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MIGRATION STATUS OF HOUSEHOLDS AND FOOD SECURITY IN NORTHERN GHANA

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DECLARATION

I, Philip Johnson, certify that the work submitted in fulfilment of the requirements for the Master of Arts in Population Studies is my original research and that, to the best of my knowledge, it does not include any information that has been published elsewhere, or that has been submitted in fulfillment of the requirements for any other degree at this or any other university without proper citation.

……

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ACCEPTANCE

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DEDICATION

To the Lord and Saviour, JESUS CHRIST, without whom this work would not have been possible.

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Johnson family deserve thanks for their encouragement and support. Thank you for always being there for me.

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ABSTRACT

Household food insecurity is a pressing issue in Ghana, with many individuals turning to migration as a potential solution. However, in cases where migration fails to yield the expected benefits, migrants often encounter heightened food insecurity, particularly in northern Ghana. Existing reports and research highlight the significant prevalence of food insecurity in this region. This study aims to investigate the relationship between migration status and food security in northern Ghana and to provide policy recommendations to enhance food security in the area.

The study runs univariate, bivariate, and multivariate analyses using the dataset from Ghana Comprehensive Food Security and Vulnerability Analysis (2020). The total number of respondents was 1,259,300. The univariate results include frequencies, percentages, and the use of tables to present the results. The bivariate analysis employed crosstabs and chi-square tests to assess whether there were differences between the observed and expected data. At the multivariate level, a multinomial logistic regression model was used to illustrate the relationships between the primary independent variable and the various dependent variables.

The study reveals that 83.7% of respondents were non-migrants, while 16.3% were migrants. A significant proportion, nearly 72%, were classified as food secure, though 17% experienced moderate food insecurity and 11% were severely food insecure. Key demographic insights include that 86.4% of household heads were male, and most were married (90%). Educational attainment was low, with 63% having never attended school, and 44.6% of households had 4 to 6 members. Regionally, the Northern Region had the highest percentage of food-secure households, while the Upper East Region saw a higher prevalence of food insecurity. The analysis also indicated that non-migrant households were more food secure compared to migrant households, and significant associations were found between food security and factors such as age, education level, marital status, occupation, household size, and wealth status. Multivariate regression confirmed that nonmigrants were more likely to be food secure, and factors like educational

attainment and wealth were strongly associated with food security outcomes. Conclusively, the findings underscore the relationship between migration status and various socio-demographic factors in determining food security outcomes in this region.

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LIST OF ACRONYMS

Acronym	Full Name
CARE	Cooperative for Assistance and Relief Everywhere
CFSVA	Comprehensive Food Security and Vulnerability Analysis
COHA	The Cost of Hunger in Africa
FAO	Food and Agriculture Organisation
FCRN	Food Climate Research Network
GMO	Genetically Modified Organisms
GNNP	Ghana National Nutrition Policy
GSS	Ghana Statistical Service
PFJ	Planting for Food and Jobs
SDG	Sustainable Development Goals
UN	United Nations
UN-SDG	United Nations Sustainable Development Goals
WHO	World Health Organization

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Food security is achieved when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2008). The Food Climate Research Network (FCRN, 2020) emphasizes that food security is not solely about food availability but also about accessibility, utilization, and stability over time. While global food production is sufficient to feed everyone, disparities in distribution and access mean that many households, particularly in developing countries, still struggle to attain food security. As of 2023, the World Health Organization (WHO) estimated that 2.3 billion people globally experienced moderate to severe challenges in maintaining food security, with Sub-Saharan Africa facing the greatest burden (Nkegbe et al., 2017; Adjei, 2008; CARE, 2011).

In Ghana, which has a population of 30.8 million (PHC, 2021), achieving food security remains a national priority. Despite agriculture being a major contributor to the country's economy, approximately 50% of the population faces challenges in maintaining adequate food access (GSS, 2021). The Northern regions, in particular, are characterized by higher poverty rates (21.4%) and limited access to diverse and nutritious foods, contributing to chronic undernutrition, stunting, and anaemia (Coomson, 2020; GNNP, 2013). The Cost of Hunger in Africa (COHA, 2012) report estimates that Ghana loses 6.4% of its GDP annually due to undernutrition-related productivity losses and healthcare costs.

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Migration has emerged as an important household-level strategy for improving food security in Ghana. Internal migration, especially from the northern to the southern parts of the country, is often driven by the search for better livelihood opportunities that enable households to diversify income sources, increase purchasing power, and improve access to food. Remittances sent by migrant household members serve as a vital support system, helping recipient households afford more nutritious and sufficient food, thereby enhancing their food security.

Empirical evidence from Ghana shows a growing recognition of the role of migration status in shaping food security outcomes. Households with successful migrants those who gain stable employment and send regular remittances are often better positioned to achieve food security through improved income and access to markets. Conversely, households with unsuccessful migrants may struggle due to lack of support, unfulfilled economic expectations, and added household burdens. Moreover, migrants themselves may face food security challenges due to limited integration, unfamiliar food systems, economic hardship, or the absence of familial networks (Logan, 2016; Ham, 2020; Saaka, 2022).

Thus, the relationship between migration and food security is complex and context dependent. It can serve as a protective factor for some households while exacerbating vulnerability for others. This study contributes to the literature by examining how the migration status of household heads influences food security and by assessing whether receipt of remittances enhances household food security in the Ghanaian context.

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1.2 Statement of the Problem

Household food security has become an increasingly important focus in global political discourse, government policy, and academic research. In Ghana, ensuring food security remains a central

concern for policymakers due to regional disparities in access to adequate, nutritious food. One of the most pronounced divides exists between the northern and southern regions of the country. The northern belt comprising the Upper West, Upper East, Northern, North-East, and Savannah regions experiences relatively lower economic development, making households in these areas more vulnerable to food insecurity. According to the Ghana Statistical Service, the five most food-insecure districts Bolgatanga East, Tatale, Builsa South, Karaga, and Kassena Nankana West are all located in northern Ghana.

These regional disparities have contributed to widespread internal migration, particularly from the northern to the southern parts of the country. While urban centres such as Accra and Kumasi are popular destinations, towns within the northern region, like Tamale, also attract migrants. Migration, whether undertaken by individuals or entire households, is often a livelihood strategy aimed at enhancing household resilience and achieving food security. Studies by Awumbila et al. (2014) and Assan & Kharisma (2019) show that northern migrants move in response to limited economic opportunities, land scarcity, and poverty in their home regions.

Migration plays a dual role in the context of household food security. On one hand, successful migration can enhance household food security through remittances, improved income, and better access to food. On the other hand, unsuccessful migration characterized by unfulfilled economic aspirations and inadequate support networks may negatively impact food security. In such cases, households may face reduced access to agricultural land, disruption of traditional farming activities, and limited adaptation to new food environments (Boamah & Overa, 2016; Kuuire et al., 2013). The culinary and cultural adjustment challenges migrants face in unfamiliar

environments may also limit their access to preferred or nutritious foods, further affecting food security.

While internal migration in Ghana has been widely studied, most research has concentrated on north-south migration patterns and their implications for agricultural productivity and household income. There has been limited attention on north-north migration within the northern regions themselves and how these movements shape food security among migrant and non-migrant households. This is a critical gap, especially given the higher prevalence of poverty and limited infrastructure in northern Ghana (Nyantakyi-Frimpong & Benzer Kerr, 2017).

To address food security concerns, the Government of Ghana has implemented several agricultural interventions, including the "1-Village-1-Dam" initiative, the “Planting for Food and Jobs” programme, and fertilizer distribution schemes (Mabe et al., 2018). These efforts aim to boost agricultural productivity, stabilize food supplies, and reduce the need for distress-driven migration. Nevertheless, food security remains unevenly distributed, and many households in northern Ghana continue to rely on remittances from internal and international migrants to meet their dietary needs (Mabrouk et al., 2018).

Understanding how the migration status of households influences their food security is essential for designing responsive and regionally tailored interventions. While past studies have examined migration’s impact on income and agricultural output, few have explicitly explored how migration into or within the northern regions affects food security. This study fills that gap by assessing the relationship between household migration status and food security in Ghana’s five northern regions, focusing on how migration outcomes and remittance flows shape the food security status of households.

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1.3 Research Questions

1. What is the relationship between household migration status and food security in northern Ghana?
2. How are remittances associated with food security among migrant and non-migrant households in northern Ghana?
3. In what ways does the educational attainment of the household head influence household food security in northern Ghana?

1.4. Research Objectives

1. Identify the relationship between household migration status and severe food insecurity in northern Ghana.
2. Explore the association between remittances and food insecurity of migrants and non-migrant households.
3. Explore the relationship between the educational attainment of household head and food insecurity in northern Ghana.

1.5. Research Hypotheses.

1. (H_0): There is no significant difference in food security status based on the migration status of household heads in northern Ghana.
2. (H_1): Remittances are significantly associated with higher food security among migrant households compared to non-migrant households in northern Ghana.
3. (H_1): There is a significant relationship between the educational attainment of household heads and household food security in the five northern regions of Ghana.

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1.6. Rationale of the study

This study is important in three main areas: policy implications, livelihood strategies, and community resilience.

First, the findings of this study have significant policy relevance, especially in the context of northern Ghana, where food insecurity remains a critical concern. By examining the relationship between migration status and food security, the study will provide evidence to inform policies related to migration, agriculture, and social protection. These insights can support the design of targeted interventions that enhance food security outcomes by recognizing the role of migration dynamics, including both successful and unsuccessful migration experiences. Additionally, the study will offer valuable guidance on how remittances contribute to household food security and propose alternative strategies for households that do not receive remittances.

Second, the study aims to explore how migration shapes household livelihood strategies. Migration can function as a coping mechanism during periods of food stress, helping households diversify income sources and improve access to food. However, migration can also heighten vulnerabilities especially in cases where migrants are unable to meet expectations or remit regularly. This is crucial in northern Ghana, where social norms often place pressure on migrants to support relatives back home, potentially compromising both migrant and origin households' food security.

Third, understanding how migration influences food security can support community resilience. By identifying the strengths and weaknesses of migration-based coping mechanisms, the study can guide local initiatives to strengthen food systems and improve collective responses to food

insecurity. Communities that leverage this knowledge can invest in sustainable strategies, promote food system development, and build adaptive capacity to withstand future shocks.

In summary, this study will contribute to a broader understanding of how migration affects food security at the household and community levels and will offer evidence-based recommendations to support resilient and food-secure communities in northern Ghana.

1.7. Organization of Chapters

This study is organised into six chapters. The first chapter captures the background of the study, the problem statement, the research questions, the objectives of the study, the significance of the study, and the study's structure. The second chapter reviews relevant literature related to the topic. The third chapter covers the study area's profile, including its physical characteristics, economic activities, research strategy, data collection methods, variable measurement, and data analysis techniques. Chapter Four presents the univariate and bivariate results. Chapter Five details the multivariate results. The last chapter summarizes the findings of the study, draws conclusions, and provides recommendations.

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CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter two focuses on examining the existing body of literature concerning the relationship between migration and food insecurity. The purpose of this section is to establish the groundwork for the research. Conducting a thorough literature review allows for identifying gaps in the current knowledge, which this study aims to address. The chapter begins by defining key concepts such as food insecurity and migration and elucidating their interconnection. Additionally, it will present a conceptual framework outlining the relationships among the independent, dependent, and control variables.

2.1 Food Security

Numerous academics, policymakers, and local and international organizations have defined and theorised food security from different perspectives. This literature review aims to provide an overview of the various theories and definitions of food security, as well as the key sub-sections and relevant literature.

2.1.1 Definitions of Food Security

A number of definitions of food security have been proposed and coined by different organisations and scholars. The FAO has defined food security as "a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life". (FAO, 2002). This definition incorporates the critical elements of availability, access, utilisation, and food quality.

Food security has different components: availability, access, utilisation, and stability. Food availability refers to the physical availability of food, including production, distribution, and storage. Food access refers to the ability of individuals to acquire food, which is influenced by factors such as income, prices, and social safety nets. Food utilisation refers to the biological and social processes involved in consuming food, including digestion, absorption, and cultural practices. Food stability refers to the ability of food systems to withstand shocks such as natural disasters, conflicts, and economic downturns.

There is a vast literature on food security, including studies on the causes and consequences of food insecurity and policies and interventions to address it. Some key literature includes the Global Hunger Index (GHI), which measures hunger and undernutrition worldwide and provides a comprehensive picture of global, regional, and national food security (von Grebmer et al., 2020). Other relevant literature includes studies on the role of agriculture and food systems in promoting food security (Pingali, 2012), how climate change leads to food security (Wheeler and von Braun, 2013), and how social protection programmes help reduce food insecurity (Devereux and Sabates Wheeler, 2004).

Food security is a complex concept defined and theorised in various ways. Critical components of food security include food availability, access, utilisation, and quality, as well as the ability of food systems to withstand shocks. Policies and interventions addressing food insecurity should address poverty and inequality, promote sustainable agriculture and food systems, and strengthen social protection programmes.

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2.1.2 Definitions of Food Insecurity

Several definitions of food insecurity in the literature offer varying perspectives on the concept. According to the United States Department of Agriculture (USDA), food insecurity is characterised by "the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways." This definition emphasizes the dual aspects of both the physical availability of food and the social acceptability of how food is obtained.

The Food and Agriculture Organization (FAO) similarly highlights the critical nature of food security by describing it as "a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life." This perspective broadens the focus to include not only the availability of food but also its safety, nutritional quality, and long-term implications for health and development.

Meanwhile, the Healthy People 2030 initiative defines food insecurity as "a household-level economic and social condition of limited or uncertain access to adequate food." This definition highlights the economic and social dimensions of food security, recognizing that access to food is influenced by broader systemic factors that affect households' ability to consistently secure sufficient and nutritious food.

These definitions collectively contribute to a nuanced understanding of food insecurity, highlighting its multidimensional nature. It encompasses not just the physical availability and safety of food but also the socio-economic factors that influence access.

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2.2 Theories of food security

The concept of food security has been theorised in several ways. The Food and Agriculture Organization (FAO) proposed one of the earliest theories in 1974. This definition focused on food availability and did not consider issues of access and utilisation. It defined food security as "the availability of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices" (FAO, 1974).

Later, the 1996 World Food Summit defined food security as "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (FAO, 1996). This definition broadened the scope of food security to include issues of access and utilisation, as well as food quality and safety.

Another theory of food security is the entitlement approach, developed by Amartya Sen in 1981. This approach emphasises the importance of access to food and the ability to command food through entitlements such as assets, income, and social safety nets (Sen, 1981). The entitlement approach highlights the role of poverty and inequality in food insecurity and emphasises the need for policies that address these underlying issues.

2.2.1. Neo-Malthusian Perspective

The writings of Thomas Malthus, an 18th-century economist, addressed the relationship between population growth and food production. Malthus argued that population growth would eventually surpass the earth's ability to produce sufficient food, leading to widespread food insecurity. Neo Malthusians expanded on Malthus's ideas by emphasizing the issues associated with a growing global population, declining agricultural resources, and environmental degradation.

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Neo-Malthusian thinkers proposed that food insecurity would be exacerbated by fundamental problems such as a lack of governance and social issues, especially in developing countries (Smith, 2017). They explained that the inadequacy of arable land, water scarcity, soil degradation and other resources further strain the agricultural sector, making it challenging to meet the growing demand for food (Adamo et al., 2018). They also examined how climate change factors, including extreme weather events and changing growing patterns, interfere with agricultural productivity.

Critics have argued that neo-Malthusians extensively overlook how technology can aid in preventing the doomsday prophecy of neo-Malthusians. New technologies such as Genetically Modified Foods (GMO) or crops and improved agricultural practices enhance food production. These critics further emphasised how politics and economics lead to unequal distribution of resources and lack of access to markets, which are significant drivers of food insecurity.

2.2.2. Techno-ecology Theory

Another theory of food security is the techno-ecology theory, which focuses on how environmental factors can lead to food insecurity (Iveren, 2020). The theory was developed in the late 20th century and posits that technological advancement and innovation can decrease food insecurity. It argues that sustainable farming practices, such as environmentally friendly technologies and their ilk, can lead to economic development and reduce food insecurity (Vanbergen et al., 2020).

Techno-ecological theories argue that technological solutions like renewable energy sources, efficient resource management systems, and pollution control measures can promote food security and a safe farming environment. They believe that embracing technologies can open

markets, opportunities, and resource efficiencies without leading to the various doomsday prophecies advanced by neo-Malthusians (Katz-Rosene, 2022).

Critics of this theory raise concerns about the overemphasis on technology while neglecting broader social, political, and economic dynamics. They posit that technology may have possible negative consequences, which may lead to other negative consequences that have not been anticipated.

2.2.3. Dependence and World System Theory

The dependence and world system theory are another theory of food insecurity. This theory provides a perspective on how the global economic system can lead to food insecurity. Immanuel Wallerstein developed this theory. He stressed that food insecurity should not be viewed merely as a result of local factors but rather along interconnected factors such as global power dynamics and economic structures (Wallerstein, 2011).

Proponents of this theory argue that unfair social systems controlled by developed countries can lead to food insecurity in developing countries. This power imbalance creates dependence on export-oriented agriculture in peripheral nations, neglect of local food production, and vulnerability to fluctuations in global food markets. The theory argues that prioritising cash crops for export over domestic food production leaves vulnerable populations to price shocks and shortages. This is because poorer countries are forced to produce cash crops to generate foreign exchange rather than grow crops that solve food insecurity in these poor countries.

Understanding food insecurity through the lens of Dependence and World System Theory highlights the systemic nature of the issue and the need for structural transformations that address the imbalances in global trade, resource distribution, and power relations (Garnett, 2014).

This includes promoting sustainable agriculture, strengthening local food systems, and advocating for fair trade practices to tackle the underlying causes of food insecurity.

2.2.4. Urbanisation Theory of Food Security

Urbanisation has been linked to food insecurity, especially in developing countries. Massive rapid urbanisation leads to fewer people in agricultural areas for farming (Raihan & Tuspekova, 2022). The growing population in urban centres results in fewer people remaining in rural areas to work in agriculture. This, therefore, implies that rapid urbanisation may lead to accelerated food insecurity, especially for marginalised populations.

A significant aspect of urbanisation is how it leads to urban expansion to the detriment of rural and agricultural expansion. The expansion of metropolitan cities and the creation of peri-urban areas leads to farmland depletion (Naab et al., 2013). As urban cities expand, the land available for farming is impacted. The reduced agricultural lands may affect food production, leading to food insecurity in an area or the country as a whole.

Urbanisation is said to change dietary and culinary patterns. This is because migrants would have to adjust to new foods and technology that were not available in their old place of residence. This leads to a shift towards less nutritious diets, which can contribute to health issues such as obesity and malnutrition and further exacerbate food insecurity. Addressing food insecurity in urban contexts requires a multifaceted approach that includes urban planning strategies to preserve agricultural land, promote local food production, enhance access to nutritious food, and establish supportive policies and regulations. By recognising the unique challenges and opportunities of urbanisation, efforts can be made to create resilient and sustainable food systems that meet the growing populations' needs.

2.3 Impacts of Food Security on Households

Reducing poverty and ensuring food security are two of the global issues that are receiving attention from policymakers. Population increases in developing countries and widespread poverty have all contributed to food security issues, especially in households. Some schools of thought have suggested that technology is essential in reducing food insecurity. Substantial evidence supports the idea that advancements in technology have boosted food production and storage; however, this progress has not yet fully translated into achieving food security for everyone globally (Reganold & Wachter, 2016).

Poblacion et al. (2022) explain food security as "the condition of having sufficient food for an active and healthy life, including the availability of nutritionally adequate and safe foods." Food insecure people need a reliable source of food and need help to afford the food they need. A wide range of studies has been carried out to illustrate and conceptualise food security at the household level (Ansah et al., 2019). Others highlight the link between food insecurity, vulnerability, and migration, while others highlight the threat posed by inadequate access to food. Understanding its historical context is crucial to gaining a firm grasp of the present situation. Focusing on education about how food imports and sustainable agricultural practices help Ghana feed its people abundantly is also vital in assessing the impact of food security in Ghana and Africa at large.

According to studies conducted in a variety of countries and healthcare systems, food insecurity is consistently linked to low household resources, low disposable income, and low social status

(Afulani et al., 2015; McIntyre et al., 2014; Maga-Lemus et al., 2016; Lumb et al., 2016). Indigenous communities, the unemployed, and people with chronic health conditions or disabilities are unevenly impacted by food insecurity. Aljamal and Bagnied (2021) state that food security occurs "when all people at all times have access to sufficient, safe food to maintain a healthy, active life." The availability of nutritious and safe food is a growing global concern. In some parts of the world, people are going hungry due to the persistent food shortages that have caused price spikes, human migration, and malnutrition.

Four factors have been identified in this definition. The first is the propensity of the populations, individuals, and their households to have adequate food to meet their needs at all times. The second definition is based on how sufficient qualities of foods are available at most times and in their appropriate quantities. The third definition examines how individuals can access a healthy and nutritious diet, dependent on clean water and sanitation. The fourth definition views healthcare as a pathway to achieving overall nutritional well-being, ensuring that all physiological needs are met. It also highlights the importance of access to sufficient food.

This definition, however, does not reveal how much of a positive impact food intake has on productivity. In response to this shortcoming, the World Bank introduced the most commonly used definition of food security. This definition shifted the emphasis from food availability to food access and refocused the discussion from international and national levels to the household and individual levels (Alori, 2016).

The 1948 Universal Declaration of Human Rights included the right to food. However, the idea of food security entered the international development sphere in the mid-1970s (Goodman, 2016). Low grain reserves, rising oil and agricultural input prices, and natural disasters all contributed to

the difficulty of this period. Consequently, the UN World Food Summit 1974 introduced the food security discourse intending to rally international support and forge agreements to guarantee adequate food production alongside stable supply and prices.

However, it is now clear, less than a decade later, that merely increasing the quantity of food available did not lead to greater food security (FAO, 2019). In the early 1980s, after it became clear that increasing food production alone would not solve the hunger problem, the food security conversation shifted to food access issues. The 1996 World Food Summit witnessed the broadening of the definition of food security to include the following: "All people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Ingram, 2020). This definition of food security is used as a point of reference in current discussions and is discussed in depth throughout this thesis.

Researchers and international organisations have developed various definitions of "food security". The term "food security" has close to 200 different meanings (Peng & Berry, 2019). The 1974 World Food Conference marked a shift in focus from national food security and increasing supply to enhancing access to food during the 1980s (FAO, 2019). Peng and Berry (2019) defined food security as having access to enough food necessary for a person to lead a healthy and active life. A household is considered food secure when all of its members have year-round access to sufficient nutritious food to maintain an active and healthy lifestyle. At the household level, "food security" refers to ensuring that all members have access to adequate food to meet their nutritional needs. This food can come from the household's production or outside sources (Pourreza et al., 2018). Food Security is "The capacity of a household to procure a stable and sustainable basket of adequate food," as defined by the International Fund for Agricultural

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Development (IFAD). All members of the household have access to a diet that offers sufficient nutrition, measurable by the quality and quantity of the food available. The more common definition of food security emphasises the stability of a family's food supply through changing seasons and temporary food shortages. Self-sufficiency, human dignity, resource use and management are some of the many that fall under the umbrella of sustainability, making it the most complicated of the terms (Guma et al., 2022). Given this supposition, it is evident that having a sufficient food supply is no guarantee that all household members will have their nutritional needs met.

Food security was defined at the 1996 World Food Summit. According to Ingram, it refers to the condition where all individuals have access to safe and nutritious food that satisfies their dietary needs and preferences for a healthy and active life. Food security is a multifaceted issue influenced by a range of factors, including agro-environmental, socioeconomic, and biological factors. These factors must be considered and recorded to determine whether food security exists. Other sources confirm that the best way to quantify this idea is to consider every variable that might affect the outcome.

In another attempt to explain food security, WHO (2019) showed that a decline in food availability does not cause food insecurity but reflects the circumstances under which people cannot obtain food. They contend that while there is enough food for everyone, unequal distribution has led to food waste in some areas and food scarcity in others. Nonetheless, new conditions, such as drought, may negatively impact them. The absence of rainfall and the inability to irrigate result in crops in the fields wilting and dying rapidly. Until the rains return, the primary income source for locals who previously worked in the fields has diminished, rendering them highly susceptible to starvation. Those with limited livestock face a similar

challenge, as the animals lose strength and value due to insufficient nourishment. Moreover, the dynamics of supply and demand, compounded by the opportunism of intermediaries, drive up grain prices, significantly reducing its trade value for livestock. Consequently, individual's dependent on purchasing food who have experienced a breakdown in entitlement relationships are in a precarious position. While food availability might persist, ensuring adequate household nutrition remains uncertain.

To support the above points, WHO (2019) emphasized the importance of access to food for a household's sense of food security. According to them, entitlement relations are shaped by what individuals own, can trade, inherit, or receive. They consider property and financial resources as key factors in determining these entitlement relationships. However, some contend that the emphasis on whether individuals and families purchase food has deeper historical roots and is closely tied to nutrition planning. Food security ensures that no one goes hungry (Price & Nguyen, 2016). In addition, the literature demonstrates that a decrease in food entitlement does not require a reduction in food availability. For example, Eubanks (2018) argued that the household is not the proper locus for focusing on the entitlement relation because it ignores inequalities in food distribution within the household. This happened because of a breakdown in integrating the household's entitlement relations into the larger community's social and political structures.

Crush's (2012) study explored the relationship between internal migration and food security under the theme "Linking Migration, Food Security, and Development." He examines (a) how migrants fulfil their nutritional needs upon arriving at their new location and (b) how their earnings are used when sent back home. According to him, migrants frequently include food in their remittances, highlighting that cash is not the only way migration supports household food

security. He further explained that food insecurity in African cities is primarily driven by the lack of a stable income to purchase food, rather than by production shortages.

Several studies have shown that most remittances are spent on consumption rather than investment in production (Castaneda, 2013; Nguyen et al., 2017; Wadood & Hossain, 2017; Adams &

Cuecuecha, 2013; Mara et al., 2012). This includes the purchase of food, education, and healthcare.

This means that their very survival depends on migrant workers and that if they stop sending money home, it will have a devastating effect on their standard of living. Some scholars have sought to justify the use of remittances by suggesting that the funds are more effectively allocated to purposes beyond merely providing for basic sustenance (Strielkowski & Weyskrabova, 2014; Waidler & Devereux, 2019; Kakhkharov et al., 2021). For example, remittances can be used to upgrade living quarters, buy necessities like furniture and appliances, fund vacations, assist family members, and start businesses, among others.

At the household level, food security is defined as the capacity to produce or purchase enough food to satisfy the dietary needs of all household members. Each member's nutritional status relies on the availability of food, the adequacy of shared food in terms of quantity, quality, and safety, and the overall health of the household members. The term "food availability" denotes the continuous presence of sufficient food supplies across different scales, whether at the national, regional, local, or household level. This phrase signifies that food is accessible because it has been physically produced, imported, and transported to the area. For example, food is available for consumption as it is sold in markets, cultivated on farms and in backyard gardens, or provided through humanitarian aid. Hence, food is both visible and accessible (Ogwal et al., 2022).

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The concept of "food access" pertains to the financial capacity required to acquire nutritious food. It encompasses the various ways communities obtain their food supply, including through home gardening, purchasing, bartering, receiving gifts, borrowing, or accepting food aid. Food access is considered achieved when all members of a community, family, or household have the necessary resources (such as money) to procure the foods needed to sustain a healthy diet (Ogwal et al., 2022). Access to food is influenced by various factors, including market, social, and institutional entitlements, household income levels and distribution, food costs, and other determinants.

Households concerned about their food security may adopt several coping strategies to ensure they have enough to eat. These strategies range from maintaining usual financial activities, creatively managing resources, or selling off assets, to more severe measures such as selling productive assets like livestock or land, migrating, or facing destitution (Adem et al., 2018). Additionally, factors such as conflict, border closures that hinder seasonal labour migration, and the dismantling of safety net programs that once supported low-income populations can negatively impact people's ability to secure food (Hines et al., 2021).

Proper food utilisation necessitates access to clean water, adequate sanitation facilities, and a fundamental understanding of nutrition and health (WHO, 2019). The effectiveness of food utilization is influenced by factors such as food preparation and storage methods, the consumer's nutritional knowledge, and overall health (Gil et al., 2015). While growth requires an increase in nutrient intake, diseases that hinder nutrient absorption can impede this process. Endemic diseases, poor sanitation, lack of nutritional awareness, and culturally imposed dietary restrictions on certain age groups or genders within a household can lead to reduced food consumption.

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Fluctuations in production, prices, and income that households and individuals cannot adapt to can lead to food insecurity (Olayiwola et al., 2017). Substantial academic research highlights a strong correlation between food insecurity and declines in well-being at individual, community, and national levels. For instance, food insecurity has been linked to various negative health and nutritional outcomes across all age groups, including adults, children, and adolescents (Shanker et al., 2017; Burke et al., 2016). Members of food-insecure households typically have poorer overall health (Thomas et al., 2019; Naser et al., 2014) and face adverse pregnancy outcomes, such as low birth weight and gestational diabetes (Meza et al., 2019; Jones, 2017; Kazemi et al., 2020; Iqbal & Ali, 2021).

Food insecurity is significantly more prevalent in rural areas of Ghana compared to urban centres. Rural Ghanaians are often subjected to extreme poverty, which is considerably more severe than that experienced by urban residents. According to the CFSVA report, in 2009, 19% of rural households were food insecure, in contrast to 10% of urban households. Many impoverished peasant farmers in rural Ghana suffer from malnutrition, with a large number struggling to sustain their livelihoods (Headey et al., 2022).

2.4. Relationship between Migration and Food Security: Conceptual Considerations

The interplay between migration and food security is intricate and multifaceted, with each factor potentially either enhancing or undermining the other, thereby influencing overall outcomes. Both chronic and temporary food insecurity can drive individuals to migrate. Numerous studies have focused on the northern region of Ghana, where severe poverty and food shortages have compelled people to move to areas with more accessible food supplies. Migration has become a common strategy for families to cope with economic difficulties (Kline et al., 2017; Rademacher-Schulz et al., 2014). Ensuring reliable and adequate food supplies is crucial for

maintaining a healthy and stable society. However, factors related to food security in Ghana are anticipated to worsen due to climate change. Extreme weather events, such as floods, droughts, altered rainfall patterns, and high temperatures, are likely to adversely affect agricultural productivity and livestock survival. Additionally, climate change may exacerbate food insecurity indirectly by increasing the prevalence of pests and diseases that threaten crops and livestock.

Climate change may adversely affect the productivity of key cereal-producing regions in Ghana, potentially jeopardizing the availability of nutritious food. Severe natural disasters that disrupt transportation and other components of the food supply chain could further compromise access to adequate food. Additionally, climate change can impair nutrient absorption in the human body, which might influence dietary habits. Elevated temperatures and humidity could lead to spoilage of fresh produce and increase the risk of pests and diseases damaging stored food items, such as cereals, pulses, and tubers. Consequently, fluctuations in food supply and access driven by climate change, coupled with factors such as extreme poverty, environmental degradation, rapid urbanization, population growth, and climate variability, pose significant challenges to food security in Ghana.

The specific relationship between migration and food security is a relatively new area of study, but there is growing consensus in migration studies literature that migration is a complex phenomenon, rarely explained by a single factor, and the diversity of thematic areas of study is well appreciated" (Pendleton et al., 2014). Considering the food security dynamic and the scale of migration and remittance flows, one may infer a positive relationship between migration and food security in Ghana, even if no documented empirical link has been established. It is generally agreed that migration and remittances help alleviate poverty in rural areas and raise living standards for those left behind.

Remittances, or the money sent home by migrants to their loved ones, have been shown to enhance living standards in many low-income communities (FAO, 2019; Chiotani, 2020). Higher income and consumption levels are typical among migrant households (especially those receiving remittances) compared to non-migrant households (Awumbila et al., 2015; Hassan & Jebin, 2018; Damon, 2020). Several surveys of households have found that migrant families with remittances are more likely to invest their money in long-lasting purchases and income-generating endeavours than families without migrants (Démurger & Wang, 2016; Mahapatro, 2019).

Marginalised and impoverished individuals in rural areas, who are often undereducated and lack resources to improve their access to local assets, are particularly likely to benefit from remittances (Zhou et al., 2019; Ogunniyi et al., 2020; Abafita & Kim, 2014). However, assessing their ability to meet sufficient dietary needs remains challenging (Tripathi et al., 2019; Ensor et al., 2021).

The health of migrant farmers is frequently compromised by their relocation to areas with fragmented and inadequate infrastructure, such as urban centres or less developed rural regions. Farmers who face land taxes or need to borrow funds for purchasing fertilizers and other agricultural supplies often encounter difficulties adapting to crowded or inhospitable urban environments. Meanwhile, family members remaining in their home villages experience similar challenges in accessing sufficient nutrition, sanitation, and healthcare while relying on remittances from migrant relatives. As global population growth and climate change continue to threaten rural livelihoods, it is essential to understand the push and pull factors driving migration and relocation within different regions of Ghana.

Certain communities under study have identified migration as a key coping strategy (Schmidt et al., 2021). Historically, the term "travel and see" was used to evoke the notion of migration as an adventurous and pleasurable experience. However, contemporary research indicates that many individuals now migrate primarily in search of employment to support their families and acquire essentials such as food and shelter, often prior to marriage (Okin, 2015). Economic factors contributing to livelihood or food insecurity are prominent in several studies of environmentally induced migration in Ghana (Bukhari et al., 2020; Goldbach, 2017). In some regions of the Upper East, small-scale irrigation for dry-season tomato cultivation has emerged as a successful adaptation to local livelihoods, replacing traditional seasonal migration practices (Goldbach, 2017).

Migratory trends in rural communities, especially in northern Ghana, are influenced by factors such as the level of economic diversification and dependence on rain-fed agriculture. Communities with greater financial stability may be able to relocate family members as a risk management strategy, whereas those with fewer resources are less able to undertake such measures.

The effects of migration on both source and destination communities have been examined in depth. Although food security is a global issue, current literature lacks empirical data on how migration impacts households' food and nutritional security outcomes (Issahaku & Abdulai, 2020). Climate variability and change are expected to significantly disrupt agricultural production and food security in many African countries and regions. Specifically, in semi-arid and dry areas, agriculturally productive land, growing seasons, and yield potential are anticipated to decline. This decline exacerbates migration and undermines food security (Berhane, 2018). While many theorize about the link between food insecurity and migration, Dreby (2015) found

in his study in Malawi that it is often challenging to differentiate between migration driven by food insecurity and migration that occurs independently of household food supply status. Although other factors may influence migration, food insecurity is a significant motivator for those seeking work or better living conditions to mitigate hunger risk. Additionally, migration often happens regardless of whether food insecurity is present or absent, driven by the pursuit of opportunities elsewhere.

Several case studies have demonstrated a correlation between migration and food security. Dreby (2015), for instance, observes that when people cannot afford sufficient food, they often resort to strategies such as intensifying farming, generating additional income, taking on non-farm jobs or agricultural wage labour, or migrating to other rural areas in search of better land. The impact on households varies depending on the migrant's identity. It is generally recognized that the departure of young single women has less impact compared to that of married women, whose absence places additional burdens on remaining relatives, particularly female family members, who must manage childcare, household chores, and their existing farm responsibilities.

Additionally, it is commonly believed that migrants and non-migrants in rural destination areas have significantly different behaviours regarding resource use, extraction technologies, and local ecosystem knowledge (Golbach et al., 2018; Ofuoku & Emerhi, 2014). However, empirical evidence shows that resource usage can differ between migrants and non-migrants. Some studies have challenged the notion that migrant households are primarily responsible for environmental degradation, such as severe deforestation in environmentally sensitive areas like rainforests and wetlands (Masete, 2020; Kaenzig & Piguet, 2021; Hunter et al., 2015). Furthermore, the lack of local labour due to rural migration has negatively impacted resource conservation efforts in rural

areas (Massey, 2019; Qin & Liao, 2016; Tiwari & Joshi, 2015). This indicates that migrant and non-migrant households may manage resources differently.

The existing scholarship has explored the environmental impacts of rural migration by examining differences in resource utilisation and conservation between migrants and non-migrants in destination areas. Additionally, comparisons have been made regarding agricultural practices, technology use, income, consumption, and asset accumulation between migrant and non-migrant households in migration-origin regions. This study adds to the literature by comparing the effects of long-distance migration on food security with those of short-distance migration within regions. Most rural residents use migration as a coping mechanism, using remittances to alleviate food insecurity. As a result, societal improvement is essential to migration management (Vinke et al., 2020; Ooi et al., 2015; Moyo et al., 2020). Reforms in these areas have included the redistribution of land, the liberalisation of credit markets, the introduction of innovative technologies, and the enhancement of social services, including healthcare, education, and housing (Huggins, 2017; Dlamini, 2016). Both food insecurity and the response to food insecurity can be affected by migration. (Smith & Floro, 2020; Sadiddin et al., 2019).

2.4 Theoretical Underpinnings of the Study

Migration status can be categorised into migrants and non-migrants depending on their origin and destination. Household food security is measured based on whether the household is food-secured or food-insured. The relationship between migration status and household food security can be influenced by factors such as household size, household expenditure, remittances, climate change, and development zones in the following ways. Household size: Larger households tend to have higher food consumption needs and lower per capita expenditure, which can increase the likelihood of being food insecure. Migration can affect household size by reducing the number of

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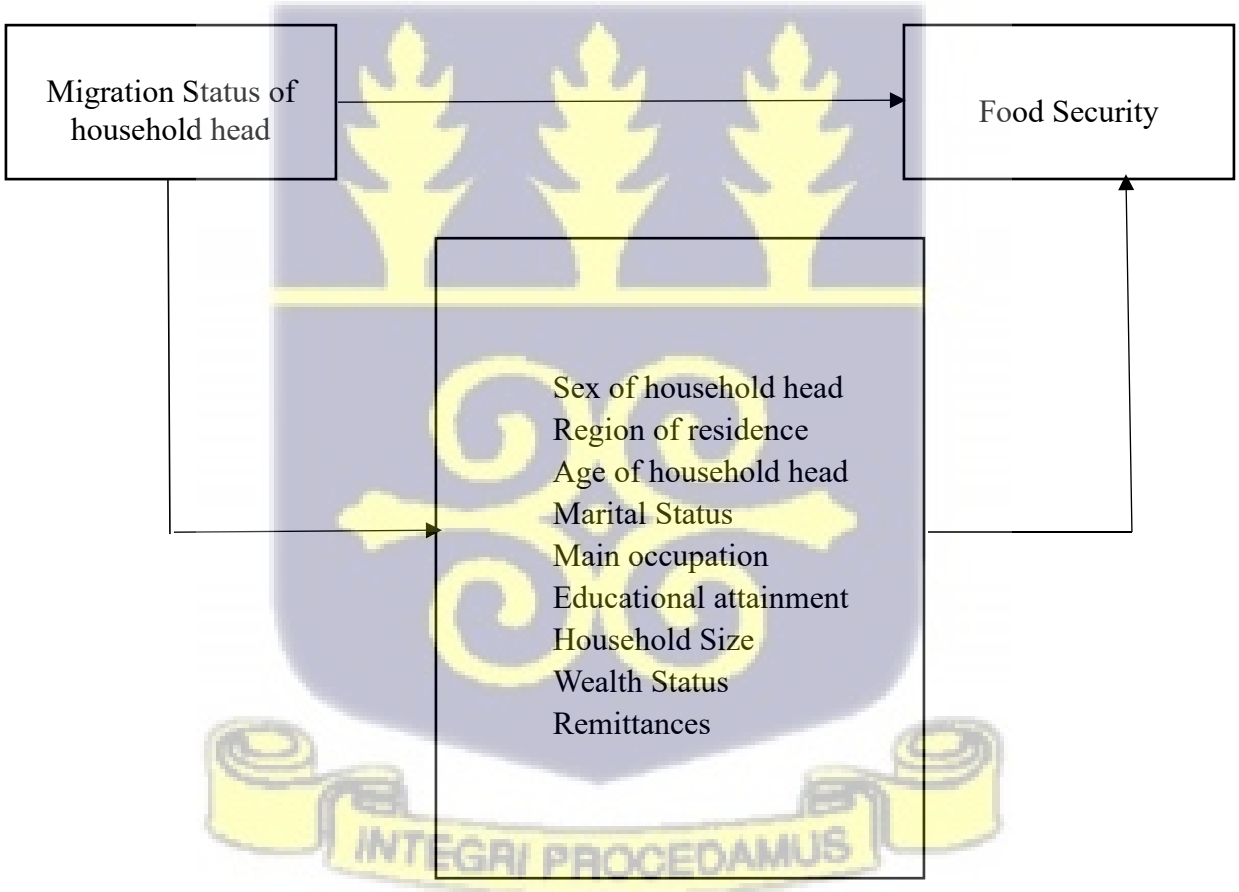
members in the origin or increasing the number of dependents in the destination. Household expenditure: Higher household expenditure can improve food security by increasing access to diverse and nutritious foods. Migration can affect household expenditure by increasing income through remittances or employment opportunities or by rising costs of living and transportation. Remittances: Remittances are money or goods sent by migrants to their families or communities of origin. Remittances can enhance food security by increasing household income, enabling investment in productive assets, and reducing vulnerability to shocks.

However, research indicates that remittances may negatively affect food security by diminishing the local labour supply, hindering educational opportunities, and slowing economic growth in the areas of origin. Climate change can impact food security by altering the availability and quality of natural resources such as land and water, and by increasing the frequency and severity of weather related hazards like droughts and floods. Migration can serve as a response to climate change, offering an alternative livelihood strategy or coping mechanism for affected households. Development zones—regions characterized by varying levels of socio-economic development, including income, education, health, infrastructure, and governance—can influence food security by affecting the availability, accessibility, utilisation, and stability of food systems. These zones also impact migration by creating disparities and opportunities for movement between rural and urban areas or regions. Consequently, rural out-migrants from northern regions are often less likely to experience food insecurity compared to their non-migrant counterparts or urban migrants from other areas due to the distinct characteristics of different migration flows and their effects on food security outcomes.

2.1 Conceptual framework showing the relationship between migration status and household food security issues.



Source: Author's construct based on literature review (2023)

The study employs the nexus between migration status and household food security to establish a conceptual framework that outlines the research process. The aim of this framework is to provide an overview of the study and a graphical representation that effectively summarises the topic. It seeks to integrate all components of the study and clearly present the steps involved in achieving the study's objectives.

Regarding this framework, the researcher highlights a nuanced relationship between household migration status and food security, based on traditional push-pull forces. Push factors, such as worsening domestic conditions, including unemployment, inadequate food production, poor agricultural yields, and erratic precipitation, compel people to migrate. Conversely, pull factors refer to the opportunities available in other locations, such as job openings, improved economic prospects, and better living conditions, which attract migrants (Kinuthiab, 2003; Awumbilia, 2008; Yeboah, 2008). These factors, along with access to social services like electricity and schools, contribute to an improved standard of living.

In addition to migration status, the model considers other influences on household food security. For instance, the gender of the household head is a significant factor, with studies indicating that female-headed households are more vulnerable to food insecurity compared to male-headed

households (Gebre et al., 2021). The region of residence also plays a role in predicting food security. Other variables taken into account include the marital status of the household head, their primary occupation, educational attainment, household size, wealth status, and whether the household head receives remittances.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter provides an overview of the study areas, details the data sources, explains how the variables were measured, and outlines the analytical methods used to select the study variables.

3.2 Description of Study Area Map

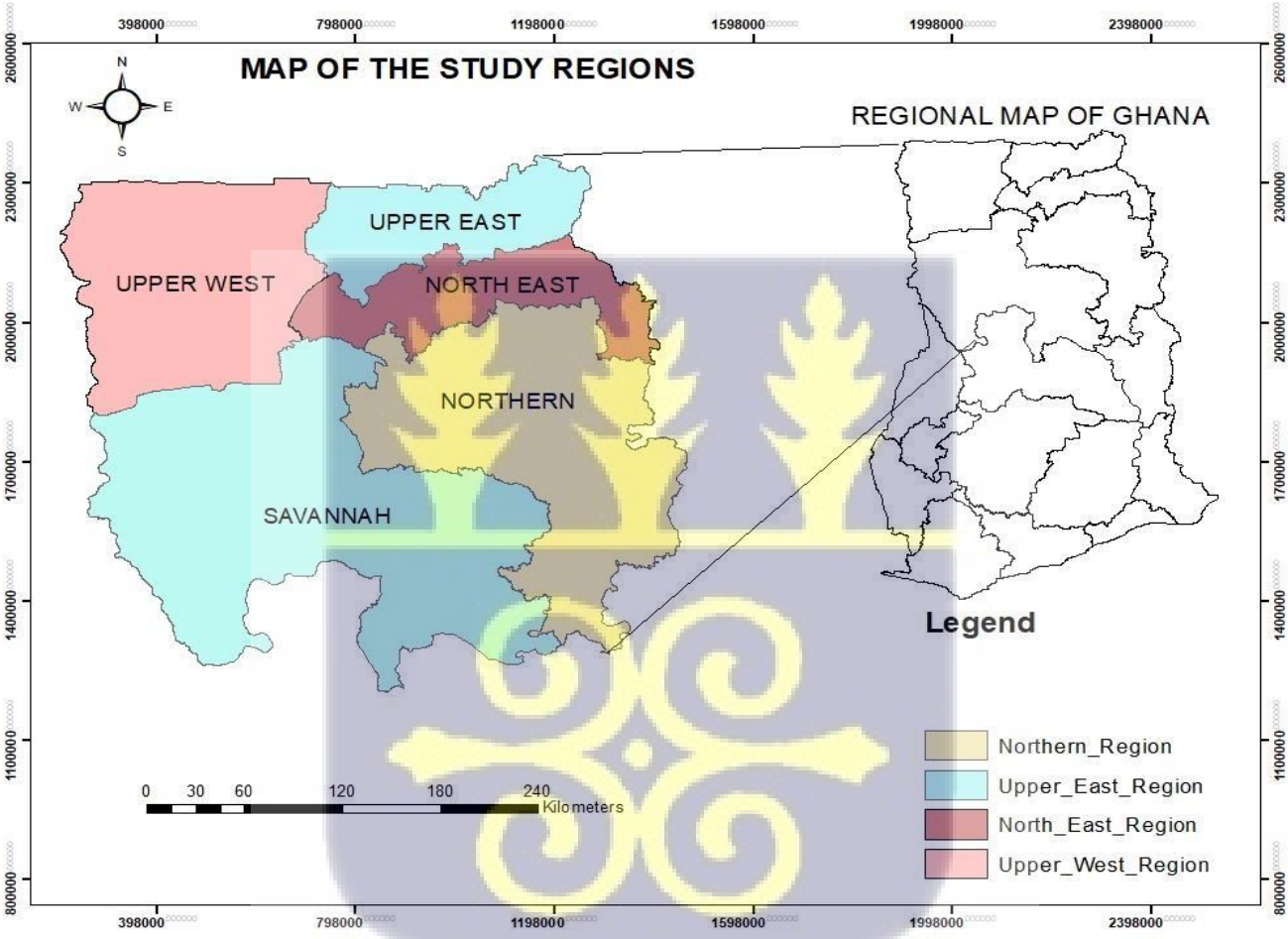


Figure 3.1: Map showing the Study Regions

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3.2.1 Study Area Description

Northern Ghana is one of the most ethnically diverse regions in the country, encompassing several ethnic groups that are often grouped together. This area includes the North East, Savannah, North East, Upper East, and Upper West Regions. According to the 2021 Population and Housing Census, Northern Ghana has an estimated population of nearly 5.8 million. The region features extensive savannah grasslands, a semi-arid climate, and a rich cultural and linguistic heritage. Economically, it plays a crucial role in agriculture and livestock production, contributing over half of the country's cereal production and nearly all of its maize, millet, groundnut, and sorghum production (Seglah, 2019). The region also produces livestock and livestock products, such as sheep, goats, and cattle (Ankrah-Twumasi & Jiang, 2021). The region also has large-scale mining operations for gold, diamonds, and manganese. The region also has a rapidly developing urbanisation and industrial sector, with several large-scale manufacturing operations (Forkuor et al., 2022). These include the textile, food processing, and pharmaceutical industries. In addition, the region has become an essential hub for the country's tourism industry, with several national parks and numerous cultural attractions. Overall, Northern Ghana is a dynamic and varied region with a broad array of economic and physical features. It is distinguished by its rich cultural diversity and its prominence in agriculture.

3.3 Sources of data

This study used secondary data obtained from the 2020 Ghana Comprehensive Food Security and Vulnerability Analysis (CFSVA) survey conducted by the Ghana Statistical Service (GSS), with technical and financial support from the World Food Programme (WFP) and the Food and Agriculture Organization (FAO). The CFSVA was designed to generate evidence-based insights into the profiles of vulnerable and food-insecure households across the country. Its primary objective is to inform food-related interventions and policy decisions aimed at improving household food security. As one of the most comprehensive food security

assessments undertaken in Ghana, the 2020 CFSVA covered all 260 districts and provided district-level data on household food access, availability, utilization, and vulnerability. The dataset used in this study is publicly available and was accessed as a secondary source for the purpose of analyzing patterns and determinants of household food security in northern Ghana.

3.4 Sampling size and design

The data analysed in this study were derived from the 2020 Ghana Comprehensive Food Security and Vulnerability Analysis (CFSVA), a nationally representative survey conducted by the Ghana Statistical Service (GSS). The original sampling design for the CFSVA was based on data from the most recent Population and Housing Census and the 2009 CFSVA Regional Food Insecurity Prevalence Data. The GSS employed a two-stage sampling method to ensure representativeness across all 16 administrative regions and 260 districts of Ghana.

In the first stage, 4,476 enumeration areas (EAs) were randomly selected from a national sampling frame of approximately 51,000 EAs. In the second stage, 15 households were randomly selected from each EA using a random number generator, based on a household listing compiled during fieldwork. Only the households preselected through this process were interviewed, and no substitutions were allowed, ensuring consistency and minimizing selection bias.

For the purposes of this study, a subset of the CFSVA dataset was extracted, focusing on the five northern regions of Ghana Northern, North East, Savannah, Upper East, and Upper West. These regions presented a sample size of 1,259,300 respondents selected from the five Northern regions. These respondents were selected because they represent the geographical and policy interest of the researcher, particularly in relation to food security challenges. Relevant variables aligned with the research objectives were also extracted and are presented in the subsequent section.

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3.5 Measurement and definition of variables

This section presents the description of information and measurement of the study's variables.

3.5.1 Dependent variable

The main dependent variable in this study is food security, consistent with the conceptual framework. The 2020 CFSVA dataset includes several indicators related to household food consumption, which were used to construct the food security variable. In the original dataset, household food security was classified into four categories: severely food insecure, moderately food insecure, moderately food secure, and severely food secure**.** For analytical clarity and to align with the study's objective of distinguishing between secure and insecure households, the categories were recoded into three groups**:** severely food insecure**,** moderately food insecure**,** and food secure (a combination of moderately food secure and severely food secure). This reclassification was guided by the understanding that in the context of sub-Saharan Africa where food insecurity remains a major developmental concern it is analytically meaningful to compare levels of insecurity against a clearly defined food secure group.

3.5.2 Independent variables

3.5.2.1 Migration Status

Migration status is the independent variable of interest for this study. Migration status is measured based on whether the respondent was born or has lived in the neighbourhood since birth. Individuals who were born in the village and were enumerated at the time of the study in the neighbourhood from which they were born were termed as non-migrants, whereas those who indicated that they were born in a different neighbourhood than the one from which they were enumerated were then referred to as a migrant. The categories were, therefore, binary and measured as migrants and non-migrants.

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3.5.2.2 Age

Various studies have demonstrated that, besides migration status, several other sociodemographic factors influence household food security. These factors include sex, age, educational level, region of residence, and household size. To prevent these variables from confounding the analysis, they were controlled for in this study. The age of the household head was measured in completed years but was recoded into three categories for this study: 1= Under 30 years, 2= Ages 31–50, and 3= 51 years and older. The sex of the household head was categorised as a dichotomous variable, with groups being male and female.

3.5.2.3 Marital Status

The respondents' marital status, a categorical variable, was classified as follows: 1 = Never married, 2 = Currently in a union, and 3 = Previously in a union. The respondents' educational levels in the CFSVA dataset were categorised as 1 = Never attended school, 2 = Primary, 3 = Secondary, and 4 = Tertiary.

3.5.2.4 Occupation

The respondents' occupation was also a categorical variable, recoded as 1 = Unskilled Labour, 2 = Skilled Labour, 3 = Farmer, and 4 = Unemployed.

3.5.2.5 Household size

In the dataset used for this study, the "household size variable" is a continuous variable, but it was treated as a categorical variable in this study. It was recoded as 1 = households with 1-3 members, 2 = households with 4-6 members, and 3 = households with seven or more members.

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3.5.2.6 Wealth Quantile

The wealth quintile of the households was computed to assess the household wealth grouping. The Principal Component Analysis (PCA) of a number of variables that measured household possessions was used for the computation of the household wealth quintile. The computed

variable (Wealth quintile) is then coded as 1 = Poorest, 2 = Poor, 3 = Middle, 4 = Rich, and 5 = Richest.

3.5.2.7 Religion

In furtherance, the respondents' religious affiliation was categorical, and for this study, this variable was coded as 1 = Christian, 2 = Muslim, 3 = Traditional, and 4 = No religion.

3.5.2.8 Region of residence

Lastly, the region of location was collected for all 16 regions in the country. However, due to the study's interest, only the five northern regions were selected. The codes for the region are as follows: 1=Northern Region, 2=Savannah Region, 3=North East Region, 4=Upper East Region, and 5=Upper West Region. Below is a tabular representation of the measurement of the explanatory variables used in the study.

Table 3.1: A tabular representation of the measurement of variables

Variable	Description (Measurement of Variables)
Age of household head	Originally captured as a continuous variable, this study recategorized them into those under age 36, those between 36 and 59, and those 60 and over.
Sex of household head	Dichotomous variable, male and female
Marital status of the household head	Categorical variable. Coded as 1= Never married 2=Currently married or in union. 3 = Formerly in union
Educational level	The educational level of the respondents was categorised as 1=No schooling, 2= Primary, 3 = Secondary, 4 = Tertiary
Main Occupation	This was a four (4) categorical variable. It was coded as 1= Unskilled 2= Skilled Labour, 3= Farmer, 4= Unemployed
Household size	This study measured it categorically, 1 = Less than 4 members, 2 = 4 to 6 members and 3 = 7 or more members

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Wealth Quintile	The household wealth quintile was computed using the principal component analysis (PCA) of several variables measuring households' possessions. The computed variable (Wealth quintile) is then coded as 1 = Poorest, 2 = Poor, 3 = Middle, 4 = Rich, and 5 = Richest.
Migration status	The household's migration status was measured based on whether any household member was not born in the neighbourhood. For this study, this was coded as 1 = non-migrant and 2 = migrant.
Food security	Measured as 1 = Highly Food Insecure, 2 = Moderately Food Insecure and 3 = Food Secure.
Region	The original dataset included all 16 regions of Ghana. But for the purpose of this study: The region variable was coded as 1=Northern Region, 2= Savannah Region, 3= North East Region, 4= Upper East Region, and 5= Upper West Region
Remittances	Measured as dichotomous: 1 = receipt of remittance support, 2 = No remittances

3.6 Methods of Analysis

Three levels of analysis—univariate, bivariate, and multivariate were employed to assess the relationship between migration status and household food security patterns, taking into account covariates or control variables. These analyses were conducted using the Statistical Package for Social Science (SPSS) version 23.

3.6.1 Univariate analysis

As the basic form of analysis, univariate analysis presented data in frequency tables and charts to describe the respondents' sociodemographic, socioeconomic and other background information. The relevance of the univariate analysis is to help understand the distribution of values for the variables and aid in summarising the data.

3.6.2 Bivariate analysis

The impact of the bivariate analysis was to test for association between the independent variables and the dependent variable. The bivariate analysis used was a cross-tabulation and a

Pearson chi-square test. The essence of a bivariate analysis is to examine the significant relationship between one independent variable and the main dependent variable.

3.6.3 Multivariate analysis

A multinomial logistic regression was used to predict the determinants of food security among the various independent variables. A multinomial logistic regression is a classification model used to determine the numerical relationship between a categorical dependent variable and the independent variables. A multinomial logistic regression was used as the main form of multivariate analysis. The essentials of a multivariate analysis are understanding and analysing the relationships and patterns among all the variables simultaneously. Unlike univariate analysis, which focuses on a single variable at a time, multivariate analysis examines how different variables interact and influence each other. Multivariate analysis enables a more comprehensive and holistic understanding of complex systems or phenomena by considering multiple variables together. It helps uncover hidden patterns, dependencies, and associations that may not be evident when isolating variables.

The equation for multinomial regression is: $Ln(pij/pik) = \beta j0 + \beta j1X1 + \beta j2X2 + \ldots + \beta jpXp$

Where:

- pij is the probability of observation i being in category j
- pik is the probability of observation i being in category k
- βj0 is the intercept for category j
- βj1 to βjp are the coefficients for the predictors X1 to Xp for category j

The logarithm of the ratio of probabilities (Ln(pij/pik)) is used so that the relationship between the predictors and the outcome is linear, which makes the coefficients easier to interpret. In a multinomial regression analysis, the dependent variable is the categorical outcome variable, and the independent variables are the hypothesised predictors associated

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with the outcome. The model is used to estimate the probability of each category of the dependent variable based on the values of the predictors. The coefficients for each predictor indicate the direction and strength of the association between that predictor and the outcome variable.

CHAPTER FOUR

BACKGROUND CHARACTERISTICS OF RESPONDENTS

4.1 Introduction

This chapter analyses and discusses the descriptive statistics of selected sociodemographic and socio-economic characteristics of the respondents relating to the independent, dependent, and control variables. Descriptive statistics are essential for analysing, summarising, and understandably presenting data. The results are displayed in frequencies, percentages, tables, and charts.

4.2. Migration status of head of household

Figure 4.1 shows that a large proportion of the respondents are non-migrants; the non-migrants constituted 83.7% of the total respondents, while 16.3% of the total respondents were migrants.

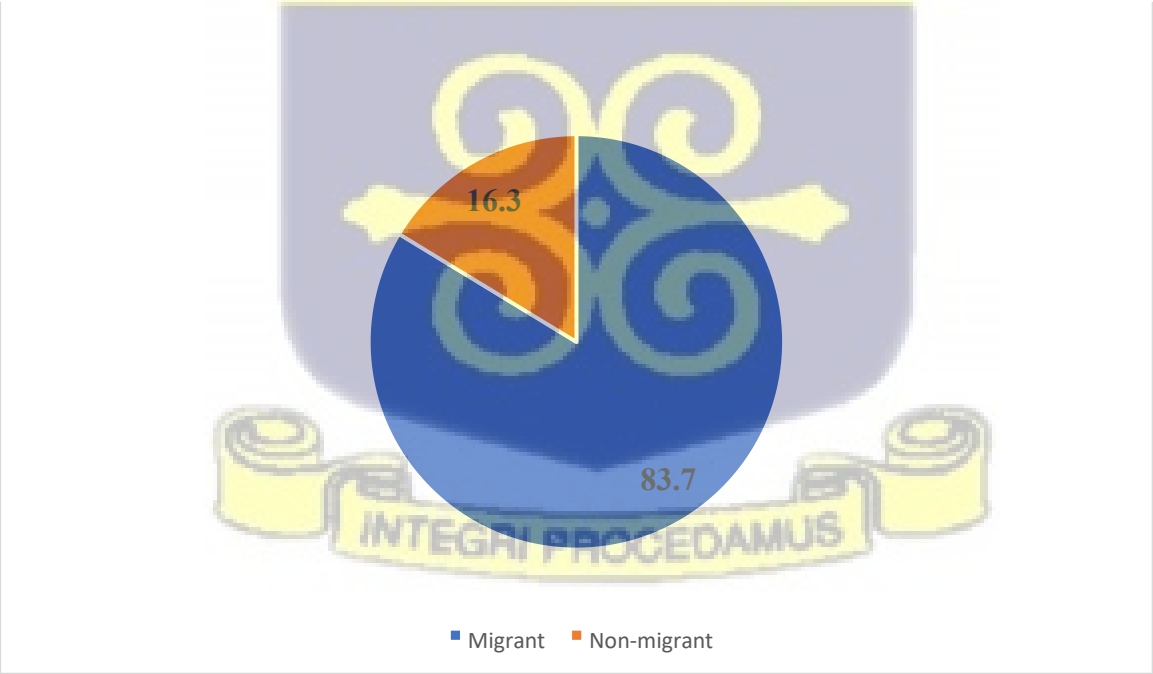

Figure 4.1: Migration Status

Source: 2020 CFSVA (2023)

4.3. Food Security

The results from the univariate statistics indicate that a large proportion of the residents (nearly 72%) were food secure. Nearly 17% of the respondents were moderately food insecure, while 11% were severely food insecure.

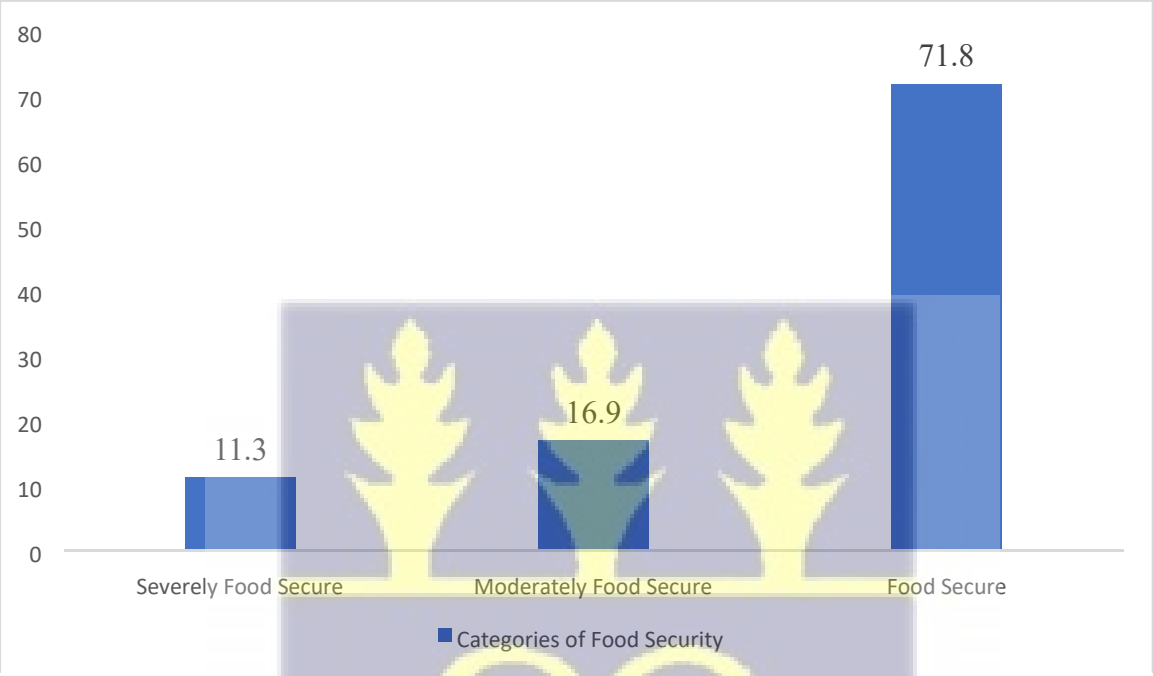

Figure 4.2: Food Security in Northern Ghana
Results tabulated from 2020 CFSVA (2023)

4.3.1. Sex Distribution of Household Heads

The results in Figure 4.3 show that a high proportion of the heads of the five northern regions were males (86.4%). Meanwhile, the remaining 13.6% of household heads are females. The patrilineal nature of the studied regions can explain this.

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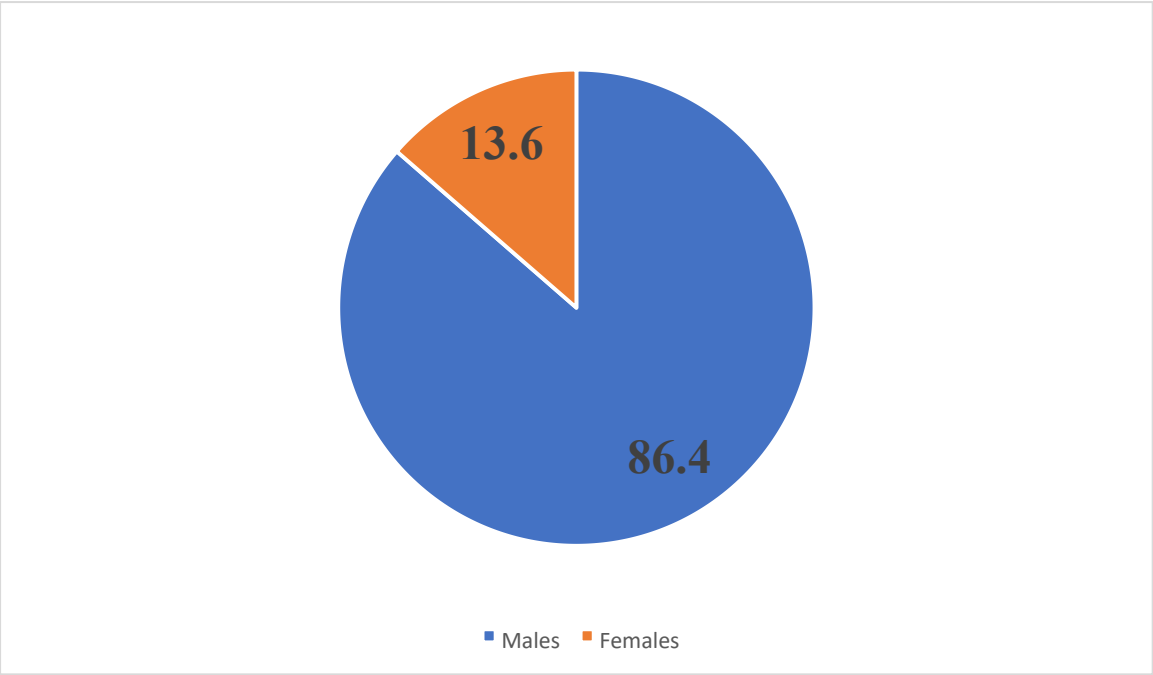

Figure 4.3: Sex distribution of household head
Results tabulated from 2020 CFSVA (2023)

4.3.2 Marital status of household

The data in Figure 4.4 show that nearly 90% of the respondents are married, 3% are not currently in a union, and 7.7% were formerly in union.

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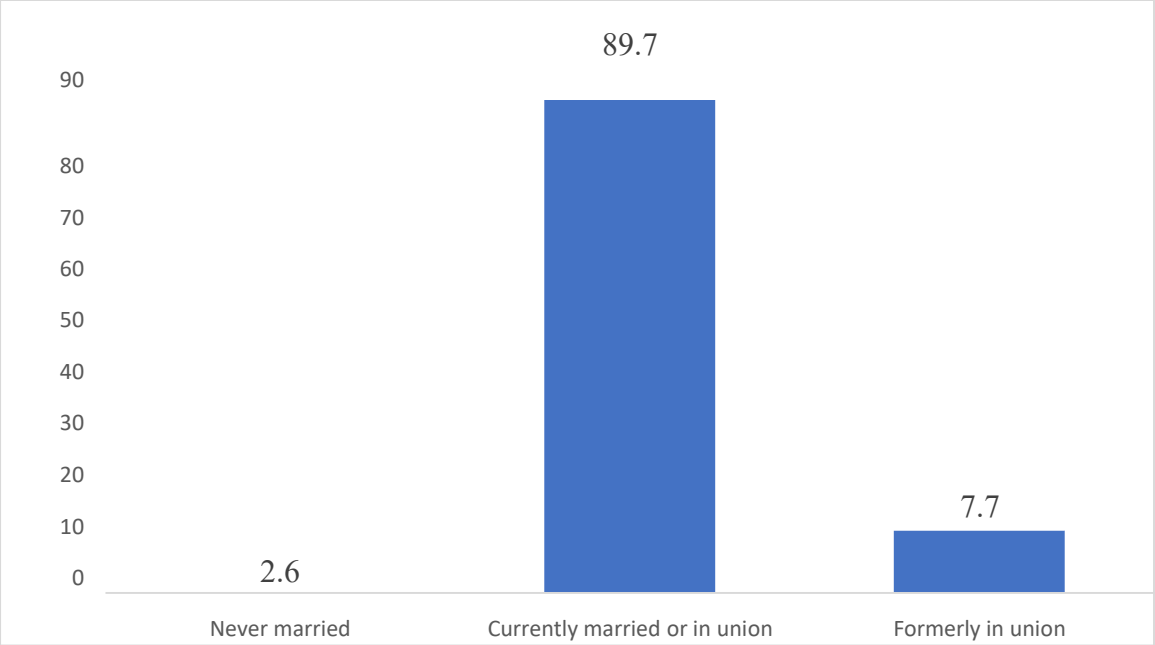

Figure 4.4: Marital status of household heads
Source: 2020 CFSVA (2023)

4.3.3. Educational attainment of heads of households

The univariate results indicate that nearly 63% of the heads of households reported having never been to school. 9.1% had attained primary school education, almost 19% had attained secondary school education, and almost 10% had attained tertiary school education.

4.3.4. Household Size

According to Figure 4.5, the univariate results show that 44.6% of the households surveyed had 4 to 6 members, 38.8% had 7 or more members, and 16.6% had 3 members or less.

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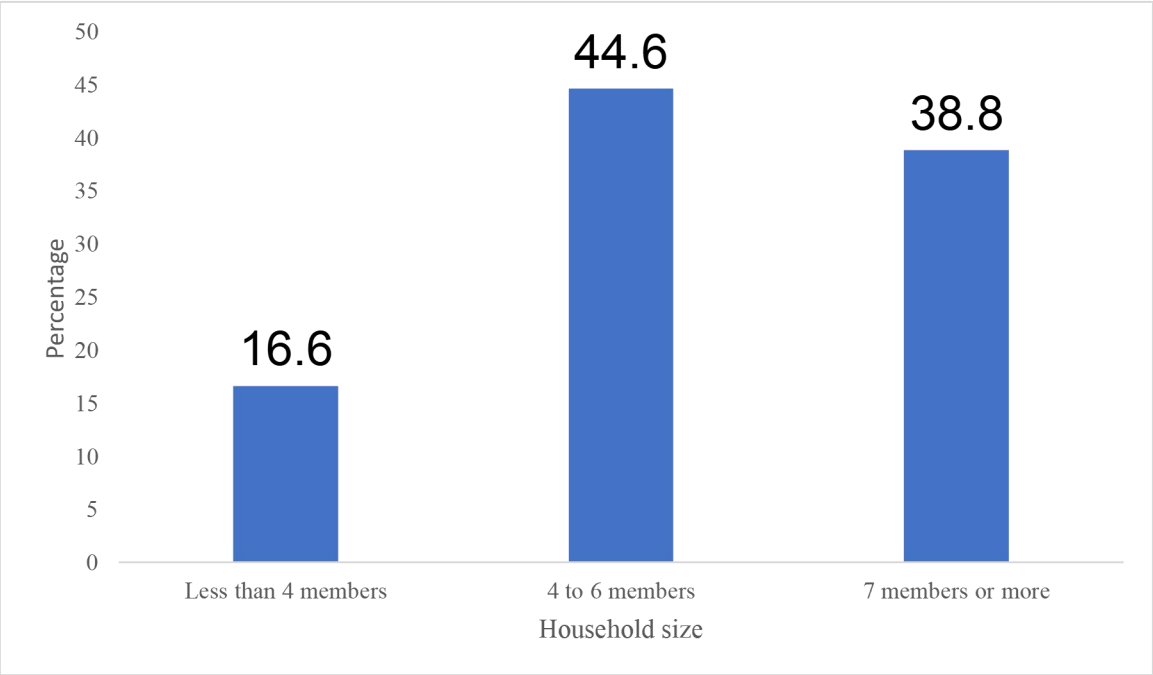

Figure 4.5: Household size

Source: 2020 CFSVA (2023)

4.3.5 Place of residence of household

The univariate analysis indicates that 37% of the households resided in the Northern Region. Comparatively, 25.3% of the respondents resided in the Upper East Region, 20.1% in the Upper West Region, and 10.9% in the Savannah Region. Notably, the North East Region had the smallest proportion of heads of households, with only 6.8% of the total respondents living there.

4.3.6. Occupation of heads of household

The occupation of the household head was univariately explored. The results indicate that nearly 17% could be classified as unskilled labour, 10% as skilled labour, 64% were farmers, and 9.5% were unemployed at the time of the survey.

4.3.7. Age of heads of household

Results from univariate analyses show that nearly half of the respondents were aged less than 30. 38.2% of the total sample were aged 31 – 50, while the remaining 12.6% of the head of household were aged 51 years and above.

4.3.8. Receipt of remittances

The receipt of remittances was analysed univariately. The results show that a large proportion of the household heads did not receive any remittance: 98.5% of the households did not receive remittances, while 1.5% of the households received remittances.

4.3.9. Wealth status of household

According to Table 4.1, 38.1% of the head of the household could be described as poorer, 32.1% as poorest, and 15.9% of the total respondents could be described as neither poor nor rich. 8.6% could be described as comparatively wealthier, while 5.4% could be described as the wealthiest.

Table 4.1: Frequency of selected independent variables

	Number	Percent
Marital Status		
Never married	3258	2.6
Currently in union	1129199	89.7
Formerly in union	97518	7.7
Educational attainment		
Never been to school	788436	62.6
Primary	114347	9.1
Secondary	236370	18.8
Tertiary	120147	9.5

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Region of residence		
Northern	465751	37.0
Savannah	137354	10.9
North East	85274	6.8
Upper East	318072	25.3
Upper West	252849	20.1
Wealth Status of household head		
Poorest	404198	32.1
Poorer	479582	38.1
Middle	199792	15.9
Wealthy	175,728	14.0
Age of household head		
Less than 36	797742	63.3
36 - 59	370311	29.4
60+	91247	7.3
Remittance Support		
Receipt of remittance support	19382	1.5
No remittances	1239918	98.5
Occupation of household head		
Unskilled	206559	16.5
Skilled	125814	10.0
Farmer	805464	64.0
Unemployed	121469	9.5
Total	**1,259,300**	**100%**

Source: 2020 CFSVA (2023)

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4.4. ASSOCIATION BETWEEN FOOD SECURITY AND BACKGROUND CHARACTERISTICS

4.4.1. Introduction

This section focuses on examining the bivariate relationships between the independent and the various dependent variables. A crosstabulation and chi-square were used to show the relationship.

4.4.2. Migration status and food security

The relationship between migration status and food security was tested at the bivariate level. Using a Pearson Chi-square, it can be observed that there is a significant relationship between migration status and food security. Based on the crosstabulation results, 11.8% of households with non-migrant heads were severely food insecure as compared to 9% of migrant household heads. Nearly 16% of households with non-migrant heads were moderately food insecure as compared to 23% of households with migrant household heads. Lastly, almost 73% of nonemigrant household heads were food secure as opposed to 68% of migrant household heads.

4.4.3. Sex of household heads and food security

Figure 4.6 demonstrates that there is a statistically significant relationship between the sex of the household head and food security, as evidenced by a p-value of 0.000. Out of households which were food insecure, 37% of those households were headed by males, while females headed the remaining 63%. For households considered moderately food insecure, 30% were

headed by males, and females headed the remaining 70%. Lastly, for households which were food secure, 29% were headed by males, while females headed the remaining 71%.

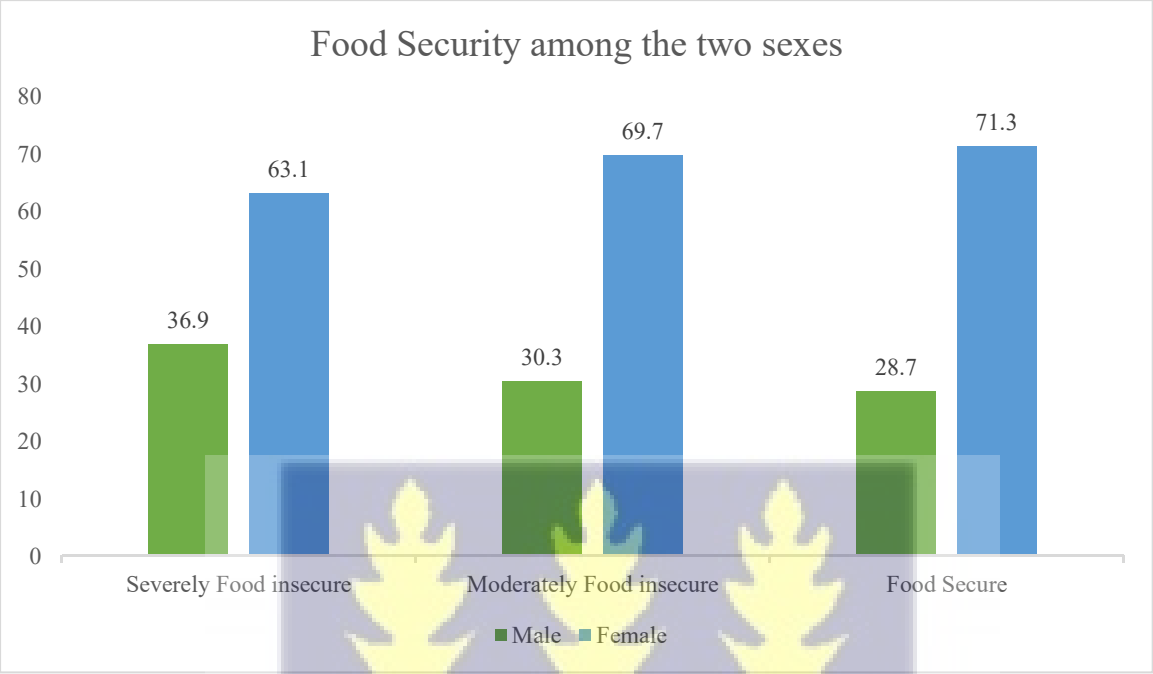

Figure 4.6: Bivariate results of sex of household and food security
P-value: 0.000

4.4.4. Region of residence and food security

At the bivariate level, the analysis revealed a statistically significant relationship between the region of residence and food security, with a p-value of 0.000 at a 95% confidence level. The results indicate that among households considered severely food insecure, 37% were found in the Northern Region, 30% were found in the Upper East Region, nearly 18% were found in the Savannah Region, 8.5% were found in the Upper West Region, and the remaining 6.2% were found in the North East Region.

Regarding the proportion of respondents or households who were moderately food insecure, 42% were located in the Upper East Region, 24% resided in the Northern Region, nearly 18%

were found in the Upper West Region, nearly 10% were located in the Savanah Region, and the remaining 6.3% were found in the North East Region.

Lastly, with regards to food secure households, 40% were found in Northern Region, nearly 23% were found in Upper West Region, nearly 21% were found in Upper East Region, 10% were found in Northern Region, and 6.9% were found in North East Region.

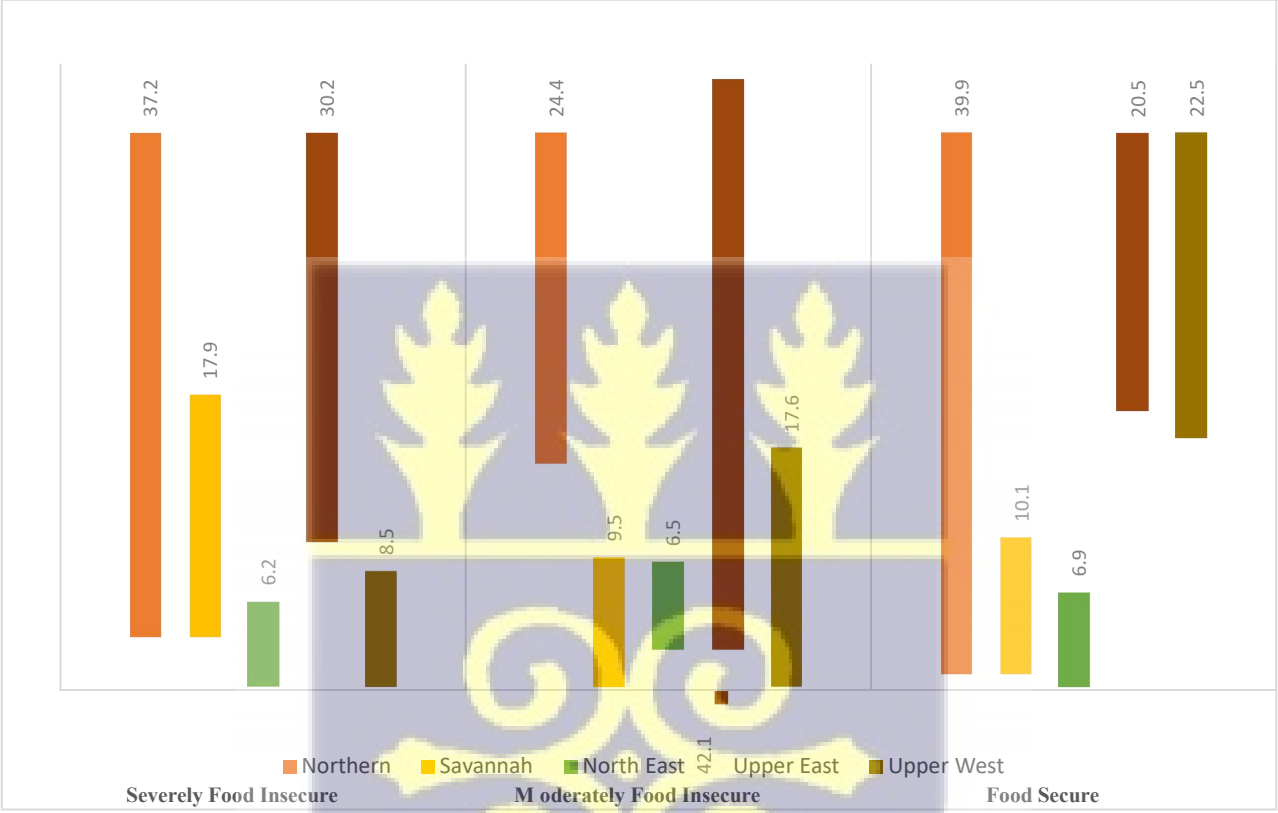

Figure 4.7: Bivariate results of regions and food security
P-value: 0.000

4.4.5. Age of household head and food security

As can be observed from Table 4.2, there is a significant relationship between the sex of household heads and food security. Nearly 12% of households with household heads under 35 were severely food insecure, compared to 16% who could be classified as moderately food insecure and 72.3% who were food secure. Similarly, nearly 11% of households with

household heads aged between 36 – 59 were severely food secure, 16% were food secure, and 73.1% could be classified as food secure. Lastly, 11% of households headed by household heads who were aged 60 or more could be described as severely food insecure.

4.4.6. Marital status and food security

The findings reveal that the highest proportion of households suffering from severe food security are those headed by those formerly in a union. 18% were severely food insecure, compared to 14.8% of households headed by household heads who are never married and 10.6% of households who are currently in union. Similarly, households with household heads who are currently in union are proportionally the most food secure. 73.3% of such households were food secure, compared to 61.3% of households headed by those never married and 54.4% of those formerly in a union.

4.4.7. Main occupation and food security

The bivariate results reveal a notable correlation between main occupation and food security. About 16% of households led by unemployed individuals were classified as severely food insecure, while nearly 12% of those headed by farmers and almost 10% of households with skilled manual labour leaders also experienced severe food security. In contrast, 9% of households with unskilled labour heads were severely food insecure. On the other hand, nearly 83% of households led by unskilled labourers were food secure, 72% of those with skilled labour heads were food secure, around 71% of households headed by unemployed individuals were food secure, and 68% of households led by farmers were food secure.

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4.4.8. Educational attainment and food security

The bivariate analysis indicates that households headed by individuals with no formal education experienced the highest levels of severe food security. Specifically, nearly 13% of

these households were classified as severely food insecure. Similarly, households with heads who have never been to school suffered had the highest proportion of those who were moderately food insecure. Households with heads who have attained tertiary education had the lowest proportion of being moderately food insecure. Households headed by those who have attained tertiary education were the most food secure, with nearly 90% being food secure.

4.4.9. Household size and food security

The findings show that households with less than four members had the highest proportion of severely food-insecure people. 13% of households with less than 4 members suffered from severe food insecurity, and 9.5% of households with more than 6 members suffered from severe food insecurity. However, households with four or fewer members were the most food-secure, as nearly 74% of households with less than 4 members were food-secure.

4.4.10. Wealth Status and Food Security

The findings show that a household head's wealth status is a strong predictor of food insecurity. It can be seen from Table 4.2 that the wealthiest did not experience any incidence of food insecurity. The wealthiest were the most food secure, followed by those who were wealthier.

Compared to the poorest, the poorer had the highest proportion of food insecurity sufferers.

4.4.11. Remittance receipt and food security

Table 4.2 shows that 5.8% of those who received remittances suffered severe food insecurity, and 16.8% of those who received remittances suffered moderate food insecurity. The findings also reveal that 11.8% of households that did not receive remittances were severely food insecure, while 19.8% were moderately food insecure. These findings suggest that

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remittances play a significant role in mitigating the effects of food insecurity at the household level.

Table 4.2: A bivariate table of the dependent variable against various independent variables

Variable	Severely Food Insecure	Moderately Food Insecure	Food Secure	P-value
Non-migrant	11.8%	15.7%	72.6%	.000
Migrant	9.0	23.0	68.0%	
Less than 35	11.7%	16.0%	72.3%	.000
36 – 59	10.9%	16.0%	73.1%	
More than 60	11.1%	22.9%	71.8%	
Never been to school	12.8	19.8%	67.4%	.000
Primary	8.3	17.6%	74.1%	
Secondary	11.7%	11.9%	76.4%	
Tertiary	3.7%	6.8%	89.5%	
Male	10.8%	16.2%	73.1%	.000
Female	14.6%	21.3%	64.1%	
No remittances received	11.4%	16.8%	71.8%	.000
Remittances Received	5.8%	19.8%	74.4%	
Never Married	14.8%	23.9%	61.3%	.000
Currently in union	10.6%	16.1%	73.3%	
Formerly in union	18.3%	27.3%	54.4%	
Less than 4	13.0%	12.4%	74.6%	.000
4 to 6 members	12.3%	16.8%	70.9%	
More than 6 members	9.5%	18.8%	71.7%	
Skilled manual	9.8%	7.6%	72.4%	.000

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Unskilled	9.4%	17.8%	82.6%	
Farmer	11.5%	20.9%	67.6%	
Unemployed	15.8%	13.3%	70.7%	
Poorest	10.8%	23.5%	65.7%	.000
Poorer	12.1%	24.4%	63.5%	
Middle	14.9%	0.00%	85.1%	
Wealthier	10.2%	0.00%	89.8%	
Wealthiest	0.00%	0.00%	100%	
Northern	11.4%	11.1%	77.5%	.000
Savannah	18.5%	14.6%	66.8%	
North East	10.4%	16.1%	73.6%	
Upper East	13.5%	28.1%	58.4%	
Upper West	4.8%	14.8%	80.4%	

Results tabulated from 2020 CFSVA (2023)

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CHAPTER FIVE

AN ASSESSMENT OF THE RELATIONSHIP BETWEEN HOUSEHOLD MIGRATION STATUS AND OTHER VARIABLES ON HOUSEHOLDS' FOOD SECURITY

5.1. Introduction

This chapter explores the multivariate relationship between the dependent, independent, and control variables. The dependent variable, migrant status, had three categories, which informed the choice of using a multinomial logistic regression. All the results tested at the bivariate level were significant, and hence, they were all included in the multivariate model.

5.2. Findings

Migration status significantly influences food security outcomes. Migrants tend to be more food secure than non-migrants. The regression analysis shows that non-migrants are 1.26 times more likely to experience severe food insecurity, suggesting that migrants possibly due to greater exposure to urban job markets or access to diversified income sources are better positioned to secure food for themselves and their households. Migration often facilitates access to improved infrastructure, better social services, and support networks, including remittance flows from family members. These factors can help buffer households against

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food shortages. Conversely, non-migrants, particularly those in rural or under-resourced areas, may face limited livelihood options and market access, contributing to their heightened food insecurity risks. Age plays a critical role in shaping food security, with younger individuals exhibiting relatively higher food security levels. People under 36 years are significantly less likely to experience both moderate and severe food insecurity than those aged 60 and above. This can be attributed to the economic productivity associated with youth. Younger people often have better health, mobility, and adaptability, which allow them to engage in more diverse and intensive income-generating activities. In contrast, older adults may face mobility challenges, limited employment opportunities, and health-related expenses, which can constrain their food purchasing power. This pattern underscores the need for age-sensitive interventions, such as targeted social protection schemes for the elderly. Education emerges as a strong protective factor against food security. Individuals with tertiary education are significantly more food secure than those with lower or no education. The data reveal that persons who have never attended school are 1.76 times more likely to experience severe food insecurity. Education enhances knowledge about nutrition, household budgeting, and access to employment opportunities. It also improves an individual's ability to navigate formal institutions such as financial services and government assistance programs. As such, investment in education especially for marginalized communities can have a long-term, positive impact on household food security. Remittances contribute substantially to household food security. The regression results show that individuals not receiving remittances are 2.61 times more likely to experience severe food insecurity. Remittances serve as a vital income supplement that can smooth consumption, especially during economic shocks, seasonal income fluctuations, or poor harvests. Households with remittances are often able to maintain dietary diversity, purchase food in bulk, and access healthcare, which indirectly supports nutritional well-being. In regions with limited employment or agricultural

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instability, remittances play a compensatory role that can stabilize food access. Marital status is positively associated with food security. Individuals in unions (married or cohabiting) are significantly less likely to suffer from both moderate and severe food insecurity. This could be because households with couples benefit from shared economic responsibilities and dual income streams, as well as mutual emotional and logistical support in managing food needs. Married individuals may also be more embedded in community networks and receive more external support during crises. On the other hand, those never married or separated may lack such social or financial buffering, increasing their vulnerability to food security. There are stark regional disparities in food security. Individuals residing in the Upper West Region are significantly more food secure than those in the Upper East, Savannah, and North East regions. For instance, those in the Upper East are over four times more likely to experience severe food insecurity. These patterns may reflect differences in agroecological potential, infrastructure, market access, and the reach of social protection programs. The Upper East and North East regions are prone to climatic shocks, such as droughts and floods, which severely impact agricultural productivity. Moreover, weak market linkages and underdeveloped food systems in these areas can limit food availability and affordability. Household size influences food security in complex ways. Smaller households (fewer than three members) tend to be more food secure in terms of moderate food insecurity but may be more vulnerable to severe food insecurity, possibly due to a lack of labor for income generation. In contrast, larger households may benefit from labor pooling and diversified income sources but also face higher food demand and dependency burdens. The relationship between household size and food security thus depends on the balance between resource inflows (income, labor) and consumption needs. Policymakers should consider household composition, not just size, when designing food security programs. Sex also affects food security, though in more nuanced ways. Males are 1.19 times more likely than females to

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experience severe food insecurity. This counters the often-held assumption that women are inherently more vulnerable to food insecurity. In some contexts, especially in rural areas, women may be more engaged in food production, household food preparation, and nutritional decision-making, which can positively influence food security. Moreover, women's participation in community support programs or savings groups may offer some protection. However, the absence of a significant difference for moderate food insecurity suggests that while gender influences food security under extreme conditions, it may not consistently shape day-to-day food access. Occupation type is strongly correlated with food security. Interestingly, unskilled laborers report higher levels of food security compared to skilled laborers and farmers. This may be because unskilled laborers in urban areas often earn regular, albeit low, wages that allow for more consistent food purchasing. Farmers, while food producers, are highly susceptible to seasonal variability, climate-related shocks, and market price fluctuations. The relatively greater food insecurity among farmers, particularly for moderate food insecurity, reflects the paradox of food producers lacking access to sufficient food themselves. Skilled laborers generally fare better in terms of moderate food insecurity, likely due to more stable income sources and job security. Wealth is one of the most critical determinants of food security. Individuals in the poorest and poorer wealth quintiles face the highest risk of both moderate and severe food insecurity, while those in the richest quintiles enjoy the greatest food security. Wealthier households can afford diverse and nutritious diets, maintain food stocks, and invest in food storage and transportation. They also have greater resilience to price shocks and income loss. In contrast, poor households often rely on a narrow range of inexpensive and less nutritious foods and are more likely to adopt negative coping strategies during food shortages. These findings highlight the importance of social protection and livelihood support programs to build resilience among low-income populations.

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MODEL 1 summarizes a multivariate result between food security and migration status **Table 5.1: Severely Food Secure as against Food Secure**

	Exp(B)	Lower Bound	Upper bound	Sig.
Intercept				
Non-migrant	1.26	1.24	1.29	.000
Migrant (RC)	1.00			

Table 5.2: Moderately Food Secure as against Food Secure

	Exp(B)	Lower Bound	Upper bound	Sig.
Intercept				
Non-migrant	0.65	0.63	0.68	.000
Migrant (RC)	1.00			

Table 5.3: Association between demographic characteristics and level of food security

				95% Confidence Interval for Exp(B)	
		Sig.	Exp(B)	Lower Bound	Upper Bound
Severely Food Insecure	Intercept	.000			
	Less than 36	.000	.956	940	.974
	36 - 59	.000	.883	.867	.899
	More than 60	.	.	.	.
	Never been to school	.000	1.758	1.678	1.842
	Primary	.226	1.132	.981	1.086
	Secondary	.000	1.470	1.402	1.541
	Tertiary	.	.	.	.
	No remittances received	.000	2.605	2.444	2.776
	Remittances received	.	.	.	.
	Never married	.000	.863	.830	.898
	Currently in union	.000	.575	.564	.587
	Formerly in union	.	.	.	.

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	Northern	.000	2.569	2.515	2.624
	Savannah	.000	3.978	3.882	4.077
	North East	.000	2.288	2.222	2.357
	Upper East	.000	4.017	3.930	4.105
	Upper West	.	.	.	.
	Non-migrant	.000	1.226	1.206	1.247
	Migrant	.	.	.	.
	Less than 3 members	.000	1.506	1.479	1.533
	4 to 6 members	.000	1.377	1.358	1.396
	More than 6 members	.	.	.	.
	Male	.000	1.192	1.168	1.217
	Female				
	Unskilled	.000	.223	.260	.331
	Skilled	.075	1.349	.999	1.506
	Farmer	.000	.695	.679	.712
	Unemployed	.	.	.	.
	Poorest	.000	4.987	3.987	6.898
	Poorer	.000	5.098	4.098	6.098
	Middle	.000	1.098	0.987	1.456
	Wealthy	.000			

Multivariate results showing the results of Moderate Food Insecurity as against the other variables

Moderately Food Insecure	Intercept	.000			
	Less than 36	.000	.638	.629	.647
	36 - 59	.000	.630	.621	.639
	More than 60	.	.	.	.
	Never been to school	.000	1.345	1.291	1.402
	Primary	.000	1.105	1.058	1.154
	Secondary	.000	.902	.865	.940
	Tertiary	.	.	.	.

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No remittances received	.000	1.428	1.369	1.490
Remittances received	.	.	.	.
Never married	.000	1.398	1.350	1.447
Currently in union	.000	.664	.651	.676
Formerly in union	.	.	.	.
Northern	.000	.912	.898	.926
Savannah	.000	1.243	1.219	1.268
North East	.000	1.088	1.064	1.113
Upper East	.000	2.906	2.865	2.949
Upper West	.	.	.	.
Less than 3 members	.000	.787	.774	.800
4 to 6 members	.000	.898	.888	.908
More than 6 members	.	.	.	.
Male	.337	.991	.974	1.009
Female				
Unskilled	.000	.434	.414	.456
Skilled	.000	.751	.703	.803
Farmer	.000	1.590	1.549	1.632
Unemployed	.	.	.	.
Poorest	.000	1.987	1.676	2.762
Poorer	.000	1.998	1.676	2.908
Middle	.000	1.023	0.987	1.234
Wealthier	.000	0.876	.0765	1.098
Wealthiest				
Middle	.000	1.023	0.987	1.234

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5.3. Discussion

Migration status and food insecurity are closely linked dimensions that significantly influence the overall well-being and health of individuals and households, particularly in vulnerable regions such as Northern Ghana. This study examined the relationship between the migration status of household heads and the experience of food insecurity, drawing on both bivariate and multivariate analyses. The results revealed several important insights, with socio-demographic and socio-economic characteristics emerging as critical determinants of food security among migrant populations.

A key finding from the analysis is that households headed by migrants are more likely to experience food insecurity—particularly moderate food insecurity compared to their non-migrant counterparts. This supports earlier findings by Rademacher-Schulz et al. (2014), who reported that immigrant households in Northern Ghana were disproportionately vulnerable to food insecurity, especially those with children. The present study adds to this body of evidence, emphasizing the continuing vulnerability of migrant households in the region.

Although the current study did not explicitly explore the duration of residence or migration history, insights can be drawn from related studies. For instance, Perez-Escamilla et al. (2019) found in the U.S. context that migrant households with less than ten years of residence were more food insecure than long-term residents. While not directly examined here, this perspective suggests that newly settled migrants in Ghana may also lack the resources and networks necessary for stable food access, potentially compounding their vulnerability.

Employment type and labour market participation are also crucial factors influencing food security among migrants. Many migrants tend to work in the informal sector, in low-wage or unstable jobs, which limits their capacity to consistently access sufficient and nutritious food. In the present study, migrant household heads engaged in sales-related activities reported the highest levels of food insecurity, followed by those involved in unskilled manual labour. These findings align with a study by Tuholska et

al. (2020), which reported that migrant-headed households in Accra working in low-income or precarious employment were significantly more food insecure.

The patterns observed in this study suggest that the intersection of migration, employment vulnerability, and limited socio-economic capital creates a precarious context for food security. Migrants often face barriers such as poor access to land, limited social support networks, and exclusion from key services all of which restrict their ability to secure consistent and nutritious food for their households.

Overall, the findings underscore the need for targeted interventions that address the unique vulnerabilities of migrant populations in Northern Ghana. Promoting sustainable livelihoods, improving employment opportunities, and enhancing access to social protection can help mitigate the food insecurity challenges disproportionately faced by migrant households.

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CHAPTER SIX

SUMMARY, CONCLUSION, AND RECOMMENDATION

6.1. Summary of main findings

This research sought to investigate food insecurity among households in the northern regions of Ghana. Three categories of food security were measured: severely food insecure, moderately food insecure, and food secure. First, the univariate results showed that a significant number of the respondents or people living in the sampled area have never been to school. Further, the dominant occupation in the area of study was farming.

At the bivariate level, it could be observed that severe food insecurity was highest among households headed by people less than 35. It is also observed at the bivariate level that females were proportionately more likely to suffer from food insecurity than their male counterparts. This can be attributable to the fact that females constitute a vulnerable population due to unequal access to economic resources. In patriarchal northern regions of Ghana, gendered norms and roles do not permit women to undertake specific jobs which are socially and traditionally cut out for males. These gendered norms and roles make women less likely to get employed, thereby predisposing them to higher food security (Bassist, 2018).

Further, the bivariate results show that those formerly in a union are more likely to experience food insecurity than those who have never married and are currently in the union. This can be explained by the fact that those formerly in union may have children to cater for

singlehandedly. Also, it was observed that larger households are less likely to suffer from incidences of severe and moderate food insecurity as they have more members capable of working to support the family financially. Lastly, at the bivariate level, it was observed that there is a significant relationship between a household head's wealth status and food insecurity. Poor people were deemed to be more food insecure than those who were neither rich nor poor.

Studies conducted in Ghana by Saaka (2016) show that the rich had access to more disposable income, and hence, their wealth gave them an advantage over poor ones, especially in the offseason when food prices shot up.

The multivariate results showed some interesting conclusions. Severe food insecurity could be observed among non-migrants as compared to migrants. However, migrant-headed households are more likely to suffer episodes than their non-migrant counterparts. Various studies from Smith & Wesselbaum (2020) and Atuoye et al. (2017), among others, have found that migrants are more likely to experience moderate episodic food insecurity due to various reasons. This is attributed to their slow adaptation to new foods in their new settlements. Another reason why migrants are less likely to suffer severe food insecurity is that a large proportion of migrants migrated for economic reasons, and even when underpaid, they can afford certain things they may not be able to afford in their home country. Equally, indigenous people comparison, do not suffer a lot from moderate food insecurity as they can rely on support groups.

Food insecurity is less prevalent in double-earning households than in households with only one breadwinner (Devereux et al., 2020). At the multivariate level, it was also observed that those in sales, religion, and unskilled labour professions were likelier to report high food insecurity than those in other professions such as farming, skilled labour, and technical.

Region or place of residence was a significant determinant of food insecurity. Savannah and Upper East Region were the most prone to incidences of food insecurity. Lastly, at the multivariate level, it could be found that the richer you are, the less likely you are to suffer from food insecurity.

6.2. Conclusion on the research questions

The hypotheses for this study were tested using results derived from the multivariate regression analysis. The findings offer important insights into the determinants of food insecurity in Northern Ghana, with particular attention to migration status, remittances, and educational attainment.

6.2.1 Relationship Between Migration Status and Severe Food Insecurity in Northern Ghana

The study reveals a complex relationship between migration status and food insecurity. Migrants are significantly less likely to experience severe food insecurity compared to non-migrants, suggesting that migration may serve as a coping or adaptive strategy that enhances access to livelihood opportunities, especially in urban areas. However, migrants are more likely to experience moderate food insecurity and are less likely to be completely food secure than non-migrants. This indicates that while migration can reduce the risk of extreme deprivation, it does not eliminate food insecurity, possibly due to economic vulnerability, informal employment, or limited social safety nets in host communities.

6.2.2 Association Between Remittances and Food Insecurity Among Migrants and Non-Migrants

Remittances play a crucial role in improving household food security. The analysis shows that households not receiving remittances are significantly more likely to experience both moderate and severe food insecurity. This underscores the importance of remittance flows as a stabilizing financial resource, particularly for households with limited income sources. Remittances can enhance

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purchasing power, ensure consistent access to food, and serve as a buffer during periods of economic shocks or agricultural shortfalls.

6.2.3 Educational Attainment of Household Heads and Food Insecurity in Northern Ghana

Educational attainment is a strong protective factor against food insecurity. The findings indicate that households headed by individuals with no formal education or only preschool-level education are the most vulnerable to both moderate and severe food insecurity. Conversely, the likelihood of experiencing food insecurity declines significantly with higher levels of education. Education likely improves access to better employment, income stability, and knowledge about food management and nutrition, thereby enhancing household food security outcomes.

6.3. Recommendations

Food insecurity remains a pressing challenge globally, disproportionately affecting vulnerable populations in regions such as Northern Ghana. The findings of this study highlight the high levels of food insecurity among both migrant and non-migrant households in the study areas. To effectively address the complex and multidimensional nature of food insecurity, the following targeted recommendations are proposed:

1. **Design and Implement Multi-Sectoral Interventions**

   Governments, non-governmental organizations (NGOs), and development partners should develop and implement coordinated, multi-sectoral strategies to address food insecurity. These interventions must engage key sectors including agriculture, health, education, and social protection alongside the private sector. Efforts should focus on improving food availability, access, affordability, and proper utilization, while addressing structural barriers such as market inefficiencies, transportation challenges, and seasonal food shortages.

2. **Scale Up Agriculture-Based Solutions**

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To enhance household food self-sufficiency and community resilience, governments and NGOs should promote agricultural interventions that increase productivity and sustainability. This includes supporting smallholder farmers with access to improved seeds, fertilizers, irrigation facilities, and modern farming technologies. Promoting climate-smart agricultural practices and enhancing access to agricultural extension services are also critical for building long-term food security.

3. **Strengthen and Expand Social Safety Nets**

   Social protection programs play a vital role in cushioning households against food insecurity, particularly during periods of economic stress or environmental shocks. Policymakers should strengthen existing safety nets such as the Livelihood Empowerment Against Poverty (LEAP) program while also introducing seasonal employment opportunities during non-planting periods. Expanding the school feeding program in food-insecure communities can further ensure children receive at least one nutritious meal per day, supporting both nutrition and school attendance.

4. **Invest in Education and Capacity Building**

   Low educational attainment is strongly associated with higher levels of food insecurity, as demonstrated in this study. Governments and stakeholders should invest in education at all levels, with particular attention to improving access and retention among children and youth in rural and food-insecure areas. In addition, capacity-building programs focused on nutrition education, financial literacy, and skills training can empower individuals and households to make informed decisions that improve their food security status and overall well-being.

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