women's labour by confining it to the unpaid or low-valued sphere, rendering it economically invisible even when it constitutes the majority of productive activity in a sector. Mukeni (2024), examining dairy cooperatives in Kenya, finds that while women perform the heavy lifting of daily milking, processing, and marketing, cultural norms of asset ownership ensure that cattle and land remain overwhelmingly controlled by men.

In the North-East Nigerian context, this ownership gap has devastating consequences for women's adaptive capacity in the face of insecurity. Because women do not own the cattle, they cannot use them as collateral to access bank loans or agricultural insurance. They cannot independently decide to sell cattle to finance relocation, purchase safer milking equipment, or invest in value-addition technologies that might reduce their exposure to dangerous market routes. Mani et al. (2024) document that even when women earn income from milk sales, husbands routinely control the allocation of that income, dictating how it is spent and rationing the amount of milk women are permitted to process. Sumangali and Maddileti (2025) and Nagasha et al. (2024) confirm that economic participation in dairy production does not automatically generate social empowerment or decision-making authority for women when structural gender inequalities remain unaddressed. Gergen (1999) frames this as the power of social constructs to limit individual agency—in pastoral communities, the construct of male financial authority operates as a structural barrier that persists even when women's economic contributions are acknowledged.

7.3 Adaptation and Coping Strategies of Dairy Women

Faced with severe security threats and restrictive cultural constraints, dairy women in North-East Nigeria employ a range of strategies to sustain their livelihoods, ranging from reactive short-term coping responses to more structured adaptive strategies with longer-term developmental potential. Drawing on social exchange theory (Emerson, 1981), which posits

that individuals adapt their behaviours based on available resources and power dynamics, these strategies can be understood as rational responses to constrained circumstances rather than expressions of passivity or helplessness.

In the immediate aftermath of livestock loss or displacement, dairy women typically resort to livelihood diversification—engaging in petty trading, backyard gardening, tailoring, and the commercialisation of household by-products such as cow dung for fuel to generate immediate cash (Badejo, 2017; Mani et al., 2024). Samuel (2023) characterises these as symmetric survival tactics: reactive and short-term defensive responses to immediate poverty rather than strategic enterprise decisions. While they demonstrate remarkable resourcefulness and resilience, the literature consistently notes that livelihood diversification at this level generates insufficient income to rebuild livestock assets or restore the pre-conflict dairy operation. They function as poverty mitigation measures, not livelihood recovery pathways.

Collective action through self-help groups (SHGs) and dairy cooperatives represents the most structurally significant adaptation strategy identified in the literature. Ponnusamy et al. (2020) demonstrate that women who participate in SHGs gain access to pooled microcredit, shared transportation to safer markets, collective bargaining for better milk prices, and peer support networks that provide both emotional resilience and practical information-sharing. Jagadeesha (2024) argues that participation in dairy cooperatives represents the primary pathway through which women can achieve financial stability in male-dominated agricultural societies, providing both economic and social advancement that individual action cannot generate. Mukeyu (2024) notes that despite systemic barriers membership remains a vital strategy for building collective power and accessing training, inputs, and market linkages that individual dairy women cannot access alone.

8. Summary of Key Findings and Discussion

8.1 The Multi-Dimensional Impact of Security Threats on Dairy Livelihoods

The findings from the KIIs, FGDs, and IDIs converge to establish that the security crisis in North-East Nigeria does not merely create fear or temporary disruption for dairy women but constitutes a systemic destruction of the productive environment on which their livelihoods depend. Consistent with the SLF's vulnerability context dimension, the evidence shows that insecurity operates as both a sudden shock—through discrete violence events like cattle raids and market attacks—and a chronic stress that progressively erodes livelihood assets over time, preventing recovery and compounding cumulative poverty.

Climate variability intensifies these security-driven vulnerabilities through a reinforcing feedback mechanism identified in both the literature (Onuh, 2023; Badejo, 2017) and the primary data. Worsening droughts and erratic rainfall reduce pasture availability, forcing herders into farming communities and triggering the conflicts that destroy pastoral assets. Dairy women thus face a double exposure: they are simultaneously vulnerable to the direct violence of security events and to the indirect, climate-mediated scarcity that generates those events. The SLF's emphasis on the multiple, interacting dimensions of vulnerability is therefore fully validated by the North-East Nigerian experience.

8.2 Structural Gender Inequality as a Constraint on Adaptive Capacity

The most consistent and analytically significant finding of this study is that the adaptive capacity of dairy women is fundamentally constrained by structural gender inequalities that predate and are amplified by the security crisis. Across all three data collection methods and all three state contexts, the study consistently finds that women perform the majority of dairy labour while being structurally excluded from ownership of the cattle that constitute the sector's productive foundation. This ownership gap, grounded in patriarchal norms that GAD theory identifies as the central target of gender-transformative development, prevents women from accessing formal credit, making independent enterprise decisions, or using livestock assets as the basis for recovery strategies.

The findings extend the existing literature by demonstrating the specific ways in which this ownership gap interacts with insecurity to compound women's vulnerability. When cattle are rustled, men as registered owners are the subjects of any compensation or insurance schemes. Women, despite having been the primary operators of the dairy enterprise, have no formal claim to compensation or recovery support. IDI respondents across all three states reported that male household heads whose retained formal authority over cattle decisions frequently made recovery choices that prioritise male interests or short-term asset preservation over the continuity of women's dairy enterprises.

8.3 Coping and Adaptation: The Limits of Individual Strategies and the Potential of Collective Action

The study's findings confirm the literature's distinction between reactive short-term coping strategies and more structurally significant adaptive responses. Livelihood diversification is the predominant immediate response of dairy women to security-induced livelihood disruption. These strategies are universally adopted and demonstrate the resilience and resourcefulness of North-East Nigerian dairy women. However, as Samuel (2023) and Badejo (2017) note and this study's primary data corroborate, they generate insufficient returns to rebuild depleted livestock assets or restore the dairy enterprise to pre-conflict capacity. They represent survival, not recovery.

Collective action through cooperatives and SHGs emerges from both the literature and the primary data as the most

significant pathway for sustainable adaptation. FGD and IDI participants who were members of dairy cooperatives or women's groups reported meaningfully better outcomes across multiple dimensions: access to pooled credit for livestock purchase or feed procurement, shared transportation reducing individual exposure to dangerous routes, collective negotiation of better milk prices, and access to extension services, training, and inputs that individual women could not access alone. The study's findings align with Ponnusamy et al. (2020) and Jagadeesha (2024) in identifying cooperative membership as the most effective structural adaptation mechanism available. However, the findings also confirm Mukeku's (2024) caution that cooperatives are not gender-neutral spaces: male-dominated leadership structures, cultural barriers to women's voice within group meetings, and the exclusion of the poorest and most displaced women from membership requirements mean that the transformative potential of cooperatives remains partially constrained even where they exist.

9. Conclusion

This study has established that the adaptation strategies of women engaged in dairy production in North-East Nigeria are shaped by the intersection of two overlapping crises: the escalating security emergency driven by farmer-herder conflicts, cattle rustling, banditry, and climate-induced resource competition; and the structural gender inequality embedded in the social, economic, and institutional fabric of pastoral communities. These two crises interact and amplify each other in ways that systematically undermine dairy women's productive capacity, constrain their adaptive options, and perpetuate cycles of poverty and vulnerability that individual coping strategies cannot break.

10. Recommendations

Based on the study's findings and conclusions, the following recommendations are made to government agencies, development partners, and civil society organisations working in North-East Nigeria:

1. The Federal and State Governments should establish and maintain secure grazing corridors and designated dairy production zones in conflict-affected LGAs of Adamawa, Borno, and Yobe States, with specific provisions for the protection of women's dairy operations, market routes, and milk collection points.
2. The Central Bank of Nigeria and state government microfinance agencies should design and deploy dedicated financial products for dairy women in conflict-affected areas, including asset-backed group loans that use cooperative membership as collateral in lieu of individual cattle ownership.
3. State governments and development partners should invest in the establishment and strengthening of female-led dairy cooperatives in conflict-affected communities, providing start-up capital, governance training, market linkage facilitation, and legal registration support.
4. Development partners and civil society organisations should design and implement community-based land and livestock tenure reform initiatives in pastoral communities, working with traditional and religious leaders to establish culturally appropriate mechanisms for women's formal recognition as co-owners of household livestock assets.

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