

**UNIVERSITY OF GHANA  
CENTRE FOR MIGRATION STUDIES**



**GOVERNANCE, CLIMATE CHANGE AND MIGRATION IN  
THE UPPER WEST REGION OF GHANA**

**BY**

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA,  
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**DECLARATION**

I, Richard Seyram, hereby declare that except for references to other people's works, which have been duly acknowledged, this thesis is the result of my independent research conducted at the Centre for Migration Studies, University of Ghana, Legon, under the joint supervision of Professor Joseph Kofi Teye, Professor Joseph Yaro, Dr. Lily Salloum Lindegaard and Dr. Jarawura Francis. I further declare that as far as I know, this thesis has neither in part nor in whole been published, nor presented to any other institution for an academic award.



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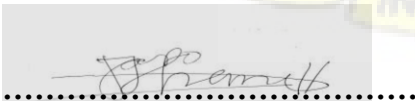
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## **DEDICATION**

I dedicate this work to my wife, Lydia Oduro and my children, Seraphine and Chris for their sacrifices and support throughout this academic journey. This work is also dedicated to Professor Joseph Kofi Teye for his invaluable support.



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## LIST OF ABBREVIATIONS

1D1F	One-District-One-Factory
1V1D	One-Village-One-Dam
CBOs	Community Based Organisations
CCAFS	Climate Change, Agriculture and Food Security
COPs	Conference of Parties
CSOs	Civil Society Organisations
DFID	Department for International Development
ECCU	Environment and Climate Change Unit
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organisation
FSP	Fertiliser Subsidy Programme
GCM	Global Compact for Migration
GHG	Green House Gases
GoG	Government of Ghana
IDMC	Internal Displacement Monitoring Committee
IGOs	Intergovernmental Organisations
IOM	International Organisation for Migration
IPCC	Intergovernmental Panel on Climate Change
MESTI	Ministry of Environment, Science, Technology and Innovation
MMDAs	Metropolitan, Municipal and District Assemblies
MoFA	Ministry of Food and Agriculture
MoFEP	Ministry of Finance and Economic Planning
NADMO	National Disaster Management Organisation
NAPs	National Adaptation Plans
NCCC	National Climate Change Committee
NCCP	National Climate Change Policy
NDC	National Democratic Congress
NGOs	Non-Governmental Organisations
NHIS	National Health Insurance Scheme
NMP	National Migration Policy
NPP	New Patriotic Party
NUP	National Urban Policy
PFJ	Plant for Food and Jobs
SARI	Savanna Agriculture Research Institute
SDG	Sustainable Development Goals
UNCCD	United Nations Convention to Combat Desertification
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commission for Refugees

## ABSTRACT

While literature is replete with studies on the role of governance (national policies and local institutions) in shaping the impacts of climate change on livelihoods and adaptation practices globally, scanty attention is, however, given to how national policies and local institutions shape climate-induced migration. This study, therefore, examined the possible links between national policies and local institutions, climate change and its impacts on livelihoods and migration in the Wa West District and the Jirapa Municipality of the Upper West Region of Ghana. The study relied on the Structuration theory and the Department for International Development (DFID) Sustainable Livelihood Framework to analyse the relationship between governance (national policies and local institutions), climate change and migration. Using the Sequential Explanatory Mixed Methods approach, the study employed a three-stage stratified sampling design to select 300 households from six communities in the Wa West District and the Jirapa Municipality. Focus group discussions, in-depth interviews and key informant interviews were used to obtain information from both respondents and heads of institutions. The findings indicated that the combined effect of climate and non-climate related hazards such as irregular rains, drought and declining soil fertility adversely affected crop farming and other livelihood sources of households in the study areas. The study again showed that households used seasonal migration as a strategy to deal with the negative effects of climate change on their livelihoods. For migration as an adaptation strategy, the role of migrant remittances was found as crucial. It was discovered that most economic migration were implicitly fueled by climate and environmental factors. The findings further revealed that national policies such as National Fertiliser Subsidy Programme, One-Village-One-Dam, One-District-One-Factory and the Savanna Accelerated Development Authority; and local institutions such as traditional land tenure system, family and friends (informal actors), Non-Governmental Organisations, and Agriculture Extension Services are not enhancing livelihoods of households hence, outmigration in the region is still being amplified as households need to diversify livelihoods. The study, on the account of these findings concludes that, despite the adverse impact of climate change on livelihoods, and the fact that migration is increasingly being used as a coping and an adaptation strategy to deal with this, governance (national policies and local institutions) is insignificantly shaping these contexts. The study, therefore, recommends that the National Development Planning Commission, Ministry of Environment, Science, Technology and Innovation, Ministry of Food and Agriculture, Ministry of Foreign Affairs and Regional Integration, Ministry of the Interior and the Migration Unit should collaborate and formulate a comprehensive policy and institutional framework that address climate-induced migration. Alternatively, the Ministry of Foreign Affairs and Regional Integration, the Ministry of the Interior and other agencies such as the Migration Unit should facilitate the establishment of the Ghana National Migration Commission to further trigger the operation of the National Migration Policy, which is expected to regulate all aspects of migration.

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## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background of the study

Climate change is one of the most challenging issues facing humanity today (Intergovernmental Panel on Climate Change, 2022). This is because it has already resulted in devastating impacts globally (IPCC, 2021; Krupocin & Krupocin, 2020). The recent increase in rainfall and temperature changes is attributed largely to the emission of greenhouse gases. Despite efforts to limit global average warming within 1.5°C and 2°C by 2030 and 2050 respectively (Friedlingstein et al., 2021), a recent IPCC report states that a 1°C global increase in temperature was already reached in 2017 (IPCC, 2021). The change in temperature has the tendency of shifting precipitation patterns by 2100 (IPCC, 2022). This level of warming is not only expected to trigger extreme weather events such as floods, drought, earthquakes, heatwaves and storms (Foresight, 2011; IPCC, 2021; Rigaud, 2021), but also, consequently, results in climate-related risks to human health, loss of livelihoods, food insecurity, water and resource scarcity, high poverty levels and human population mobility (FAO, 2017; Schroth et al. 2016).

According to IPCC (2014a) and Smith et al. (2009), developing countries have experienced and are still experiencing the harmful effects of climate change and variability. As expressed by Auffhammer (2018), Bird et al. (2017) and Tol (2018), developing countries with hotter weather conditions and poorer socioeconomic situations are disproportionately affected by climate change. Africa is regarded as the most vulnerable continent to the impact of climate change despite its limited contribution to the global greenhouse gas emission (IPCC, 2021; Onwutuebe, 2019). This vulnerability context stems from the fact that, two-thirds of the continent lies within the areas of arid and semi-arid, which most often, is considered as hotspot with increased climate

activities (UNESCO, 2012; Mendelsohn et al., 2006; O'Brien et al., 2004). Furthermore, the susceptibility of the continent to the adverse impact of climate change does not only stem from its low adaptive capacity caused by underdevelopment and poor governance systems (Bhatta et al., 2015), but also its over-reliance on rain-fed agriculture (Lobell et al., 2011; Niang et al., 2014; Stringer et al., 2009; Tschakert, 2007). Africa, over the years, has suffered from both sudden-onset and slow-onset climate and environmental events. Notable among these events are drought, floods, heatwaves, cyclones, storms, desertification, land degradation and earthquakes (Afifi et al., 2015).

Ghana continues to witness severe weather related events due to variations in temperature and rainfall across the three major ecological zones (Antwi-Agyei, 2021). Protracted droughts and heavy floods are the two main climate related activities that adversely affect lives and livelihoods in Ghana (MESTI, 2013), though several efforts are made to minimise their impacts (Teye et al., 2021). Ghana's vulnerability to climate change is typical of most African countries especially within sub-Saharan Africa, owing to its over-reliance on agriculture, which is considered as the main source of livelihood (see Teye & Owusu, 2015). Farming in Ghana is regarded as climate-sensitive because it is mainly rain-fed. The erratic rainfall and persistent drought conditions have often resulted in the low production of major crops that require an appreciable amount of rainfall to grow (Antwi-Agyei et al., 2012). The situation in the northern part of Ghana is more severe as these extreme weather events (floods and drought) result in crop failure, food insecurity, income losses, increased household poverty and outward mobility (Mohammed et al., 2021; Schroth et al. 2016; GSS, 2017; Teye et al., 2021).

Although global response to climate change and variability focuses on adaptation and mitigation (Adger et al., 2007; Fussel, 2007a; IPCC, 2007a), the former is highly considered as the

appropriate strategy in addressing the phenomenon in rural areas (Persson, 2019). Since farming households and communities are highly susceptible to the adverse effects of climate change, several strategies are adopted to reduce household vulnerabilities (Milan et al., 2016). In most African countries including Ghana, households usually adopt in-situ adaptation strategies which include irrigation, crop diversification, soil water conservation and management, integrating crops with livestock, tree planting, application of fertiliser on farms, and a shift from agriculture to non-farm jobs (Bawakyillenuo et al., 2016; Teye & Owusu, 2015; Fielmua, 2017). Additionally, historical accounts reveal that human migration has been part of life for many people (Black et al., 2011; Teye, 2017; Herrero-Arias et al., 2020), and has since become a major climate coping or adaptation strategy (Stapleton et al., 2017; Vinke et al., 2022).

Much as in-situ adaptation strategies are important, the role of migration or mobility in reducing vulnerabilities for some households is crucial. According to Zickgraf (2019), mobility practices in response to climate change comprise of displacement, migration and planned relocation. Among these, migration is commonly adopted as either a coping strategy or an adaptation mechanism against climate change (Martin et al., 2015). Studies have, however, shown that the nexus between climate change and migration is complex (Boas et al., 2019), as the decision to migrate is not unidirectional, but is shaped by existing socioeconomic situations, natural resource access and institutional and governance systems (Martin, 2017; Schade, 2013; Yaro et al., 2015). The complexity becomes more exacerbated in developing countries especially owing to their pre-existing socio-economic vulnerability (Niang et al., 2014; Shameem et al., 2014). The relationship between migration and climate change has, for the past decades, generated intense debate within the academic and the political circles, concerning the drivers and the estimates of the number of people who will migrate in response to climate change (Boas et al., 2019;

McLeman et al., 2021; Zander et al., 2022). This has resulted in increasing literature on climate change and migration, neglecting how governance plays into the link between the two variables.

Governance in the context of this study focuses on unpacking existing initiatives, policies, and institutional framework at local and national levels that shape livelihood resources, adaptation and migration decisions of households (Hoffman et al., 2019; Persson, 2019; Schewel, 2020; Thiede & Gray, 2017). Even though climate adaptation is framed as local and place-specific phenomenon (Burton, 2011, p. 481), with little focus on the global level, local and national levels strategies are the products of the global level policies and institutional frameworks. Globally, the UNFCCC, through its various arms such as the Cancun Agreement in 2010 and the Paris Accord in 2015, has featured prominently issues on adaptation and climate related migration governance. For instance, under the Cancun Adaptation Framework, Parties to the Convention were invited to enhance action on adaptation (UNFCCC, 2011). However, global adaptation governance has experienced a paradigm shift from the prominent climate organisational actors such as the UNFCCC and IPCC, to a hybrid multilateralism (Backstrand et al., 2017), involving Intergovernmental Organisations (IGOs) and Non-state actors in recent times (Persson, 2019). Of nearly 200 available IGOs, over 50 (consisting for example, of the Food and Agricultural Organization, the World Trade Organization, the International Energy Agency, the International Labour Organization) are involved in climate adaptation processes primarily integrating climate agenda in their core mandates (Dellmuth et al., 2018). For instance, the World Health Organisation (WHO) has started addressing adaptation even though that is outside its core mandates (WHO, 2014). Moreover, the European Union (EU) and the Pacific Island Forum (PIF) are largely involved in executing several adaptation projects through funding (Dellmuth et al., 2018; Persson, 2019). Generally, these IGOs employ the instruments of projects funding, idea

sharing, social shaming, and information dissemination to influence climate adaptation at local, subnational, national and global levels (Dellmuth et al., 2018). The IOM and UNHCR have been the major IGOs that deal with migration governance at all levels. Currently, the Global Compact for Migration (GCM) is regarded as the only global comprehensive framework with its core objectives to ensure safe, orderly and regular migration of all forms (IOM, 2020).

Africa's climate change adaptation governance resonates with the global system of governance, where the role of the IGOs and the non-state actors trickles down from the global level to the continent. More so, the continent relies on its National Adaptation Plans (NAPs) which emanate from the UNFCCC's Cancun Adaptation Framework at COP16 (Warner et al., 2015). Furthermore, the continent's drive to achieve the SDG 13: 'Take urgent action to combat climate change and its impacts' (Chevallier & Chesterman, 2022), has been the main motivation for drafting its "African Climate Change Strategy 2020-2030", which seeks to achieve Agenda 2063: by building the resilience of the African continent to the negative impacts of climate change" (Chevallier & Chesterman, 2022). For decades, the engagement of IGOs and non-state actors on climate adaptation in Africa has focused on major thematic aspects including economic stability, food security, water supply, health, energy, refugees and security (Biermann & Boas, 2010; Weitz & Persson, 2016). Aside from these, adaptation governance also captures other sensitive domains such as disaster risk reduction, migration, infrastructure, technological advancement and conservation of nature (Hall, 2016; Watson & Kellet, 2017; Davis & Johnson, 2016). For instance, in order to address the complex link between migration, desertification, land degradation and drought, the IOM and UNCCD, implemented a project in West Africa that sought to promote sustainable land management in migration-prone areas through innovative financing mechanisms, which lasted for two years (IOM, 2019). What is glaring on the continent

is the fact that governance factors and actors in governing climate change have prioritised in-situ adaptation strategies over explicit climate-induced migration policies.

In Ghana, the perspective of climate change adaptation and migration governance does not differ much from its regional context. The structure of adaptation governance in Ghana reflects its political system of governance, where national institutions such as Ministry of Environment, Science, Technology and Innovation (MESTI), Ministry of Food and Agriculture (MoFA), Environmental Protection Agency (EPA), Ministry of Finance and Economic Planning (MoFEP) and National Disaster Management Organisations (NADMO) formulate policies and programmes on climate adaptation that are implemented by Metropolitan, Municipal, and District Assemblies (MMDAs) and informal institutions at the local level (MESTI, 2013). However, because adaptation is local and place-specific, the role of informal institutions including chieftaincy institutions, family systems, migrant networks, hometown associations, and *tendaanas* is crucial. These institutions aid in shaping adaptation strategies and making existing livelihood resources accessible to climate affected households and communities (Agrawal, 2008). For instance, in northern Ghana, Chiefs and household heads play key role in land distribution as they are regarded as the custodians of lands. NGOs and the private sector have also spearheaded and implemented series of adaptation programmes in Ghana, particularly the northern part of Ghana (Yakubu et al., 2019; Yaro et al., 2016). Similar to the regional context, policies, programmes and initiatives of these national and local level institutions are tailored more to enhancing in-place adaptation than outmigration. This phenomenon has created a lacuna as far as explicit policy and institutional framework governing climate-induced migration is concerned. It is against this background that this study examines the relationship between

governance (national policies and local institutions), climate change and migration in the Upper West Region of Ghana.

### **1.1 Problem Statement**

In Ghana, the impact of climate change is continuously getting severer in the Savannah zones than the Coastal zone (Lawson et al., 2019), though current studies have also revealed similar tendencies in the Rainforest and Semi-deciduous Forest zones (Teye, et al., 2020). Since the 1960s, the mean annual temperature in Ghana has risen by 1.0°C, an average of 0.210°C per decade (McSweeney, 2020). Projection has it that temperatures will change by 2.00°C and 3.90°C in 2050 and 2080, respectively (EPA, 2011). Rainfall has also declined by 20 per cent since 1960, and it is projected to decline further by 9-27 per cent by 2100 (Minia, 2004). These changes are likely to exacerbate livelihood losses, reduce food security, increase household poverty and intensify existing outmigration (Bawakyillenuo et al., 2016; Teye et al., 2021).

The Upper West region is evidently one of the most vulnerable and highly susceptible regions to the impact of climate change in Ghana (Antwi-Agyei et al., 2021; Bawakyillenuo et al., 2016). This assertion is primarily due to rampant occurrences of negative climatic events such as drought, irregular rains, excessive heat, poor soil fertility, reduced food security, water stress, flood-induced displacement and increased transmission of vector borne disease, which have received limited government attention (Codjoe, et al., 2012; Fielmua, 2017; Teye et al., 2021; Yaro et al., 2016). Even though rapid onset climate event like flood does occur, the region is predominantly affected by slow-onset climate activities including drought and desertification (Antwi-Agyei et al., 2021; Debile, 2022; Teye et al., 2020). This is partly because the region is located within the semi-arid Guinea Savannah belt, with one season of rainfall from April/May to October (GSS, 2021; Rademacher-Schulz et al., 2014). According to Stanturf et al. (2011),

temperature in the region is projected to change by 2.10°C and 3.27°C in 2050 and 2080 respectively. This variation in temperature has been predicted to cause severe drought which will negatively impact socio-economic situations through loss of household livelihoods (Teye & Owusu, 2015), especially with over 80 per cent of the region's economically active population engaged in rain-fed agriculture (GSS, 2021; MoFA, 2021). According to GSS (2021), the Upper West is not only the poorest but also the most deprived region in the country, having nine out of every ten persons living on less than US \$1.90 a day.

In the region, individuals and households have, for several decades, undertaken outmigration and in-situ adaptation strategies to mitigate the vulnerabilities compounded by climate change and variability (Fielmua, 2017). Migration has been one of the alternatives, as it could be adopted as a coping strategy against sudden-onset environmental hazards such as floods or as an adaptation to slow-onset environmental processes including drought and desertification (see Teye, 2017). For instance, researchers have revealed that because of harsh climatic conditions and limited economic activities in the region, outmigration to the south and across the Ghana-Burkina Faso border has been a major coping strategy for many (Abdul-Korah, 2007; Fielmua, 2017; Kuuire et al., 2013; Luginaah et al., 2009; Tanle & Kyereme, 2014). However, current studies have also shown that rural-rural migration in a bid to diversify household livelihoods is on the increase (Fielmua, 2017; Tanle, 2014; Teye et al., 2021), though extensive human mobility has implications for both origin and destination areas (Aydemir & Duman, 2021; Teye et al., 2019).

In spite of the fact that households, for many years, have employed diverse strategies to deal with these climate perturbations, the region still records high poverty incidences (GSS, 2018), largely due to loss of agricultural livelihoods, lack of appropriate adaptation practices and poor governance response strategies (Fielmua, 2017; Tanle & Kyereme, 2014; Teye et al., 2021).

Furthermore, the inability of households to adapt properly to climate change is attributed to the lack of access to certain important livelihood resources such as land, finance, irrigation and extension services, hence leading to increased outmigration (Yaro et al., 2015). This brings to the fore the question of how governance (in this case, national policies and local institutions) has and is significantly shaping these climate change adaptation strategies and outmigration in the areas.

It is known in the literature that government institutions at the national level such as the MESTI, EPA, MoFA, MoFEP, NADMO and GIS have formulated policies such as NCCP, One-Village-One-Dam, One-District-One-Factory, NFSP, and SADA that give the roadmaps to address climate and environmental related challenges (MoFA, 2022). Furthermore, to address her internal and international migration flows, reduce poverty and sustain national development, the GoG formulated the National Migration Policy (NMP), as the first ever comprehensive and universal framework in the annals of Ghana. Pertaining to climate-induced migration, the policy recognises that migration can be a positive coping strategy if well managed, and can also aid in building resilience to climate and environmental changes (NMP, 2016). This is evident in the broad tripartite objectives of the policy including first, to increase the capacity of government to address migration, environment, and climate change; second, to assess the migration, environment and climate change nexus and its resulting impact; and lastly, to mitigate the causes and consequences of the migration, environment and climate change nexus (NMP, 2016). However, these objectives are not materialised as the policy itself is not yet implemented. This is because the Ghana National Migration Commission (GNMC), nursed to spearhead the implementation of the NMP is not established (Segadlo et al., 2021). As a corollary, the NMP is deficient in shaping climate-induced migration. The recently implemented 1V1D policy which is aimed at enhancing all-year-round agriculture production, increasing food crop production,

creating more jobs, and reducing seasonal migration augments the paucity of explicit policy framework designed to govern climate migration in Ghana. It is apparent that even recent policies are aimed at keeping people in their places.

As highlighted earlier, the local context of climate impacts makes the role of local institutions in governing climate change indispensable. For instance, the various departments at the MMDAs are involved in adaptive capacity building of climate-affected households. Whilst the department of food and agriculture is expected to educate farmers on new adaptation strategies such as the use of improved seeds, changing planting dates and fertiliser application, the district weather stations should be responsible for providing extension services (MOFA, 2018). Aside from that, NADMO is also recognised as a formal state institution that manages natural disasters. Their timely intervention enables affected households to recover from short-term shocks and retool themselves to recoup their lost assets (MESTI, 2013). According to Adaptation Learning Programme, 2015), to effectively implement a given adaptation strategy, the role of informal local institutions is paramount. In this regard, Yaro et al. (2016, p. 236) affirm that “informal institutions are the social cement that binds society together and are manifested in traditional governance systems, norms and cultural practices, social capital and networks that enable different livelihood arrangements”. Nonetheless, it can tangibly be seen from the above that local institutional programmes and interventions are geared towards enhancing more in situ strategies than ex situ practices which include migration.

Although there is abundant literature on the role of national policies and local institutions in shaping livelihoods and in-situ adaptation practices of climate affected households and communities (Adaptation Learning Programme, 2015; Antwi-Agyei et al, 2021; Bawakyellenuo, 2016; MESTI, 2013; Teye et al., 2020; Yakubu, 2019; Yaro et al., 2016), and migration as a

coping or an adaptation strategy to deal with the adverse effects of climate change (Adger et al., 2018; Call & Gray, 2020; Fielmua, 2017; Gemenne & Blocher, 2017; Jarawura and Smit, 2015; Musah-Surugu et al., 2018; Vinke et al., 2022; Zickgraf, 2021), little is known of how national policies and local institutions shape climate-induced migration. This study, therefore, examines the possible interplay between these national policies and local institutions, climate change and its impacts on livelihoods and migration decisions of households in the Wa West District and the Jirapa Municipality of the Upper West Region of Ghana.

## **1.2 Research Objectives**

The general objective of the study was to examine the relationship between governance (national policies and local institutions), climate change and migration in the Upper West Region of Ghana.

Specifically, the study sought to:

- (a) Examine the experiences of climate change and its impacts on livelihoods of households;
- (b) Assess how and the extent to which migration is used as a coping or an adaptation strategy to deal with the adverse effects of climate change;
- (c) Examine the role of national policies and local institutions in shaping livelihoods and climate change-induced migration.



### 1.3 Research Questions

In achieving these objectives, the following questions steered the study.

- (a) What are the experiences of households with climate change in the Upper West Region of Ghana?
- (b) How do households use migration as a strategy to deal with the negative effects of climate change in the Upper West Region of Ghana?
- (c) How do governance factors and actors shape climate change and migration decisions of households in the Upper West Region of Ghana?

### 1.4 Rationale of the study

Climate change threatens economic stability, ecosystems, water resources and food security and negatively affects major sectors like agriculture, health, infrastructure and energy through rising temperatures and rainfall variability in most developing countries including Ghana (Antwi-Agyei, 2021). The phenomenon in northern Ghana has resulted in the loss of agriculture livelihoods and non-farm livelihoods and high poverty incidence (GSS, 2018). In response, individuals and households have over the years predominantly used seasonal migration to deal with these climate perturbations (Mohammed et al., 2021). Despite these coping mechanisms, current studies have shown that the phenomenon continues to adversely affect livelihoods in the region (Teye et al., 2021). According to Mohammed et al. (2021), notwithstanding historical antecedent of human migration in the region, the continuous use of the phenomenon as an adaptation to climate impacts has been linked to the lack of access to major livelihood resources such as land, finance, irrigation, and extension services. This has tilted governance efforts towards the provision of extension services, farming input and dams, which foster in place

adaptation in the end (Teye et al., 2021). The fact that migration is still prevalent despite government adaptation efforts, arouses the interest and the need to define climate migration governance in the context of the role of national policies and local institutions. Some scholars like Teye et al. (2020), have attributed the phenomenon to limited understanding of how different governance factors and initiatives influence livelihood, adaptation and migration. Meanwhile, studies have shown that the efficacy of governance plays critical role in whether people will adapt in-situ, leave, return, or stay away indefinitely (Warner, 2013). This thesis, therefore, fills the gap by providing empirical evidence to enhance our understanding of how governance factors or actors and their activities can affect the ability of households to adapt in-situ to climate perturbations in order to shape outmigration. The study will also establish a contextual outline that can guide and augment further studies in this area of study. Finally, the findings would contribute to efforts to design policies to deal with climate change, migration and its governance perspectives.

### **1.5 Structure of the Thesis**

This thesis comprises of seven chapters. The first chapter introduces the study by giving the background and defining the problem statement of the topic under study. In the same chapter, the objectives that would be achieved by answering the research questions at the end of the study were also outlined. The chapter ends with an indication of how significant the study should be to policymakers, future researchers and the global community.

The second chapter presents a comprehensive review of relevant literature on the topic under investigation. Firstly, the study reviews literature on climate change and variability at the global level, Africa and Ghana. The chapter also reviews peer-review articles on the effects of climate change and variability on livelihood of households, experiences and perception of the

phenomenon by households, and climate change adaptation in Africa. The review also looks at literature on migration in Africa including Ghana, the nexus between climate change and migration and the extent to which migration is adopted as a coping or an adaptation strategy to deal with climate change. On governance, the study reviews literature on the impact of existing policy and institutional frameworks on climate change adaptation and migration in the context of Ghana particularly. The last section of the chapter looks at the theoretical perspective (Structuration theory) and the conceptual framework (DFID Sustainable Livelihood Framework) of the study.

The third chapter describes the study sites, and discusses the methodological techniques employed to examine governance (i.e. national policies and local institutions), experiences and impacts of climate change on livelihoods of households, and migration in the study areas. In addition, the chapter presents a description of the tools and techniques used for data collection and analysis. Finally, challenges encountered during data collection, ethical issues and positionality of the researcher are outlined in this chapter of the thesis.

Chapter four entails the analyses of the primary data based on socio-demographic characteristics of respondents, experiences of climate change and its impacts on livelihoods of households. The main sources of livelihoods of households and their perceptions about climate change are also analysed and discussed in this chapter.

The fifth chapter looks at how and the extent to which migration is used as a coping and an adaptation strategy to deal with climate change. Historical antecedents of climate change-induced migration, reasons for and main destination of migration, migration as a coping and an adaptation strategy, and causes of immobility of some household members form integral part of this section.

Chapter six presents the analyses and discussions on the role of national policies and local institutions in shaping livelihoods and climate change-induced migration in the study areas.

The seventh and the last chapter provides the summary, conclusions and recommendations based on the findings from the study.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter of the thesis reviews relevant literature on the concept of climate change, migration and governance to establish conceptual and theoretical frameworks for exploring the research objectives of the study. More so, the chapter identifies gaps in available literature that inform the objectives and methodology of the study. It focuses on bringing to bear the possible relationships between climate change, migration and governance in the Upper West Region of Ghana. The review looks at climate change at the global, regional (Africa), and national (Ghana) levels. Furthermore, literature on the impact of climate change on livelihoods in Ghana is reviewed. Along with this, the study reviews literature on the various constructions on how migration is considered as a coping or an adaptation strategy to deal with the adverse impact of climate change, and how governance (national policies and local institutions) shapes climate change and migration.

#### 2.1 Climate change and variability

Empirical evidences support the fact that the global climate has witnessed a drastic change in recent times. This phenomenal change is much attributed to natural and anthropogenic influences such as increased emission of greenhouse gases (GHGs) which include carbon dioxide, methane and nitrous oxides (Berrang-Ford et al., 2011). According to Shekhtman (2019), natural processes resulting in climate change may include internal variability (e.g., recurring ocean pattern like El Nino, La Nina and the Pacific Decadal Oscillation) and external forcing (e.g., volcanic activity, variations in the output of the Sun's energy, changes in the Earth's orbit). Deforestation and burning of fossil fuel are considered as the main human activities responsible

for the changes in the world's climate (IPCC, 2022). The current warming of the earth's atmosphere is directly connected to excessive build-up of greenhouse gases beyond the absorptive capacity of the earth (Dilling et al., 2015; Bui & MacDowell, 2022; Teshome, 2016). Climate change has, and will continue to affect the quality of the environment and various sources of livelihood across the globe (FAO, 2017; Schroth *et al.* 2016).

Several attempts have been made by scholars, institutions and policy makers to define this global phenomenon. This study, however, draws on the one given by the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC in its Article 1 defines climate change as, "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods" (UNFCCC, 2014, p. 1). The study adopts this definition due to its relevance in explaining anthropogenic and natural factors that result in climate change, which will aid in devising appropriate adaptation and mitigation strategies to minimise the adverse impacts of the phenomenon. In exploring the difference between climate change and climate variability, the study also adopts the IPCC's (2007b, p.78) definition given here as as "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and or the variability of its properties, and that persists for an extended period, typically decades or longer". This definition sheds light on 'climate variability', which alludes to short-term periodic or sporadic changes that occur.

Although the phenomenon has both positive and negative effects on human life and the environment, households and communities located in arid and semi-arid areas experience effects that are more adverse. Currently, the consequences of climate change and variability include but not limited to intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting

polar ice, catastrophic storms and declining biodiversity (Shekhtman, 2019). Studies have shown that these impacts result in climate-related risks to human health, loss of livelihoods, food insecurity, resource scarcity, high poverty levels and increased population mobility (FAO, 2017; Schroth et al., 2016). Countries with low or weak adaptive capacities (partly caused by poor governance systems) that greatly rely on climate-sensitive socioeconomic activities including rain-fed agriculture, feel the brunt of the adverse impact of climate change and variability (Das, 2016; Kima et al., 2015; Mendelsohn et al., 2006; Stringer et al., 2009).

The continent of Africa has been noted as the most susceptible to climate change and its effects albeit its limited contribution to the global greenhouse gas emission (IPCC, 2021; Onwutuebe, 2019). The continent is currently experiencing extreme temperatures, rising sea level and rainfall variabilities, which have consequently resulted in an upsurge in the frequency and intensity of natural disasters and greatly transforming the geography of the continent (IPCC, 2022). The recent natural disasters across the region include the destructive cyclones Idai and Kenneth, locust plague in eastern Africa and droughts in southern and eastern Africa that threaten the lives of millions; and the Sahel's desertification, which is contributing to conflicts and mass migration (Teye et al., 2022). However, a number of countries on the continent through international donor assistance and their own climate change mitigation measures have continuously undertaken greening of the Sahel (Chevallier & Chesterman, 2022; Codjoe & Atiglo, 2020; IPCC, 2022; SADA, 2016). The vulnerability context is attributed to a plethora of social, economic, governance, demographic and geographic factors (Chevallier & Chesterman, 2022). Notwithstanding, the geographical location of the continent is considered key in defining its vulnerability context. For instance, Africa is considered as the world's driest continent with 45% of its landmass lying within arid and semi-arid regions (UNESCO, 2012), a situation which has

exposed it to excessive climate change impact (O'Brien et al., 2004). More so, the susceptibility of the continent to the adverse impact of climate change does not only stem from its low adaptive capacity but also limited impacts of policy and institutional frameworks and its over-reliance on rain-fed agriculture (Bhatta et al., 2015; Lobell et al., 2011; Niang et al., 2014; Stringer et al., 2009; Tschakert, 2007). In the sub-Saharan Africa, agricultural activities are much vulnerable to the adverse effects of climate change especially with rain-fed agriculture yielding nearly 96% of the total crop cultivation (World Bank, 2015a). For instance, in the sub-Saharan Africa, crops and livestock production apart from pigs are mainly located in the semi-arid zones (Barrios et al., 2008). Moreover, over 40% of the population of Botswana depends on pastoral agriculture as the main source of livelihood, with the ownership of cattle serving as an important symbol of status and well-being for the greater number of the inhabitants of Kalahari (Dougill et al., 2010). There is no doubt agriculture is regarded as the mainstay of most economies in Africa, accounting for about 40% of foreign exchange (Ludi, 2009), and creating employment for the majority of Africans (Pretty et al., 2011). According to Niang et al. (2014) and Yaro et al. (2016), weak economic and political institutions coupled with frequent occurrences of climate stressors further deepen the vulnerability situation of the continent.

Studies show that there has been an upsurge of average temperature over the years, especially during the last 50 to 100 years, while total precipitation has witnessed a decline (IPCC, 2007a; Niang et al., 2014). Global climate models (GCM) have projected that temperatures in Africa are expected to rise to 1.7 °C by the 2030s, 2.7 °C by the 2050s, and 4.5 °C by the 2080 (Girvetz et al., 2017). Precipitation is, however, expected to decline in northern and the sub-Saharan Africa (SSA) by mid-21st century (Niang et al., 2014). In West Africa, however, it is projected that there will be an increase in temperature for twenty years than the average global temperature

(Niang et al., 2014). A plethora of studies conducted in Africa has revealed varied properties of rainfall variability across the continent over the years. According to Radhouane (2013), while rainfall figures have dwindled during summer in North Africa over the years, rainfall figures have increased during winter in other parts of the continent. Niang et al. (2014) stipulate that rainfall is projected to manifest adverse inclinations by the end of the twentieth first century in North Africa. A similar trend was noticed in West Africa, particularly in the twentieth century where rainfall declined and a notable rise in warm sensation was experienced (Boko et al., 2007 and Niang et al., 2014). Further projection reveals that the region is expected to witness wetter seasons with late onset of rainy season by the end of the twentieth first century (Girvetz et al., 2017).

Ghana continues to withstand the worst impact of climate change and variability. Like other countries in the sub-Saharan Africa, Ghana experiences tropical climate, a phenomenon attributed to the country's location above the equator of the earth. According to Stanturf et al. (2011), the variations in climate experienced across the length and breadth of the country are the result of the interaction of the North-East Trade Winds (NETW) and South West Monsoon Winds (SWMW) giving rise to the Inter-Tropical Convergence Zone (ITCZ), which consequently leads to variability in weather conditions. The dusty and arid harmattan formally called the NETW, emanates from the Sahara and blows over the country from December to March, and reduces the moisture content and visibility, creating hot days and cold nights in the northern sector of the country (GSS, 2014). On the other hand, the SWMW emanates from the Atlantic Ocean and brings moisture, which results in the inception of rains from October and November. The wet and dry seasons are influenced by the variations in rainfall and temperature.

With regard to agro-ecological zones, Ghana has been segmented into six different zones. The zones are demarcated by differences in their climate, vegetation and soil composition, which largely influence agricultural practices of farmers (MESTI, 2013). These ecological zones spread from down south to up north of the country as follows; the Coastal Savannah Zone, Rain Forest Zone, Semi-deciduous Forest Zone, Transition Zone, Guinea Savannah Zone and Sudan Savannah Zone. Each ecological zone has distinct experience of climate impact in all over the country (MESTI & EPA, 2015). According to EPA and MESTI (2015), the average annual rainfall between the Coastal Savannah Zone and the Rain Forest Zone ranges from 800 mm to 2, 200 mm respectively. Also, the Savannah zones (Sudan and Guinea) which are found in the northern sector of the country have a single season of rainfall that sets in May, reaches an apogee in August, and stays on till September. The southern and the middle sectors, which contain both rainforest and coastal savannah zones and the deciduous and transitions zones respectively, are characterized by two seasons of rainfall starting from April to July and September to November (MESTI & EPA, 2015). According to Bawakyillenuo et al. (2016), Ghana has witnessed a steady temperatures upsurge over the years, and it is anticipated that the same trends in temperature and rainfall will be experienced in future. An interesting dynamics noticed by MESTI and EPA (2015) revealed that for over five decades (from 1960 to 2010), there was a two percent (2%) change in the rate of minimum temperature in the southern and middle sectors of the country and about thirty-seven percent (37%) in the northern parts.

Projection indicates that Ghana is likely to witness a mean temperature upsurge of 1.02°C, 1.5°C and 1.8°C, by 2040, 2060 and 2080 respectively. In the Coastal Savannah Zone, the average minimum temperature has been predicted to respectively rise by 1.1°C, 2.5°C, 3.0°C, by 2040, 2060 and 2080. More so, it is anticipated that the average monthly temperature will increase by

1.2°C and 2.1°C by 2040 and 2060, respectively (Issahaku et al., 2016). The EPA and MESTI (2015) revealed that for a decade, the middle belt recorded a negative rainfall variation at almost three percent (2.8%), a positive value of thirteen percent (13%) for the south and 3.3 per cent for the north. Given the current variations in the climate, rainfall pattern for the future is indeterminate. According to Bawakyillenuo et al. (2016), it is anticipated that Ghana will witness a rise in the intensity of high rainfall occasions coupled with a cumulative fall in the number of rainy days within the same period. Across the country, projection indicates that rainfall will dwindle by 2.9 per cent by 2040, a phenomenon that is expected to be followed by an insignificant rise of 1.1 per cent in 2060 with a subsequent fall in 2080 by 1.7 per cent (MESTI, 2015). Furthermore, it is expected that the country will respectively witness a rise and fall in precipitation in the southern and northern parts (Codjoe et al., 2012 and Yaro et al., 2016). In Ghana, literature has revealed that intermittent rainfall, floods, and an upsurge in extreme weather events are the obvious indications of climate change and variability (see Teye & Owusu, 2015). These changes are likely to trigger negative tendencies such as livelihood losses, food insecurity and cause more people to consider migration as an alternative strategy to deal with these impacts (Codjoe & Atiglo, 2020; Yaro et al., 2016).

## **2.2 Effects of climate change on livelihoods of households in rural Ghana**

The impact of climate change and variability is not only widespread in Ghana but also permeates every sector of the economy, with the agriculture sector being the most affected due to its climate-sensitive nature (Antwi-Agyei et al., 2021; Baffour-Atta et al., 2022; Bawakyillenuo et al., 2016). Notwithstanding, the sector has been the major source of livelihood for rural households in Ghana, especially the northern parts for several decades (GSS, 2021). More so, households in the north particularly adopt supplementary off-farm livelihood sources such as

petty trading, pito brewing, charcoal production, shea butter making and weaving; and non-farm strategies including civil service, construction and migration (Aniah et al., 2016; Antwi-Agyei et al., 2021; Fielmua, 2017; Tanle & Kyereme, 2014; Teye et al., 2021). In recent times, however, households and individuals are engaging in stone collection, cashew nut picking and illegal mining (galamsey) as their alternative sources of livelihood (Teye et al., 2021). Agriculture continues to play an important role in Ghana's economy. It contributes nearly 20 percent of the Gross Domestic Product (GDP) and also employs about 42 percent of the workforce (Government of Ghana, 2020, GSS, 2019, World Bank, 2019). The sector also accounts for more than 30 percent of export revenue and serves as the main raw material base for the manufacturing industries (MoFA, 2020). According to the Food and Agriculture Organization (2018), about 60% of all farms in the country are less than 1.2 hectares in size, 25% are between 1.2 to 2.0 hectares, with about 15% above 2.0 hectares. The sector also accounts for about 80% of total agricultural production in the country (GSS, 2019; World Bank, 2019).

In spite of its contribution to agricultural production, peasant farming in rural households is severely affected by climate change and variability due to its over-reliance on rainfall (Aniah et al., 2016). In addition to the sector's vulnerability to climate change, peasant farmers commonly use elementary tools and technologies resulting in continuous decline of agriculture produce in Ghana. Aside from this, majority of smallholder farmers do not have access to irrigation facilities as farmlands under irrigation in Ghana are only about 3 percent (MOFA, 2016). This does not only present a disturbing situation considering the crucial role peasant farmers play in food crop production, but also raises important question of the role of governance factors in shaping agriculture livelihoods in Ghana (Asare & Ebo, 2019).

As indicated earlier, climate hazards such as drought, extreme temperatures, fluctuating rainfall and floods are usually experienced in Ghana and have adversely affected agriculture livelihoods particularly in the northern zone (Aniah et al., 2016; Baffour-Atta et al., 2022; GSS, 2018; MoFA, 2021). However, studies have shown that these climate-related hazards have resulted in other non-climate-related hazards such as declining soil fertility, crop pests and diseases, livestock diseases, low or poor output sales and conflict over land which equally affect livelihoods (Antwi-Agyei, 2021; Derbile et al., 2022; Kebede, 2019; Scheiterle, 2019). For instance, studies have shown that extreme droughts in the northern part of the country have led to excessively high temperatures, very low soil water holding capacity and poor soil fertility, subsequently resulting in low farm yields (Derbile et al., 2022; Kebede, 2019; Mabe et al., 2012). A study conducted by Boyd et al. (2013), revealed that within a period of two decades, the northern part of the country widely known for the production of legumes and grains on a large scale, owing to severe climate hazards, witnessed a decline in production from nearly 40 percent to 25 percent. More so, climate change and extreme weather events such as drought and floods respectively resulted in 6.3 percent and 9.3 percent decline in maize and rice production in Ghana (Stutley, 2010). This phenomenon has consequently led to increased food insecurity, poverty and loss of livelihood, especially among people in rural areas whose main source of livelihood is rain-fed agriculture (Asare & Ebo, 2019).

Relative to the south, the northern part of Ghana is evidently the most vulnerable to climate change and variability (Antwi-Agyei et al., 2019). This part of the country which covers almost one-half (47%) of the total land size, witnesses severe climate impact due to its location within a semi-arid climatic zone, and also, its closeness to the Sahara desert and the Sahel (Bawakyillenuo et al., 2016). According to the IMF (2015), the northern part is noted as the

poorest in Ghana, with the northern region and the Upper West Region recording a poverty rate of 44.4 percent and 70.7 percent respectively. Like other parts of the northern zone, studies have revealed that in the Upper West Region, livelihood activities negatively affected by climate change are crop farming, livestock production, fishing, agriculture labour businesses, pito brewing, malt processing, and shea butter processing (Aniah et al., 2016; Antwi-Agyei & Nyantekyi-Frimpong, 2021; Fielmua, 2017; Teye et al., 2021).

Given the current and future variations in rainfall and temperature reported by the Ghana Meteorological Stations, postulations of climate change scholars, and farmers' perceptions on the phenomenon across the country, it is expected that the impact of climate change and variability on agriculture livelihoods of rural households will be devastating. The vulnerability that may emerge from these climate perturbations may compel households and individuals to devise strategies including migration to minimise it. The Upper West Region, therefore, provides a suitable case-study context where governance, adaptation practices and migration to mitigate these adverse impacts will be explored.

### **2.3 Experiences and perceptions of households on climate change and variability**

Though experience has diversely been defined, this study draws on the one put forward by Lau et al. (2022) stated here as, “an encounter, interaction, or skill developed through direct contact with an infrastructure, space, place, person, event, or situation” (p. 479). As households practically encounter and interact with climate events over a period of time, a first-hand experience is acquired. In this regard, Shekhtman (2019) posits that experiences of people with climate change and variability are built around intense drought, floods, rising sea levels, irregular rainfall and extreme temperatures, catastrophic storms and declining biodiversity. This phenomenon, according to Samuel et al. (2020), forms the basis of farmers' perception about

climate variability and its impacts on livelihoods. Perception or social perception has been defined as “the process of interpreting information about another person” (Nelson & Quick, 1997, p. 83-84). This definition seeks to communicate the fact that the opinions one forms about another is determined by the expanse of facts accessible to the person and the degree to which the individual is able to properly understand the information he has acquired (Nelson & Quick, 1997). In the words of Rao & Narayan (1998), “perception is the process whereby people select, organise, and interpret sensory stimulations into meaningful information about their work environment” (p. 329-330). Perception, therefore, plays a significant role in human decision-making. This presents an opportunity to examine the impacts of household perceptions and experiences with climate change on livelihoods.

Several studies have shown that the response of people especially local peasant farmers to the impact of climate and environmental changes is critically dependent on the perception of the phenomenon (Codjoe et al., 2014; Fosu-Mensah et al., 2010; Yaro et al., 2013). As argued by Wilkinson et al. (2016), policy intervention should begin at the local and community levels, since community knowledge, perception and participation are key to ensuring the success of such interventions. Fosu-Mensah et al. (2010) in a similar manner have posited that it is prudent for policymakers to give priority to the experiences of farmers about their knowledge and opinion on climate change, adaptation strategies and likely challenges of these strategies. Sikha et al. (2020) also affirm that, “local context is critical for adaptation planning in the agricultural sector as the vulnerability of farmers (in terms of their sensitivity and vulnerability) is influenced by their experiences and perceptions” (p. 81). This phenomenon in my purview will foster the implementation of strategies that are suitable and produce the desired result for farmers.

Perception of climate change and variability is diverse across the globe. Adger et al. (2021) opine that whilst Africa and Latin America see climate change as a major problem, the developed countries who are the major emitters of Carbon Dioxide pay less attention to the phenomenon. Additionally, developed countries perceive climate change as a misfortune, which they cannot suffer both spatially and temporally (Riguard, 2018). According to Knight (2016), despite the level of awareness and the exposure richer countries have about the phenomenon, poorer countries tend to be more concerned as they feel the brunt of the impact of climate change. Even though higher GDP countries also perceive climate change as a critical issue, most often, they consider it less hazardous (Lo & Chow, 2015). This could be attributed to the well-established institutional and governmental fronts that devise appropriate adaptation strategies for households and communities affected by climate change (see Birkmann et al., 2022; Riguard 2018). According to Adger et al. (2021), farmers' perception of climate variability affects the manner in which they address risks and opportunities associated with climate change. In Africa, studies have shown that larger proportion of the people have poor perception and comprehension of climate change. A report by Tederera (2010) indicated that South Africans perceive or interpret climate change as a mere 'change in weather'. This has the tendency of influencing adaptation strategies. In the coastal areas of southern Ghana, adaptation mechanisms are influenced by how the people perceive climate change and variability (Codjoe et al., 2014). In their assertion, Cobbinah & Anane (2016), note that most Ghanaian smallholding farmers have a misconception of climate change and variability, and this consequently discourages positive and long lasting adaptation strategies. According to the authors, smallholder farmers ascribe climate change to anger of gods (owing to the neglect and adulteration of cultural norms and practices), the practice of witchcraft and acts of nature (Cobbinah & Anane, 2016). This could

partly explain the rationale behind the adoption of prayers by some farming communities as an adaptation strategy to deal with the adverse effects of climate change on their livelihoods (see Antwi-Agyei et al., 2021).

A number of studies conducted within sub-Saharan Africa have found instances where farmers' perceptions about changes in climate are either consistent with or differ from scientific data. For instance, a study conducted by Yaro et al. (2013), revealed that most farmers' perception about climate change was in consonance with the available data from Ghana's meteorological stations. In the northern part of Ghana, not many differences between farmers' perception of climatic occurrences and known scientific inclinations were noticed (Kusakari et al., 2014). On the contrary, Hirons et al. (2018), revealed that smallholder farmers in cocoa growing regions of Ghana have mistrust for media publication on climate change and variability. In reporting a similar incidence, Chepkoech et al. (2018), brought to light how unreliable climate data from the media space have been to smallholding farmers in Kenya. Elum et al. (2017), however, are of the view that the smallholding farmers' purview of the phenomenon is shaped by the media in South Africa. Studies have also shown that the experience of relatives and friends with climate variability and their closeness with local famers have paid off. This stems from their ability to provide useful information that greatly affect farmer's perception (Acquah et al., 2015; Cobbinah & Anane, 2016; Limantol et al., 2016). For instance, Acquah et al. (2015) reveal that farmers' understanding of climate change in the Savannah zone of Ghana comprises of increasing temperature and intermittent rainfall. According to Limantol et al. (2016), perceptions of smallholder farmers in Ghana are built around rising temperatures, a decline rainfall quantity, severity and time period, and recurrent droughts. Studies in Ethiopia (Mengistu, 2011), India (Tripathi & Mishra, 2017) and Mali (Sango et al., 2016) resonate with findings from Ghana

where farmers' perceptions about climate change emanate from increased temperature, decline in rainfall and recurrent droughts. A study conducted by Manandhar et al. (2015) indicated that about 61 percent to 86 percent of households' perceptions of climate change were consistent with scientific data in the northern part of Thailand. Simelton et al. (2013), on the other hand, indicated that the perceptions of local farmers on rainfall activities were not at par with scientific information. The authors explained that these disparities could be attributed to the incapability of farmers to remember current happenings than past weather events that occurred several years. Again, the authors mentioned that farmers accurately predicted rainfall activities only if it concurred with special occasions (Simelton et al., 2013). A similar situation is noted in Myanmar, where knowledge and awareness of farmers concerning climate change and variability were not in consonance with statistical data on rainfall and temperature patterns from weather stations (Swe et al., 2015). In the study areas, the ability of farmers to correctly predict changes in rainfall and temperature serves as a major human capital as through their indigenous knowledge, they adopt adaptation strategies that are appropriate (Bawakyillenuo et al., 2016), given the limited and delay in implementation of government development policies and intervention programmes. However, indigenous adaptation practices pose future threats to farmlands and the entire environment (Antwi-Agyei et al., 2019; Bawakyillenuo et al., 2016).

It could be deduced from the above that different entities experience and perceive climate change and variability differently across households, communities and nations. Even individuals within the same households may have varied experiences with climate change within the community. These differing experiences and perceptions are attributed to demographic (age and level of education) and other factors such as asset ownership, rainfall and temperature data accessibility and availability of agriculture extension officers (Antwi-Agyei et al., 2019; Debela et al., 2015;

Manandhar et al., 2015; Gbetibouo, 2009; Teshome, 2016; Teye et al., 2015). For instance, Debela et al. (2015) revealed that farmers in Ethiopia who had attained higher educational status were able to minimise the adverse effects of climate change and variability as they had the capacity to read, understand and apply climate data. On the contrary, findings from Teshome's (2016) study posited that age, gender and education did not greatly influence knowledge and perception of variations in climate change within families. Given that the study areas have inhabitants whose educational levels are relatively low (GSS, 2021; Teye et al., 2021), coupled with the critical role farmers academic prowess play in climate change adaptation and migration aspirations, the study seeks to gain insight into how this factor plays out in these areas through data collection and analysis.

#### **2.4 Climate Change Adaptation**

According to Kotir (2011), adaptation is an old age ideology and practice that has existed with humanity since creation. To deal with the ever increasing and spreading negative effects of climate variability and change experienced by humanity and ecosystems, diverse strategic responses have emerged from academic scholars, UNFCCC and its various arms, IGOs, non-state actors and the global community (Backstrand et al., 2017; Dellmuth et al., 2018; Persson, 2019). These strategic responses are mainly adaptation and mitigation (Aleksandrova et al., 2016; King et al., 2014; Connolly-Boutin & Smit, 2016; IPCC, 2014). A third strategic response discovered by Fuessel (2007b) is known as compensation. The IPCC (2007a) referred to mitigation as the efforts employed to limit global climate change by minimising or preventing means of emitting GHG, enhancing carbon sinks and expanding the usage of renewable energy sources. Adaptation, however, refers to the modification in natural or physical structures that deals with real or anticipated changes in climate or its impact, which aid in minimising damage

or exploiting useful avenues (IPPC, 2014). Although global responses to the effects of climate change are diverse (Dellmuth et al., 2018; IPCC, 2021; Persson, 2019), adaptation is highly considered as the appropriate strategy for rural communities (Persson, 2019). This is because previous and current levels of greenhouse gases will continue to effect climate changes in the ensuing decades (IPCC, 2018), and that due to time-lags in the climate and geophysical structure, the positive impacts of current mitigation efforts will take several decades to fully materialise (Fussel & Klein, 2006).

Adaptation has been diversely understood and construed by various people and different academic fields of study. However, the IPCC presented adaptation in a dual-cleft definition, one highlighting anthropogenic systems and the other focusing on natural structures (IPCC, 2019). Concerning the human or anthropogenic systems, the IPCC defines adaptation as “actions targeted at the vulnerable system in response to actual or expected climate stimuli with the aim of moderating harm from climate change or exploiting opportunities” (IPCC, 2019, p. 869). On the other hand, the Panel also defines the natural systems as “adjustments in ecological, social, economic systems in response to actual or expected climatic stimuli, their effects or impacts” (IPCC, 2019, p. 869). Given the negative effects of climate change on lives and livelihoods in the study areas (Derbile et al., 2022; Fielmua, 2017; Van der Geest, 2011; Teye et al., 2021), this study adopts the definition pertaining to the anthropogenic systems in order to understand and examine the impact of existing adaptation strategies employed by public, private institutions and non-state actors in shaping household vulnerability triggered by climate change.

In spite of the distinctions noted in the above definitions, it is imperative to indicate that adaptation is related to coping strategies and adaptive capacity. In defining community responses to climate and environmental impacts, coping comes before adaptation. According to Ellis (2000,

cited in Antwi-Agyei, 2021), coping emanated from the sustainable livelihood framework arm of development studies literature. Coping activities relate to temporary strategies adopted by agrarians to avert the negative impact of variations in climate (Eriksen, 2005). In their view, Kate et al. (2012), note that these measures are geared towards minimising local farmers' contact with expected or experienced climate impacts. The urgency in which these measures are adopted does not make room for ascertaining their economic or environmental sustainability. To this end, Ellis et al. (2000 cited in Antwi-Agyei, 2021), in a chronological order delineated five possible coping activities that farmers may undertake which include looking for other income generating avenues, relying on mutual commitments (for instance, seed and labour sharing), minimising household size via short-term migration, reducing the quantity of mobile capitals (for example, livestock), and selling of immovable capitals such as land. In the absence of other coping mechanisms, permanent migration is considered as an option. Pertaining to using migration as a family size reduction strategy, however, the authors failed to show that this form of migration is hinged on collective household decisions to ascertain who stays and who moves. Additionally, selling immovable capital such as land is not applicable in the study areas as the land tenure system practiced does not first support women access and acquisition of lands, and second, does not allow for the sale of farmland given its scarce nature (Songsore & Denkabe, 1995).

Adaptation to the adverse impact of climate change can emerge as both autonomous and planned. However, the IPCC (2001 cited in Antwi-Agyei, 2021), highlighted other forms such as anticipatory, private, public and reactive. Autonomous adaptation which is also known as spontaneous adaptation occurs based on individual's strategic response to climatic variations exclusive from any government involvements (Bawakyillenuo et al, 2016). It is regarded by the IPCC (2001 cited in Bawakyellinuo et al, 2016) "as a type of adaptation that does not constitute a

conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems.” Codjoe et al. (2012) also classify this form of adaptation as responsive. Planned adaptation, on the other hand, “is a deliberate policy decision on the part of a public agency, based on an awareness that conditions are about to change or have changed and that action is required to minimise losses or benefits from opportunities” (Pittock & Jones, 2000 cited in Smit and Pilifosova, 2001, p. 884). According to Smit and Pilifosova (2001 cited in Bawakyillenuo et al., 2016), this adaptation typology may be seen as anticipatory or reactive. Antwi-Agyei (2021) refers to anticipatory adaptation as a form of proactive steps taken by farmers to deal with negative impacts of climate change and its variability before its occurrence. The author, on the other hand, explains reactive adaptation as the actions that are taken to avert the adverse impact of climate variability after its occurrence. Tompkins & Eakin (2012), note strategies adopted and applied by households and individuals to address climate variability is known as private adaptation, whereas those initiatives and actions taken by the state in addressing negative climate events are referred to as public adaptation. These types of adaptation are purposely meant for addressing public needs. In spite of this distinction, Adger et al. (2005) posit that private adaptation strategies targeted at advancing farming activities of the individual could later be beneficial to the entire community, and institutional structures and laws could frustrate the fruition of some of these actions. Nonetheless, it should be clarified that these major forms of adaptation are not distinct even at the point of implementation rather can be harmonised, where planned adaptation can procedurally study from and adopt creative and various autonomous alternatives that sustain household livelihood activities in the light of climate perturbations (see Rahman, 2021).

As this study recognises migration as a strategy to deal with climate disturbances, it is insightful to ascertain how households either proactively or reactively use the phenomenon to adapt (Vinke et al., 2022). On the other hand, it is imperative to examine how governance structures, by means of planned adaptation strategies, foster households' adoption of migration as a medium to counter the impacts of climate change.

## **2.5 Migration**

Migration is a multidimensional phenomenon that has been an integral part of human existence since creation (Awumbila et al., 2016; Teye et al., 2017). Globally, migration continues to shape development through its influence on economic, social, cultural and environmental dimensions of people's daily lives (Blinder & McNeil, 2017). The benefits and opportunities created by migration for migrants, origin and destination areas or countries have resulted in massive influx of both internal and international migrants at various destinations. According to UN-DESA (2019), the number of international migrants increased from 221 million in 2010 to 272 million in 2019, a rise of about 23 per cent in 9 years. Presently, international migration stock is 281 million constituting 3.6 per cent of the global population, compared to 2.8 per cent in the year 2000 (UN DESA, 2022). In addition, the share of international migrants living in the South increased from 39 per cent in 2005 to 44 per cent in 2019 (UN DESA, 2019). Within the South, most of the growth has taken place in high-income and upper-middle-income countries, which now host 70 percent of all migrants living in the South. This data challenge the long held assertion that international migration flows have majorly manifested as north-south (ILO; 2020; IOM, 2020). Notwithstanding, internal migrants, according to Awumbila (2014), account for a much greater share of human population movement. Though data on global internal migrant

stock is scarcely available, in 2009, the UNDP revealed that there were estimated 740 million internal migrants globally (UNDP, 2009).

The complex and the multifaceted nature of the phenomenon has resulted in diverse perceptions and definitions put forward by various authors, scholars and institutions. The UN Demographic Dictionary defines migration as “a form of spatial mobility between one geographical unit and another involving a permanent/semi-permanent change of residence from a place of origin or place of departure to the place of destination or place of arrival”. Similarly, Hauser & Duncan (1973), define migration as “movement of a person or group of persons from one geographical unit to another across an administrative or political border, with the intention of settling indefinitely or temporarily in a place other than their place of origin”. On the same tangent, Goldscheider (1971) considers migration as the “detachment from the organisation of activities at one place and the movement of the total round of activities to another” (p. 64). According to the National Geographic Society (2005), human migration is the movement of people from one place in the world to another for taking up permanent or semi-permanent residence, usually across a political boundary. Moreover, the IOM (2019) has defined migration “as the movement of a person or group of persons, either across an international border, or within a State (p. 137). The Organisation further posited that migration “is a population movement, encompassing any kind of movement of people, whatever its length, composition and causes; it includes economic migration of refugees, displaced persons, economic migrants, and a person moving for other purposes, including family reunification” (IOM, 2011, p. 62). These definitions though enlightening, emphasise only the movement of people between origin and destination, but fail to advance reasons or causes of the movements. This study, however, draws on the definition given by Hauser and Duncan (1973), to investigate the significant role climate and environmental

factors and governance play in shaping mobility practices of affected households in the Upper West Region.

Migration in Africa is an old age phenomenon which has been greatly influenced by activities such as search for place of dwelling, trade, colonialism and its effects, conflict and pastoralism (Arthur, 1997 cited in Abutima, 2019). Although other forms of migration are practiced on the continent, the dominant ones are economic or voluntary migration and forced or involuntary migration both within and across national borders. Whilst forced migration on the continent may result from a multiplicity of political, social, cultural and environmental factors (Verme et al., 2020), voluntary migration is mostly triggered by the existence of better economic and social opportunities elsewhere including employment, trade, higher education, marriage and family reunification (Adepoju, 2010; Awumbila, 2014; Lee, 1966; Teye et al., 2019). Notably, armed conflicts and wars that stem from but not limited to religion and politics, violation of human rights and climate and environmental changes are responsible for involuntary migration in Africa (Burrows & Kinney, 2016). The economic or voluntary migration accounts for the production of labour migrants that dominate the migratory stream in Africa. This assertion has been buttressed by Teye et al. (2019), Awumbila et al. (2016) and Arthur (1991), who posited that labour migrants have dominated labour markets in several countries in Africa. Nonetheless, these authors were silent on the fact that involuntary or forced migrants can transform into economic migrants that may also well up the labour market. King (2002, p. 90-91; 2012, p.136-138) referred to this phenomenon as “migration binaries, dichotomies, or dyads”. These binaries, according to the author, is the process of deconstructing or fuzzing the dichotomies or dualities that exist between migration typologies.

The continent has several migration routes that connect its origin, destination and transit. The phrase ‘migrants routes’ refer to the geographical conduits taken by migrants to their destinations. As revealed by Mudungwe (2016) and Regional Mixed Migration Secretariat (2013 and 2014), the continent has three major migration routes, namely the Northern Route which passes through Sudan, Libya, and Egypt into Europe. The second route is the Eastern Route, popularly called the Gulf of Aden migration route, extends from Djibouti, Northern Somalia, Yemen to Saudi Arabia and other Middle Eastern countries. Lastly, the Southern Route also passes through Kenya, Tanzania, Mozambique, Zambia, Zimbabwe, and Malawi and finally to South Africa.

Africa experiences two major migration streams, that is, intra-regional and inter-continental. The IOM’s Global Migration Data Analysis Centre (GMDAC) shows that, over 80% of Africans have no interest in leaving the region, nor permanently migrating to other continents (IOM, 2018). The intra-regional migration involves movement within Africa, which starts from West Africa to Southern Africa, from East/Horn of Africa to Southern Africa. A greater proportion of these migrants are likely to emanate from West Africa, East Africa and Southern Africa, who purposely move in search of work. The inter-continental migration stream on the other, accounts for a small percentage of the total migration flows towards northern Europe, the United States of America, and Canada. This, however, changes the chronicle that African migrants only move to the developed countries. To affirm this assertion, the African Migration Report, which was published by the IOM and AUC (2020), notes that the magnitude of migrants who migrated between African countries grew exponentially from 13.3 million in 2008 to 25.4 million in 2017. In challenging the narrative of African migration, the IOM and AUC, argue that majority of African migrants do not travel across the oceans to Europe, but rather cross-land borders within

the continent. Even though the narrative purports that migration across the oceans is irregular, meanwhile, available data shows that a greater proportion of migration (94 %) across the oceans is done in regular manner. Also, African migrants constitute only 14% of the international migrant stock, as compared with, for instance, other continents such as Asia (41%) and (24%) from Europe (IOM and AUC, 2020).

## **2.6 Migration in Ghana**

Like other countries, migration in Ghana can be traced to historical antecedents (Awumbila, 2014; Teye, 2019). Migration has continuously played a pivotal role in the livelihood and development strategies of many in Ghana. The dynamics of the phenomenon has been perceived as complex, especially given the fact that Ghana is considered as migrant origin, destination and transit country (IOM, 2020). Internal and International migration have been the two dominant migration typologies in the country, and these even date back to the pre-colonial, colonial and post-colonial eras (Kwankye et al., 2009). Whereas internal migration may appear in the light of rural-urban, urban-rural, rural-rural and urban-urban, international migration constitutes emigration and immigration (GSS, 2016). Several other forms of migration typologies in Ghana which could be catalogued under internal and international are seasonal migration, labour migration, human trafficking, smuggling, student mobility, internal displacement, climate and environment-related migration, retirement migration, marriage migration, and family reunification migration (Awumbila et al., 2016; GSS, 2021; Teye et al., 2019). Given the focus of this study, much attention is focused on migration within Ghana. The geopolitical divide that characterises global migration flows as north-south is much evident in Ghana, where human mobility over the years has always been from the north to the southern part of the country. However, current migration trends and patterns show that work, education, retirement, marriage

and family ties drive people from the southern and middle belts to the northern part of the country. Though rural-rural migration has long been in existence (Goody, 1967; Jarawura and Smit, 2015; Lentz, 2006), emerging studies are showing re-emergence of this trend due to increased illegal mining activities (galamsey) in some rural areas in Ghana especially in the north (Teye et al., 2021).

Ghana's north-south geographical divide has been characterised by unequal spatial natural resource distribution, with the south considered as being resource wealthier sector than the north (Bening, 2005). This inequality in spatial resource distribution greatly accounts for the age long north-south migration trend in Ghana (Kwankye et al., 2009; World Bank, 2006). The northern part of Ghana, which currently comprises of five regions (Northern, North East, Savannah, Upper East and Upper West) has continuously suffered from natural resource deficiency, high poverty levels and less livelihood opportunities in relation to greater part of the southern sector. The main livelihood activity practiced by most people (more than 80%) and at seasonal level in the northern divide is subsistence farming (Bawa, 2019). This part of the country, however, has incessantly experienced climate and environmental hazards such as drought, excessive heat, poor soil fertility, water stress, land degradation and single rainy season that have affected economic activities particularly farming (Antwi-Agyei & Nyantekyi-Frimpong, 2021; Derbile et al., 2022; Teye et al, 2019). Contrary to the southern divide, which comparatively has witnessed more development, the northern sector is less developed with perceived high poverty incidence. The underdevelopment coupled with severe climatic conditions of the northern part have served as push factors that drive mostly the youth to the southern sector of the country (Abdul-Korah, 2007; Kuuire et al., 2013; Luginaah et al., 2009).

Historical accounts revealed that, the colonisation of the gold coast by the European merchants resulted in the introduction of policies that emphasised the recruitment of labour from the northern zone to work in the south. This amplified the north-south migration trend (Kwankye et al., 2009; Rademacher-Schulz & Mahama, 2012). The current seasonal and circular north-south migration patterns can be traced to the colonial era, where large cocoa and coffee farms as well as mines in the south attracted labour from the northern territories to the south where climate and ecological conditions were relatively favourable (Fielmua, 2017). Studies have shown that colonial leaders capitalised on this pattern of migration to intentionally draw and exploit labour, particularly unskilled labour migrants from the savannah zones to the forest areas for farming and mining (Aryeetey et al., 2009). This deliberate act resulted in an increased outmigration of the active labour force to the south, which consequently deepened the underdevelopment of the northern savannah zones of the country. A study by Van der Gees (2011) revealed that one out of every five people born in the northern Ghana lives or has lived in southern Ghana. This finding is in tandem with current data which record out-migrant population of 226, 226 in the region (GSS, 2021).

The perpetuation of this pattern of migration in Ghana is attributed to a plethora of factors. This study looks at a couple of them. Firstly, scholars have posited that there is uneven distribution of development projects between the south and the north. These projects included construction of rail and road networks in the south, building of ports, harbour and schools along the coast (Kwankye et al., 2009). The southern divide of the country is touted to have relatively seen more development than the northern sector because of over concentration of development projects in the former at the expense of the later. As a result, the socioeconomic development of the north has lagged behind, and this has degenerated to high poverty levels. Livelihood opportunities

available in the south serve as driving force that pull migrants from the north or rural areas to urban centres in the south, thereby leading to rapid urbanisation (Awumbila, 2014; Teye, 2019).

The second factor is linked to the failure of successive governments, right after independence until date, to successfully formulate and implement policies and programmes that seek to close the inequality gap between the northern part of Ghana and the south (GSS, 2014). According to Songsore (2009), these developmental biases have been introduced and exacerbated by some post-colonial policies on development. Awedoba (2008) has noted that the reaction of people from the north to the uneven distribution of resources, limited services and opportunities, violence, natural disaster and the impacts of extreme weather events has occasioned perpetual rise in internal migration particularly rural-urban migration. Despite the fact that some development projects and intervention programmes such as construction of new roads and expansion of existing ones, establishment of tertiary institutions (universities, polytechnics and training colleges), SADA and planting for food and jobs, it would be useful if other sustainable programmes that could contribute to a reduction in out-migration of mostly the youth and the men to the southern sector.

Studies have shown that socio-cultural factors are one of the variables propelling north-south migration in Ghana. In this instance, young females (mostly the unskilled) migrate to the southern and middle belts to undertake menial jobs and earn an income to acquire materials such as utensils and cloths to prepare for marriage (Kwankye et al. 2009; Van der Geest, 2011). A typical example is the head porters locally called *kayayei* who are mostly found in Accra and other urban centres. A study by Fielmua (2017) revealed that migrants who want to be independent of family interference and control migrate from the north to the south where their privacy is guaranteed.

Furthermore, young people's aspiration to migrate from the north to the south is motivated and intensified by the positive transformation they notice in the lives of returned migrants. This is what de Haas calls the "good life" (de Haas, 2021). In addition, the returnees who come home with enough money and other items such as cloths, utensils and bicycles have been sources of motivation for younger people to migrate in order to acquire similar items (Kwankye et al., 2009).

Based on the above review, I deduce that historical antecedents played significant role in internal migration in Ghana. Similar to claims that, migrants from the global south dominate the north-south migration flows, which has been invalidated and proven as inaccurate by current literature, emerging discussions are controverting the dominant north-south migration flow in Ghana. For instance, due to changing rainfall and temperature patterns in the Eastern Region, resulting in vegetation cover and livelihood losses, the rural active labour force are migrating to the national capital, Accra, which is also proximate to the origin (GSS, 2021). However, a combination of failed development polices (from colonial era untill now), worsening climatic conditions which degenerate into livelihood losses, and other socioeconomic vulnerabilities still account for increased outmigration from the northern sector to diverse destinations in the country with improved climatic conditions for farming and better opportunities. This phenomenon provides a suitable case to investigate how governance (national policies and local institutions) shapes livelihood losses stemming from climate change, and outmigration in the study areas.

## **2.7 Climate-Induced Migration**

Although the relationship between environmental change and human mobility has been in existence for centuries, it became an issue of global concern only within the last three decades (Foresight, 2011; Piguët, 2013; Afifi et al., 2014). According to Kalin & Cantor (2017), the

nexus between the adverse impact of climate change and various forms of human mobility such as migration, displacement and planned relocation (Zickgraf, 2019), has increasingly gained recognition in the academic and political circles in recent times. Part of the reasons for this awakening is attributed to the huge future migration flows in relation to climate change predicted by several studies (McLeman, 2019; Rigaud et al., 2018; Wilkinson et al., 2016). Additionally, a seminal paper of Myer (2002) posited that migration in response to climate and environmental changes poses a significant challenge to development in the twenty-first century and beyond. A similar supposition was made by the IOM (Brown, 2008), Christian Aid (Baird et al., 2007) and Care International (Warner et al., 2009). These predictions, according to Boncour & Burson (2009), triggered ever-increasing academic discourses on migration, with focus on national and international security, policy frameworks and human rights. Policies formulated to address the complex climate migration challenges have focused on regional (Kampala Convention – 2009 by African Union), national (Nansen Initiative–2012 by Norway and Switzerland), and international (Global Compact for Safe, Orderly and Regular migration –2018 by United Nations) levels of climate-induced migration in recent years.

Despite the fact that migration is conceptualised as having multi-causal drivers, early writers have suggested that environmental change is the major driver of human population movement (Warner 2010; Black et al., 2011). Globally, climate change-induced migration takes diverse forms. It can be planned or unplanned, involving individuals and households or entire communities (Elliott, 2019; Lindsay, 2018). Most importantly, migration stemming from climate change are forced and voluntary (Hugo, 1996). According to Boas et al. (2019), most migration out of extreme weather events are internal, with people traveling long or short distances in search for new dwellings and livelihoods within their own countries (McLeman et al., 2016). This may

be attributed to the loss of livelihood, which weakens the capabilities of households and hence may not be able to engage in cross-border migration, given the resources involved with this type of migration. International migration does occur, where climate affected people seek to relocate to other countries (Nansen Initiative, 2015). It can be temporary, with most migrants expecting to return home when conditions permit, or it can be permanent, with most migrants unable or unwilling to return (Martin, 2010). Nomadic herders and pastoralists are classified as human migration (Laczko & Aghazarm, 2009), given the impacts of severe drought on pasture. Nonetheless, climate and environmental changes may also trigger immobility tendencies where due to livelihood losses and resource scarcity, households and individuals that need to move are constrained from moving (Black et al., 2014; Mata-Codesal, 2018).

Though empirical evidence on environmental and climate-related migration in academic literature is quite enormous (Piguet et al., 2018; Hoffmann et al., 2019), these evidences remain contentious and patchy (Hunter et al., 2015). Studies have shown that debate about the multifaceted nature of the phenomenon stems from the modalities employed in determining the estimates and causality of the number of people who will migrate (Boas et al., 2019; Hugo, 2011; Perch-Nielson et al., 2008). These contestations have resulted in the postulation of two main schools of thought namely, the maximalists and the minimalists (Brown, 2008). The maximalists who are associated with environmentalists, conceptualise the environment and climate as the principal drivers of human population movement (McLeman and Smit, 2006; Warner, 2010). Their postulation resonates with the rapid-onset environmental events (Bogardi, 2009; Warner, 2010), where migration is not only conceived as a direct response to climate disturbances, but also used as a coping and an adaptation strategies to deal with negative impacts of the phenomenon (Martin et al., 2015). This stance, however, has been heavily critiqued for ignoring

the role of economic and political factors in shaping migration decisions (Teye, 2015). Erroneously, the maximalists also assume that all forms of migration relate to environmental change in the same manner (Boas et al., 2019). The minimalists, on the contrary, claim that climate change is not a direct trigger of migration; rather the phenomenon interacts with social, economic, political, environmental, cultural factors to cause human migration (Black et al., 2011; Boano et al., 2008; Foresight, 2011; Martin, 2017; Zickgraf, 2021). This school of thought is associated with slow-onset climate processes (Kaczan/Orgill-Meyer, 2020; Rigaud et al., 2017; Warner et al., 2015).

Reflecting on the foregoing review of the literature, I perceive that the relationship between climate change and migration is not unidirectional, particularly in the context of slow-onset climate and environmental processes. Instead, climate and environmental factors act as threat amplifiers that exacerbate existing socioeconomic vulnerabilities of households, compelling them to consider migration as a livelihood diversification alternative. For instance, households located in drought-prone areas with farming as their main source of livelihood and lack access to irrigational facilities, have a higher propensity to lose livelihood during the harmattan season. The loss of agriculture livelihood may potentially result in poor crop yield, food insecurity, increased unemployment and poverty. As the affected households may exhaust all possible available strategies to adapt in-situ, outmigration becomes their alternative livelihood sources. Ribot et al. (2020) refer to the factors emanating in between climate change and migration as intervening factors. However, these awful socioeconomic situations may in turn weaken the capacities (through lack of resources) of potential migrants to move, as it may be difficult for them to meet the cost of migration. The fact that the study areas suffer slow-onset climate events offers a suitable opportunity to gain some level of insight into the phenomenon, through

assessing how these events interact with socioeconomic variables that may compel household members to find alternative livelihood in migration.

## **2.8 Migration as a Coping or an Adaptation Strategy**

Climate and environmental migration was considered a security issue, hence policy formulations were geared towards the securitisation of the phenomenon (McLeman, 2019; Wiegel et al., 2019). This position was, however, criticised with scholars pointing out the consequences of dehumanising people traumatised by climate effects via legal or military apparatus (Baldwin et al., 2014; Geddes, 2015; McLeman, 2019). Protection strategies of environmental migration saw new dimensions with policy directives emphasising migration as a possible adaptation strategy to climate change that should be governed and expedited (Piguet, 2013; Wiegel., 2019). This new cause was championed by policy doyens (Honarmand et al., 2019), international organisations (Hall, 2015) and researchers (Sakdapolrak et al., 2016). According to Felli (2013), the International Organisation for Migration (IOM), is one of the touted international bodies that introduced the concept of ‘migration as adaptation’, which has been widely applied in a number of related studies. The concept got the attention of a major climate actor such as the United Framework Convention for Climate Change, which sort to reframe migration as possible strategy for filling the climate adaptation gap (Rigaud et al., 2018). This notion is mirrored in strategic blueprints like the Cancun Adaptation Framework (Warner et al., 2015), the Sendai Framework for Disaster Risk Reduction (UNISDR, 2015) and the Global Compact for Migration (IOM; 2018; UNGA, 2018).

Literature on climate change and migration is replete with debate on migration as climate change adaptation. As part of the debate, some scholars have argued that families or households examine all existing alternatives to adapt to the adverse effects of climate change. In line with this,

families are expected to opt for the ones that can address their immediate circumstances, which may include a deliberate decision to migrate, if potential migrants have the needed resources (Black et al., 2011; McLeman, 2006; McLeman, 2016; Sakdapolrak et al., 2016). Although the concept of migration as adaptation seems to portray a positive relationship between the two variables, premium must be placed on migratory processes such as migration decision and migrant's agency (Vinke et al, 2021). Studies have shown that, irrespective of the hazards and threats posed by climate change, for some households, migration becomes a last resort within a continuum of options (Jacobson et al., 2019). This phenomenon may be attributed to varied factors including but not limited to place attachment, and strong family ties. More so, migration in this regard usually functions more as a temporary coping strategy than as adaptation. To this end, it is important to understand that the decision as to whether families will adopt migration as adaptation is contingent on several factors including the context in which migration takes place and adaptive capacities of households.

Even though migration is often viewed as climate change adaptation strategy (Gemenne and Blocher, 2017; Vinke et al., 2021), discussions on the subject range from migration as a successful form of adaptation, to migration as a failed strategy. According to Tacoli (2011b), and Warner & Afifi (2014), migration only qualifies as a 'successful' adaptation plan if it improves people's ability to depend on available household resources. This could be linked to migrant remittances which enable farmers and individual households to acquire basic farming inputs such as fertilisers, improved seeds, agrochemical and hiring the services of farm labours (Banerjee et al., 2017; Musah-Surugu et al., 2018; Szaboova, 2023). More so, Blocher et al. (2017) stipulate that the success of migration for households' income generation avenue is largely influenced by the family's circumstances before migration. In this instance, adaptive capacity of migration is

seen in the light of income generation, livelihood diversification, sharing households' risks and financial or social remittances (Musa-Surugu et al., 2018; Ober & Sakdapolrak, 2016; Stark, 1991). Similarly, in spite of the fact that migrants are often characterised as victims of climate change, studies have shown that in the midst of the climate and environmental risks, migration becomes a viable family strategy employed to bolster livelihoods (Foresight, 2011; Vinke et al., 2021). Several scholars are of the view that for people who may not stay close to homes, migration becomes the best option in terms of adaptation strategies (Adger et al., 2018; McLeman, 2016; Vinke et al., 2021). The point of clarity is that, some individuals are more migratory in nature, hence, given the impacts of climate change on household livelihoods at the origin, it becomes preferable for such people to move further to destinations that offer them better livelihoods opportunities that would enhance their ability to support relatives back home through remittances.

In the sub-Saharan Africa, a number of examples depicting how and the extent to which migration is adopted as adaptation have been documented. According to Morrissey (2014), empirical studies in the sub region analysing mobility stemming from different climate and environmental impacts, professed migration as a multidimensional strategy that addresses the shifting socioeconomics, demographic and ancient perspectives, which also has transitory and permanent effects. Migration has been identified as one strategy among many employed by rural dwellers in the sub-Saharan Africa to deal with perennial aridity (McLeman & Smit, 2006). This is for instance, evident in a situation where farming communities from the Sahel regions in Africa have sent a number of family members to well-endowed coastal zone as a way of coping with drought (Teye et al., 2022). This is done in anticipation that these migrants will remit left-behind relatives back home for consumption and development purposes (Mensah-Bonsu, 2003;

Musah-Surugu et al., 2018). Additionally, these remittances create resource pool that can be used to absorb uncertainties and shocks such as climate change impacts and general environmental perturbations (Stark & Bloom, 1985; Taylor, 1999; Musah-Surugu et al., 2018). According to Call & Gray (2020), climate abnormality such as heat stress was the major trigger of climate and environmental migration in Uganda. According to the authors, short-term migration amplified in response to excessive heat, and became a livelihood modification strategy. Call & Gray (2020) further stated that the same phenomenon of heat stress also resulted in permanent migration in Uganda. However, according to Hisali et al. (2011), the decision to migrate with respect to climate change adaptation in Uganda is determined by a number of factors including age of family head, admittance to economic prospects consisting of loan facilities, admittance to extension services and safety of land occupancy. Moreover, in Ethiopia, households located in arid areas adopted migration in times of drought after trying other strategies including the sale of assets and minimising the consumption of food (Meze-Hausken, 2000). In the rural part of northwest Nigeria, a combination of torrential, wrongly predicted rainfall and excessive drought perpetuated food shortages and mass migration from the Sahel to the Savanna, which was noted as food hub for communities experiencing food scarcity (Grolle, 2015). In Ghana, it was discovered that out-migration in response to low crop yields dwindled (Van der Geest, 2011). A study by Bawakyillenuo et al. (2016) found that in addressing the impact of variations in rainfall and temperature in the savannah zones of Ghana, migration has been employed as one of the strategies.

A number of evidences have been advanced to affirm migration as a successful adaptation to climate change. Grolle (2015) disclosed that in the Sahel region of Nigeria, many were able to safeguard their rights to farmlands due to outmigration of other household members to the

Savanna zones. Studies in Niger posit that indigenous adaptation and economic migration have become less effective, thereby resulting in severe periodic cases of famines as people no longer derive utility from basic foods (Oliver de Sardan, 2007). According to Grolle (2015), migrant remittances became more significant in the lives of the dwellers of the Sahel areas. De Haas (2007 cited in Gemmene & Blocher, 2017), indicates that migrants remittances can help in building resilience of families left behind in agriculture, and also play key role in the modification of rural economies (Barnett & Webber, 2010). A study by Musah-Surugu et al. (2018) showed that remittances serve as a means of financing climate change adaptation in Ghana.

In spite of the above evidences, other scholars have also argued that migration in response to climate change will not only augment vulnerabilities but also weaken the capacities of households to adapt in-situ. According to Vinke et al. (2022), it is possible for migration to result in the loss of livelihoods and further exacerbate vulnerabilities of the migrating individuals and their household members, irrespective of how well it is planned over time. The literature recognises this type of unsuccessful migration as attrition or maladaptation (Warner & Afifi, 2014). In several parts of South East Asia, scholarships show that despite increased outmigration, there is no significant advancement in the level of households' affluence (Jacobson et al., 2019). However, studies have also indicated in Africa that migrant households are richer compared with those of non-migrants households (Adepoju, 2008; Awumbila, 2014; Teye, 2017). Aside from the tangible impacts of migration on households, there are other unnoticed adverse effects of the phenomenon on household members such as emotional wellness and mental soundness. Again, climate change has the potentials to trigger the much touted 'non-economic losses' which include loss of customary means of living and traditional legacies, language, social networks,

individuality and community solidity (Campbell, 2014). This assertion is confirmed by a number of scholars who contended that, “migration is not ‘successful’ adaptation if it ‘results in damage to people’s traditions, knowledge, social orders, identities, and material cultures” (Adger & Barnett, 2005; Adger et al., 2011). Given the impact of migration in terms of cost on the migrants, origin and destination, policies could be geared towards making migration unattractive so as to entice people to stay.

From the review above, I gathered that the framing of migration as a coping and an adaptation strategy emphasises individual or family responsibility rather than the entire community. This motivate me to seek clarification on who actually is or should be responsible for adaptation. As Vinke et al. (2022) contended, the choice of migration as climate adaptation seals a governance gap. This may stem from the fact that governments may hide behind the loose theorisation of migration as adaptation and shirk their responsibility to households and communities affected by the adverse impacts of climate change (Vinke et al., 2022). This phenomenon has contributed to the worsening vulnerability inclinations of individual households and communities that experience massive human migration in response to climate exasperation, as migration produces negative socioeconomic, cultural, political and security tendencies. Nonetheless, communities that do not have access to government intervention or aid from the international community, remittances play a significant role in their adaptation to climate change. It then becomes crucial to examine how local and national level governance role affects household in communities where migration is employed as an adaptation strategy.

## **2.9 Governance of Climate change-induced Migration**

To understand the concept of climate migration governance better, it is expedient to first look at what global governance entails. As put forward by Weiss and Wilkinson (2014, p. 208 cited in

Persson, 2019), global governance refers to “the collective efforts to identify, understand, or address worldwide problems and processes that went beyond the capacities of individual states”. Similarly, global governance has been defined “as the system of laws, rules (formal and informal), policies and organisational setups which develops to manage common affairs, in this case climate change-induced migration” (Nash, 2018). Many of these laws, rules, policies and organisational setups will develop at the international level, but interaction with regional, national and local levels of governance will also take place and a variety of stakeholders ranging from international organisations to states to non-governmental organisations (NGOs) and local grassroots movements will be involved (Lederer, 2015). Although there is no generally accepted definition of governance of climate change-induced migration (Nash, 2017; Teye et al., 2021; Zickgraf et al., 2021), this study adopts the definition given by Martin (2010). According to the author, governance of climate change-induced migration constitutes legal frameworks and institutional roles and responsibilities to manage migration in response to climate change. Following this, governance of climate change-induced migration in this study unpacks the various national policies and local institutions that shape the phenomenon. Scholars are of the view that policies and institutions facilitate human migration when necessary, and compel people to stay when situations demand (Nash, 2017; Warner, 2010; Wilkinson et al., 2016). In her assertion, Zickgraf (2018), indicates that these policy interventions aimed at fostering movement can also promote immobility. For instance, according to Bierman & Boas (2012), global governance of climate-induced migration must build policy intervention around recognition, protection and resettlement of climate migrants.

It has, however, been established that there is an intricate relationship between climate change, migration and governance (Boas et al., 2019; Nash, 2017). The complexity that characterises

climate-induced migration due to its intricate socio-ecological interactions manifests in its mirrors its governance perspective (McAdams, 2011). Literature reveals several reasons advanced in this direction. Primarily, one major underlying factor that informs the difficulty in defining specific governance context of the phenomenon alludes to the challenge of mapping out causality between climate change and migration (Martins, 2010; McLeman, 2019). According to Ribot et al. (2020), this phenomenon is attributed to the several intervening factors between climate change and migration, hence, augmenting the inability of scholars to prove its mono-causal link. Nonetheless, even though there could be projections and early warnings that show the possibility of the occurrence of climate-induced migration, dealing with the phenomenon is inhibited by the paucity of policy and institutional actions fit for these typologies of migration (Martin, 2017; Riguard et al., 2018). Again, mixed migration flows present another challenge in climate migration governance (Warner et al., 2015). In this regard, it is difficult to single out a particular policy to govern climate change-induced migration as the phenomenon emanates from diverse policy areas, with all exhibiting the legitimacy to govern (McAdams, 2011). Aside from these, migration either forced or voluntary, is seen as embedded in other issue areas (Betts, 2011), and for this matter, lacks the specific policies and institutions that define its governance context (McLeman, 2019). Notwithstanding the above, other scholars have maintained that since climate change is conceived as a threat amplifier (Birkmann et al., 2022; Codjoe & Atiglo, 2020; Ribot et al., 2020; Zickgraf, 2021), governance could focus on this context or on the intervening factors which are exacerbated by climate change and subsequently fueling migration decisions (see Ellis, 2000; Hoffmann et al., 2022; Schewel, 2020; Thiede & Gray, 2017). However, this is dependent on the governance context, as governance efforts could be geared towards fostering in-situ adaptation or ex-situ adaptation (outmigration).

In Ghana, while policies have been formulated to govern other types and aspects of migration such as emigration, immigration, return migration, refugee, and diaspora (Kandilige et al., 2022), none can be mentioned of climate-induced migration. For instance, immigration is primarily regulated by the Immigration Act of 2000 (Republic of Ghana, 2000a) and emigration is governed by the ECOWAS Protocol (ECOWAS Protocol, 1979), and National Labour Policy (MELR, 2020). However, as climate-induced migration is considered a development related issue, the phenomenon is deemed to have been governed by development and agriculture related policies (Kandilige et al., 2022). In the northern sector, for instance, where the impacts of climate change on agrarian livelihood are devastating because of its climate-sensitive nature (Aniah et al., 2016; Antwi-Agyei et al., 2021; Baffour et al., 2022; Fielmua, 2017; Tanle & Kyereme, 2014; Teye et al., 2021; Van der Geest, 2011), thereby compelling the active labour force to engage in both seasonal and permanent migration (Fielmua, 2017; Jarawura and Smit, 2015; Kuuire et al., 2013; Luginaah et al., 2009; Tanle & Kyereme, 2014; Teye et al., 2021), governance (policies and institutions) is inclined towards shaping livelihood and adaptation conundrums than outmigration. As climate change, livelihood losses and outmigration have been age long experiences for individual households and communities in this part of the country (Awuse & Tandoh, 2016; Van der Geest, 2011; Tanle, 2010); policies and development initiatives that shape these phenomena equally date back even to colonial times (Bening, 2005). Recent policies implemented have exhibited similar tendencies of explicitly shaping livelihoods and in-situ adaptation with little to no impacts on migration inclinations. For instance, the 1V1D policy initiative was implemented to ensure all-year-round agriculture activities, aid in-situ adaptation and reduce poverty in the north (MoFA, 2021; Owusu et al., 2021). Likewise, the SADA policy was implemented as a strategy to diversify rain-fed agriculture livelihoods, reduce

poverty and close the development lacuna between the north and the south (Cao, 2017; SADA, 2016). Additionally, the one-district-one-factory is a development initiative rolled out as an avenue to create job for the teeming active labour force in rural and proximate urban communities with the purpose of enhancing income levels and to reduce rural-urban migration (Ofori-Atta, 2019). The FSP was equally executed with its core mandate to bring poverty to the barest minimum and expand agriculture output (MoFA, 2021; Teye & Dzifa, 2018; Nuhu & Wale, 2023; Yakubu et al., 2019). The fact that the study areas experience climate impact and outmigration, and also benefit from the implementation of a number of development policies, coupled with activities of existing local institutions, provide a suitable context to examine the possible interplays between governance, climate change and migration.

From the perspective of the above literature review, I posit that, even though the complexity that engulfs climate migration makes its governance more difficult, most policy initiatives rolled out either deliberate or unintended foster involuntary immobility of climate affected individuals and households. However, studies indicate that regions or areas that benefit from the implementation of in-situ adaptation policies and development initiatives witness high incidence of outmigration (see Boas, 2019; Ribot et al., 2020; Teye et al., 2021). This could be attributed to a plethora of factors. One of the possible contributing factors may be the inability of policy doyens to identify and deal with the actual intervening factors that compel people to migrate including their aspirations and capabilities. More so, as these development and policy initiatives yield positive results, potential migrants may build the required capabilities that foster migration, as development drives increased outmigration. To offer a more nuanced analysis of how governance structures and contexts shape migration decisions of households in response to climate change, the study adopts Giddens' Structuration theory as its theoretical perspective.

## **2.10 Theoretical Perspectives of the study**

This study employs two levels of theoretical paradigms, that is, a philosophical approach and a mid-range approach. The study applied the Structuration theory as its philosophical underpinning and the DFID Sustainable Livelihood Approach as the mid-range theory and the conceptual framework. These theories were employed as they best explain the research topic, research problem and help answer the research questions.

### **2.10.1 The Structuration Theory**

Structuration theory is a philosophical theory that emerged out of critical analysis of the humanistic ideologies or as a response to the discontent with the humanistic and structuralist approaches. Though diverse forms of the theory have been put forward, the British Sociologist, Anthony Giddens (1984) promulgated the most popular and extensively applied version. The proponents of this theory have challenged the humanistic proposition that human actions are only based on individual intentions, and failed to accept the structuralists' assertion that human actions are only conditioned by structures. On this premise, Giddens (2000), has therefore, developed the structuration theory that explains human agency or action in the context of social structure and the interplays between the two concepts. Giddens defines structuration as “the structuring of social relations across time and space, in virtue of the duality of structure” (Giddens, 1984, p. 376). He further sees structuration as the circumstances governing the perpetuity and metamorphosis of structures, and hence, the reproduction of systems (Craib, 1992, p. 33). The Sociologist further posits that human agency and structures are not two separate concepts or constructs, but these together are produced by social action and interaction (Holt-Jensen, 1999). In the views of the Sociologist, “all social actors, no matter how lowly, have some degree of penetration of the social forms which oppress them” (Giddens, 1984, p. 72). He

propounded the structuration theory, which conjectures that human actions are shaped by structures in society, but individuals are also skilled and knowledgeable agents who direct their own lives through actions best known as agency. Giddens (1984), therefore, objected to the structuralist's perspective that describes individuals as flaccid actors whose actions are exclusively determined by structures within society. Hence, structuration theory centres on examining and analysing the ways in which social systems are produced and reproduced in social interaction (Giddens, 1984, p. 25).

As a basis, Structuration theory focuses mainly on delineating the relationship between human agency and structures (social forces), and that of social institutions (Giddens, 1984). He describes structures as external forces and human agency as internal motivation or respectively, macro versus micro perception in society (Mukunda, 2012). According to Giddens (1984), human agency can be described as people's capabilities, and their related activities or behaviour, but not the agents themselves. Sibeon (2004) on the other hand, explains 'structure' as the conditions that constrain or enhance the capabilities of individuals. Giddens also believed that it was humans that act as knowledgeable beings in unification with the social order to transform social reality. According to the Sociologist, structures can function both as a constraining (rule) and enabling (resource) elements for human action (Holt-Jensen, 1999, p. 125). Structures could be economic, ideological, traditions, moral codes, institutions, laws, resources, infrastructure, and market systems. Individuals are born into societies that entrap them within social structures, which both constrain and also enable them. In structural Marxism, agents are ruled by structures. However, structuration theory posits that structures are created and recreated through human agency (Holt-Jensen, 1999).

The inseparable interconnections between human agency and structures are what Giddens refers to as ‘duality of structures’ (Holt-Jensen, 1999). The agents do not have a complete knowledge about the world. They interpret and transform the empirical world, but these interpretations and transformations are constrained and enabled by the structures at the real level. Individual also gradually transforms structures. Giddens calls this the duality of structures. While structures are products of the intended and unintended actions of people, they also “subsequently shape people’s action; not by strict determination but by providing flexible orientation points which may either constrain or enable what is possible” (Leach et al., 1999, p. 230).

Structuration, like any theoretical paradigms, is suggested to have two significant philosophical components; Ontology and Epistemology. Ontology is the theory that suggests the existence of some phenomenon and Epistemology emphasises the philosophical theory of knowledge, exploring a definition for a phenomenon, recognising both its sources and establishing its limits (Cloke, 1991, p. 95). Giddens is more interested in proving the existence of this duality between structure and agency than defining what exactly causes or reinforces its existence.

In spite of the relevance of Giddens structuration theory to this study, a number of criticisms have been levelled against it. Firstly, Giddens does not provide guidance on how to apply structuration theory in a research. Considering the key elements such as structures, human agency and duality of structures, the relevance of adopting the theory to explain a given phenomenon cannot be underestimated. For instance, the application of structuration in this study aids in uncovering governance structures, human agency and the interplay between them. Researchers, therefore, would be missing certain fundamental concepts once they cannot relate with the theory in a research. Secondly, feminist sociologists have also criticised Giddens for not considering the element of gender dynamics in structuration theory (Murgatroyd, 1989). It is

significant for a study focusing on climate-induced migration where women involvement in terms of small-scale farming and migration decisions are prevalent. Thirdly, one important critique of the structuration theory is the difficulty in identifying structures. This is crucial because once certain important structures are not identified to provide vital information the findings from the research may be inaccurate and unreliable. This makes it difficult to understand why people behave in certain way. Lastly, structuration theory has also been criticised for being ontological. Thus, its assumptions have only focused on existence of social phenomenon without investigating how the phenomenon came into reality.

#### **2.10.1.1 Application of Structuration theory in the study**

Despite its criticisms, the structuration theory was employed for this study. In applying this theory to the context of governance, climate change and migration, key concepts such as structures, agency, and duality of structure are drawn on. This theory was chosen as the right theory applicable to this study because it seeks to establish the relationship between various structures in society and human agency, which are dynamic in themselves (Basker, 2013). In this study, the theory is employed to identify the national level policies and local institutions herein referred to as the structures, and migration (both seasonal and permanent) and in-situ adaptation strategies as human agency. The duality of structures was also linked to the interplays or interactions between the national policies and local institutions and outmigration and in-situ adaptation. It should be noted that, even though the theory draws attention to economic, social, political, environmental and cultural structures, these are embedded in the policies and institutions examined in the study.

The national level policies in this context include Savanna Accelerated Development Authority, One-district-one factory, National Policy on Dams (One-village-one-dam), and National

Fertiliser Subsidy Programmes. Furthermore, a number of formal, informal, private and civic local intuitions such as district agriculture extension officers, family systems, traditional land tenure systems, NGOs, farmers association, financial institutions are conceptualised as the structures in the theory. According to Teye et al. (2021), the interaction between these policies and institutions in shaping livelihoods and climate change adaptation is key in determining migration decisions of climate-affected households.

Human agency in this context may involve a number of activities undertaken to minimise the impacts of climate change by those adversely affected. These actions and capabilities may include liaising with available migrants' networks and hometown associations, adopting both internal and international seasonal migration as alternative livelihood diversification strategy, forming farmers associations, joining farmer related NGOs, organising micro credit (locally referred to as Susu). In-situ adaptation strategies such as improvised irrigation systems, planting date adjustment (early planting), crop diversification, increasing the intensity of input use, using improved seed species/hybrids and insecticides, applying fertiliser, integrating crops with livestock, tree planting, soil and water conservation and management systems. The success or failure of these activities is by far contingent on the role of the policies and institutions identified earlier. This explains the relevance of the duality of structures.

Another key concept in the Structuration theory adopted in this study is the duality of structures. This concept, as already discussed, seeks to establish that there is a mutual dependence between structures and agency. Giddens posits that 'the structural properties of social system are both the medium and the outcome of the practices that constitute those systems' (Giddens, 1991). Again, the sociologist views human agency and social structure as not separate concepts but as a two-

way approach of considering social action. Instances reflecting these interplays are discussed in the ensuing paragraphs.

Firstly, households and individuals attempt to use migration as a coping or an adaptation strategy may be stifled by harsh economic policies, which make it difficult for potential migrants to meet the cost of their migration. For instance, the SAPs led to increased poverty in the northern regions accounting for involuntary immobility of some people, however, those with the financial capacity were able to move. Additionally, individuals may rely on their migrant networks at the destinations for financial assistance or may even borrow money to facilitate their migration (Massey et al. 1998, p. 21). Similarly, constraining structures in this study could be related to a scenario where pastoralists or livestock farmers in the study areas may find it cumbersome to locate grazing lands or pastures and water for their livestock during the dry season. To deal with this structural albatross, pastoralists may deploy their agency such as embarking on rural- rural migration and rural to peri-urban migration in search of grazing lands for the livestock.

Secondly, Sibeon (2004) posits that structures act as either constraining forces or an enhancement to capabilities of the individuals. For instance, although the dry season caused by long period of drought deters farmers from farming (eventually leading to loss of livelihood), some local farmers are able to overcome this structural constraint by improvising certain irrigation facilities that enable them to farm during this season. In the absence of irrigational facilities, farmers may undertake seasonal migration to destinations in search of menial jobs, which provide them with alternative income sources. However, this is dependent on the aspirations and capabilities of these individuals (de Haas, 2021). The theory again, elucidates that, within a given population, when the majority of people change their behaviour, then the norm in question is changed because social norms are structures and are dynamic. This element

of the theory can be identified for example, when most farmers decide to do early planting because of the changes in the climatic patterns. If the practice works for them and they continue with it for a long time, then it becomes an accepted adaptation strategy. This means the old norm of planting late around a certain known period has changed to a new and more suitable time for the farmers.

According to Giddens (1984), there is an inseparable relationship between agency and human action as to be human is to be an agent although not all agents are human. It is a known fact that human beings do not always succumb to authority and rules created by structures but in the confines of agency they freely act. He further explains that human actions cannot always be foreseen because of the custody of agency. In his views, human beings do not always abide by normative ways of behaviour, as it is inevitable for them to break some of these norms. In this perspective, public and private financial institutions could establish micro credit schemes to assist local farmers whose source of livelihood has been hampered by the impacts of climate change. Since human actions cannot always be predicted, there is the possibility that these farmers could default credit payment due to crop failure for instance. Similarly, some financial institutions make it difficult for local farmers to access credit facilities as they demand collateral security, which most of them (especially women) cannot provide due to high level of poverty shaped by adverse effects of climate change on livelihood. Smallholder farmers on the other hand, are able to organise their own local micro credit popularly called 'susu', out of which they mobilise funds to support their livelihoods. There could also be rare cases where some local farmers may meet the demands of the financial institutions by using their landed properties as collateral security for the credit facilities.

More so, in the Upper West region, family heads who are regarded as the custodians of the land, introduce land tenure systems where the ownership and control of land favour men than women. This system limits access to and supply of land to women smallholder farmers (Yaro, 2013). A situation that adversely affects their source of livelihood (Abakisi, 2018; Anaglo et al., 2014). However, female farmers are able to use their association with farmer related NGOs, traditional women leaders (Magajias), religious authority, as their agency, to influence some of these norms and systems that tend to disadvantage the women. Additionally, farmers with limited access to land supply are able to ensure its maximum utilisation by using improved seed species/hybrids and application of fertilisers which together lead to increased crop yield.

Another dimension of Giddens theory that throws more light on the duality of structures is the relationship between agents and institutions. He elucidates that the agents in addition to the people in the institutions and all actors need to work using the structures such as policies, rules, resources, infrastructure etc. in a two-way manner by undertaking decisions and actions that define their livelihood outcomes, whether secure or not (Giddens, 1984). For instance, farmer organizations like the Agricultural Extension Service, the Forestry Commission and farmer related NGO cannot work in isolation but would have to work with individual farmers, farmer groups and other groups in extending the appropriate farming practices and support services needed. It also looks at smallholder farmers' capabilities and abilities to undertake their activities and adapt effectively to even larger scale problems in the face of climate change vulnerabilities. Thus, individual farmers can work closely with state institutions and emerge as part of societal growth, but also be skilled agents who direct their own lives through appropriate actions (agency).

Given that this study has livelihood challenges in the context of climate change as one of its foci, which is not explicitly spelt out in Giddens' theory of structuration, the Sustainable Livelihood Framework is adopted. The tenets of this framework are discussed in the next sub-sections.

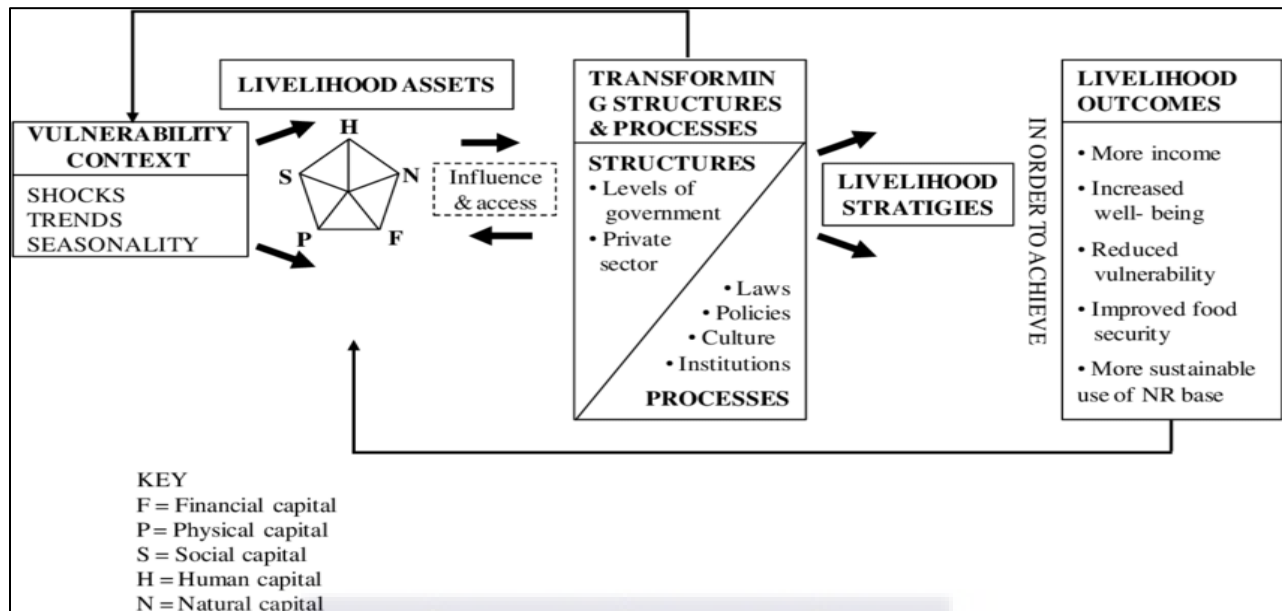
### **2.10.2 The Sustainable Livelihood Framework**

According to Chambers & Conway (1992), livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. They posit that a livelihood is sustainable when it can cope with and recover from stress and shocks, maintains or enhances its capabilities and assets, and provides sustainable livelihood opportunities for future generation and which contributes net benefits to other livelihoods at the local and global levels and in the long and short term (Chambers & Conway, 1992). Though there are several livelihood approaches, for the purpose of this study and for the fact that it is the most widely used tool to understand and act upon the various components of livelihood, the United Kingdom's Department for International Development (DFID) is adopted and analysed in this study.

#### **2.10.2.1 The DFID Livelihood Approach**

Carney et al. (1999) posit that the DFID approach and framework conceptualises how people, particularly the rural poor operate within a vulnerability context that is shaped by factors including shocks, shifting seasonal constraints and opportunities, economic shocks and long-term trends. In addition, the framework explores how people appropriate the five different types of livelihood assets or capital (example, natural, social, physical, human and financial) in diverse ways, which are influenced by vulnerability context, a number of institutions and processes; and how they use their asset base to develop a range of livelihood strategies to achieve desired livelihood outcomes. This is presented in figure 1.1 below.

**Figure 2.1: DFID Sustainable Livelihood Framework**



**Source: (Carney et al., 1999)**

According to Moser (1996), vulnerability is the insecurity of wellbeing of a person or society in the phase of changing environments such as technological, ecological, political, economic and social in the form of sudden shocks, trends, and seasonality. Contextually, rain-fed agriculture, which happens to be the main source of livelihood in the Upper West region has been hampered by climate and extreme weather events thereby creating vulnerability. The vulnerability context may consists of trends such as available resources, smallholding farmers, local and national economy, governance systems, in-situ adaptation and migration. These elements are not static as they keep changing and affecting all aspects of human life. Shocks on the other hand, are the unforeseen occurrences that afflict lives and livelihoods (Carney et al., 1999). In this study, shocks could take a natural form such as floods, earthquakes and drought; economic dimension such as negative macro and micro economic policies, financial crisis and unemployment; political shocks such as strict government policies and unstable governance systems; there could also be security shocks including conflict and tribal wars. In the agriculture sector, shocks could

comprise of crops and livestock health. Seasonality explains the times and seasons of the year when economic activities are viable. Additionally, seasonality can also focus on fluctuations of commodity prices, seasonal and permanent migration.

According to the DFID SLF, to achieve positive livelihood outcomes, a combination of assets is needed, as no single category of assets on its own is enough to yield all the many and varied livelihood outcomes that people seek (Carney et al., 1999; DFID, 2005). In that regard, livelihood assets provide a vast range of resources specifically physical, human, social, natural, political and financial capital, which can be drawn on (Cahn, 2002). Although individuals who appropriate these resources to their advantage may not be privileged to own them, they may have the ability to exercise substantial control over these assets (DFID, 2005; Small, 2007). In the study areas, individuals may possess human capital which comprises of abilities, experience, work skills and the physical state of good health, the combination of which could grant them the opportunity to utilise diverse strategies to realise their livelihood aspirations. Social capital on the other hand, refers to social resources the population could lean on when seeking their objectives (Carney et al., 1999). In this context, social capital may encompass social networks, seasonal or permanent outmigration, local authorities, and local associations (including farmers associations, market women etc.). Other important assets available especially to farmers are land, air, water, sunlight and genetic resources, which can be used as inputs to create additional benefits, such as food chains, protection against soil erosion, and other natural resources which can support livelihoods (DFID, 2005). More so, for individuals to achieve their livelihood objectives, they could draw on financial resources which may include the availability of cash or equivalent that enables people to adopt different livelihood strategies. It is imperative to find out the type of financial service organisations that exist, be it formal or informal, the kind of service

they render and under what conditions (that is interest rate, collateral requirements etc.). As part of their financial assets, some households could be depending on remittances from family members and friends. Finally, households may rely on physical capital or assets to realise their livelihood aspirations. This type of capital, in the study areas, could comprise of basic infrastructure and producer goods needed to support livelihoods. Infrastructure in this sense constitutes changes to the physical environment that enable the people to meet their fundamental needs and to be more productive. Producer goods on the other hand, are the tools and equipment that people use to function more effectively (DFID, 2005). To ensure sustainable livelihoods, infrastructure such as good roads and affordable transport, irrigation, secure shelter and buildings, adequate water supply and sanitation, markets and clean and affordable energy are indispensable.

Though important, livelihood assets on their own cannot deliver the desired livelihood outcomes without the legitimate transforming structures and processes. The place of transforming structures and processes in the framework is crucial as they can determine negative or positive livelihood outcomes (Carney et al., 1999). According to the DFID framework, transforming structures and processes are the institutions, organisations, policies and legislations that shape livelihoods. They operate at all levels, from the household to the international arena, and in all spheres, from the most private to the most public.

In realising livelihood outcomes, individuals undertake a number of planned activities. These activities, combined advantages, opportunities and choices that are opened to the individuals are referred to as livelihood strategies (Carney et al., 1999; DFID, 2005; Farrington et al., 2002). Livelihood strategies are direct dependent on asset status and policies, institutions and processes. Livelihood strategies that could be undertaken in the study areas to avert or minimise the

vulnerability created by climate and weather events may include all possible in-situ adaptation strategies and seasonal or permanent outmigration.

The final component of the DFID Sustainable Livelihood framework is livelihood outcomes. These are the achievements or products of Livelihood Strategies, which comprise of more income, increased well-being, improved food security, reduced vulnerability, resilience and more sustainable use of natural resource base (Carney et al., 1999; DFID, 2005).

Similar to all other theories, the DFID Sustainable Livelihood Framework has its strengths and weaknesses. One major strength of this approach is reflected in its all-encompassing perspectives of diverse strategies, which are employed by people to sustain their livelihoods. Getting to comprehend the process by which people cope with shocks and stresses can foster the comprehension of the usefulness of migration in this perspective. More so, the framework is hailed for providing explicit and ideal strategic ways of poverty reduction and has established a better way of combining the four indicators of development such as economic, social, institutional and environmental (Kollmair, 2002). These strategic approaches if well harnessed and applied will help minimise the impacts of climate change and consequently reducing outmigration in the northern part of Ghana.

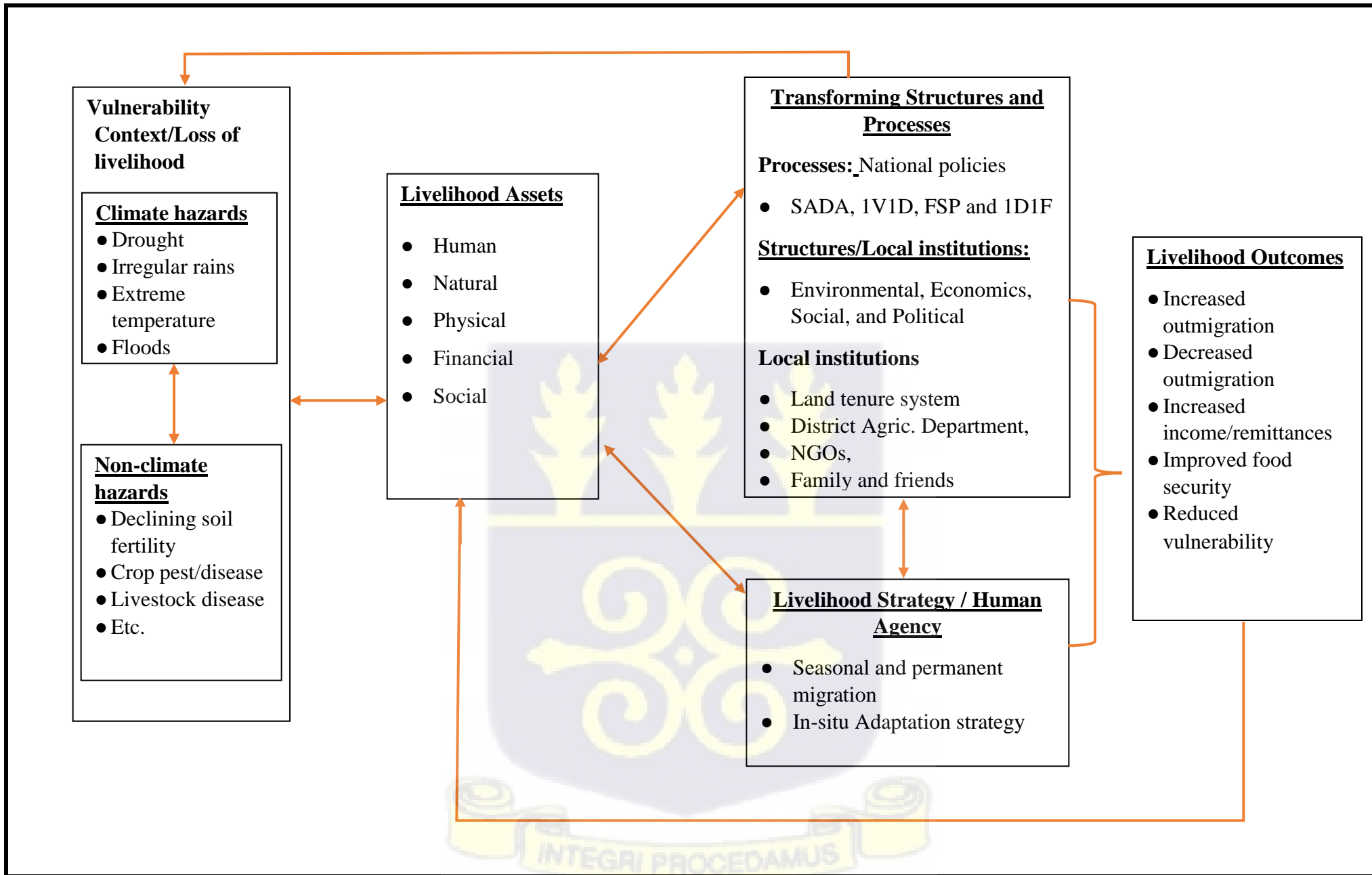
In spite of the aforementioned strengths, the framework has a number of weaknesses. Firstly, it is no doubt that analysing differentiated livelihoods requires time, financial and human resources, a condition which development initiative may not meet (Cannon et al., 2003). This explains the reason behind the inability of project funders and policy implementers to identify a specific project that provides livelihood needs of climate affected communities to reduce outmigration. Secondly, the holistic nature of the framework implies that one has a plethora of information to cope with. This makes the application of this approach cumbersome and eventually ineffective.

Moreover, as the livelihood of a particular group is enhanced, adverse impacts may ensue on other livelihoods of different entities. This may result in dilemma as to which sector or group to prioritise. For instance, addressing climate adaptation needs of only women or aged in a community excluding the youth may lead to increased youth migration. Lastly, the approach ignores inequalities concerning power relations at the community and households levels. It assumes that families are conflict-free and hence build consensus through decision-making (Waddington, 2003).

### **2.10.3 Conceptual Framework for the study**

The literature review, has so far, shown that climate change negatively affects livelihoods of agrarian households particularly in the arid and semi-arid regions of sub-Saharan Africa (Antwi-Agyei et al., 2021; Feitelson & Tubi, 2017; Teye & Owusu, 2015). Rural households have adopted several strategies including migration to deal with the livelihood challenges emanating from climate activities (Afifi et al., 2014). As migration in response to climate perturbation intensifies (Feitelson & Tubi, 2017), efforts have and are still being made for its governance. However, given the implicit relationship between climate change and migration, there has not been a single policy and institutional frameworks that explicitly shape migration in this context (Riguad, 2018). Nevertheless, scholars have suggested that addressing livelihood and climate related issues would indirectly shape migration (Ellis, 2000; Piguet, 2018; Hoffmann et al., 2019). To guide the investigation into this complex relationship between governance, climate change and migration, this study adopted the Sustainable Livelihood Approach as its conceptual framework. Moreover, concepts such as structures, human agency and duality of structures of the structuration theory are integrated into the framework as these resonate with the transforming structures and processes, and livelihood strategies of the SLF. This is shown in figure 2.2 below:

Figure 2.2: Conceptual Framework



Source: Adapted from Carney et al. (1999)

The first component of the SLF is the vulnerability context. As revealed by the literature, the main livelihood of local farmers is rain-fed agriculture. This has, however, been adversely affected by climate related hazards such as prolong drought, fluctuating/irregular rainfall, extreme temperature and floods, thereby exacerbating existing socioeconomic vulnerabilities of households. These hazards produce varied degrees of shocks, trends and seasonality (Carnon et al., 2003). It should, however, be noted that these hazards do not work in isolation, but they interact with non-climate related hazards such as decreasing soil fertility, crop pest/disease, livestock disease, high input sales, low output sales, etc. to deepen livelihood losses. For instance, the effects of prolonged drought and heavy rainfall result in the removal of the top fertile soil through erosion (Antwi-Agyei & Nyantekyi-Frimpong, 2021). Decreasing soil fertility also leads to low crop yield, which subsequently causes low income and increased incidence of poverty and possible outmigration (Aniah et al., 2016; Fielmua, 2017; Teye et al., 2021). The degree of households' vulnerability is hinged on the crucial role of the transforming structures and processes.

The framework also shows that in the midst of the vulnerability, the rural poor people are exposed to a combination of assets, including human asset/capital, natural asset, physical asset, financial asset and social assets (Carney et al., 1999). In spite of the impact of climate change on livelihoods, households rely on their human assets such as farming experiences, abilities, work skills and good health to diversify livelihoods in order to minimise vulnerability. More so, some household members rely heavily on their social asset/capital such as migrant networks, seasonal migration and permanent migration and local associations to boost their livelihood needs (Vinke et al., 2021). Interplay between livelihood asset and livelihood strategy is revealed in migration acting as both an asset and a strategy for some households. Farming households make judicious

use of their natural asset such as land, water and natural vegetation. As agrarian communities, farmers consider land as very important as they cultivate drought resistant crops even in the dry season (DFID, 2005). Farming households also draw on financial assets, which extend to the existence of cash or its equivalent that enhances the adoption of diverse livelihood strategies. Migrant remittances are classified as financial assets to some households. Lastly, households take advantage of available physical assets comprising of basic infrastructure such as good roads, market, affordable transport, dams/irrigation facilities to achieve their livelihood goals. The framework shows a symbiotic relationship between the vulnerability context and livelihood assets (DFID, 2005). The interplay between these two components alludes to Holt-Jensen's (1999) principle of duality of structures expressed in the structuration theory (Giddens, 1984).

The third component of the framework outlines the transforming structures and processes deemed crucial for shaping livelihood assets for the realisation of livelihood strategies. The component can be appreciated from two main perspectives namely, processes and structures. The processes catalogue the various national level policies such as SADA, 1V1D, 1D1F and FSP that are analysed in the study. The structures that form an integral part of the structuration theory involve existing local institutions, which could be economic, social, political and environmental. For instance, while family systems and friends are social informal local institutions and actors, district agriculture department could also be classified as a political structure. Though land tenure system is multi-dimensional, it is predominantly considered as a social, economic and political structure (Mensah et al., 2022). The combined effect of these structures and processes is crucial for shaping households' access to livelihood assets and livelihood strategies which are crucial for minimising vulnerabilities. This phenomenon also affirms Sibeon's (2004, p.53) postulation that structures can enhance or constrain human agency. For instance, the role of the

national fertiliser subsidy programme in shaping declining soil fertility of households whose main source of livelihood depends on it is pivotal in determining the propensity to which people adopt migration as an alternative livelihood source (Nuhu & Wale, 2023). Nonetheless, outmigration is a social transformational phenomenon, which does not assume a mono-causal link but it is the outcome of the interaction of multiple factors including aspiration and capabilities (de Haas, 2021; King, 2012; Massey, 2018).

The next component focuses on the strategies, plans and activities adopted to realise livelihood outcomes. Giddens (1984) refers to these strategies as human agency. These strategies as shown in the framework include seasonal and permanent migration, possible in-situ adaptation strategies (Carney et al., 1999). However, existing assets, transforming structures and processes, shape these strategies, and are further determined by factors that drive the vulnerability context. For instance, one's financial assets and government's migration policies at both origin and destination influence one's outmigration. The relationship between livelihood assets and transforming structures and processes alludes to Giddens' duality of structures (Holt-Jensen, 1999; Leach et al., 1999, p. 230). For instance, though environmental structures may adversely disrupt livelihoods of households thereby deepening their vulnerabilities, household members who have the capabilities are able to adopt seasonal migration to deal with livelihood losses (Awuse & Tandoh, 2016; Fielmua, 2017; Van der Geest, 2011).

The last section of the framework shows the livelihood outcome of the interactions between vulnerability, assets, transforming structures and processes and livelihood strategies. These outcomes or goals may include either increased or decreased outmigration, improved food security, reduced vulnerability, increased income or remittances and job creation (Carney et al., 1999; DFID, 2005).

## CHAPTER THREE

### STUDY AREA AND RESEARCH METHODOLOGY

#### 3.0 Introduction

This chapter provides a description of the characteristics of the study areas and the methodology employed in the study. These characteristics include location and size, climate, topography and drainage, population, political administration, education, and livelihoods of the districts. The section under methodology catalogues different methods and techniques employed in this study comprising of research design, sampling techniques, methods of data collection, instruments for data collection, data processes and analysis, ethical considerations, and limitations of the study. The researcher's positionality in relation to this study is also described in this chapter.

#### 3.1 The Study Area

The study was conducted in the Wa West District and Jirapa Municipality of the Upper West Region of Ghana using six farming communities. These communities are Kpanfa, Siriyiri and Siiru in the Wa West District, and Kunzokala, Pinyiri and Sabuli in the Jirapa Municipality. The region was selected for this study because of the increasing cases of interactions between climate change and socioeconomic situations exacerbating the vulnerability of the people such as high poverty levels (Teye et al., 2021). According to the GSS (2015), the region is noted as the most deprived in the country, having nine out of every ten persons living on less than US \$1.90 per day. The high poverty level in the region is generally ascribed to the nonexistence of important natural resources and the impacts of climate activities (Teye et al., 2021). In response, individuals and households embark on diverse forms of migration including permanent, seasonal and circular which can be both internal and international to cope with and adapt to climate perturbations (Awuse & Tandoh, 2016; Fielmua, 2017; Jarawura & Smit, 2015). It is against this

backdrop that this region was selected for this study to examine how various governance contexts play into the relationship between climate change and migration. More so, this study is an integral part of the Governing Climate Mobility (GCM) project which started in 2019, and sought to investigate the possible links between climate change, mobility practices and governance, in the aforementioned study areas and also in the Eastern region. As a result, these purposively sampled study sites in the UWR were also selected for this study.

According to Sam et al. (2020), the Upper West region is one of the most vulnerable regions to the impacts of climate change in Ghana. This is partly because the region is located within the semi-arid Guinea Savannah belt, with one season of rainfall from April/May to October (Rademacher-Schulz et al., 2014). The Upper West Region was carved from the Upper Region, which itself was formerly part of the Northern Region in July 1960 (Bening, 1999). As part of implementing the then government's decentralisation policy in 1983, the Upper Region was demarcated into Upper West and East. Geographically, the region was described as the youngest in Ghana until December 2018, when six more regions were created by the current government.

The Upper West Region is located in the northwestern part of Ghana and situated in the middle of longitudes 1°25'W and 2°50'W, and latitudes 9°35'N and 11°N. The region which has a total population of 901, 502 (which is 2.9 % of Ghana's total population) and covering a total land area of 18, 476 square kilometres, is also bordered by Burkina Faso to the west and north, Northern region to the south and Upper East region to the east (GSS, 2021). In addition, the location of the Upper West Region in the sub-equatorial zone, which is characterised with unstable wind pattern also accounts for the region's single rainfall trend. Whilst the North-East Trade Wind influences the area during the dry season, the South-West Monsoon Wind affects the rainy season. According to Owusu & Waylen (2009), the area experiences nearly a mean annual

rainfall of 1100 mm. Distribution of rainfall in the area is not stable as it changes from year to year. For instance, in some years, the region witnesses an initial rain in April and May, which precedes a short dry influence of thirty-five days, leading to severe crop failure. The major economic activity in the region is agriculture, which employs about 80 percent of its economically active labour force (GSS, 2018). Given this context, it is crucial to examine the perspective of climate change perturbations and environmental impacts. The main characteristics of the two districts are described in the ensuing sub-sections.

### **3. 1. 1 Wa West District**

As mentioned earlier, the WWD and the three communities, Kpanfa, Siriyiri and Siiru were purposively selected for the study. The selection was informed by the fact that the district is the poorest in Ghana, with 84.7% of its economically active population engaged in rain-fed agriculture (MoFA, 2017). This calls for an investigation into climate impacts on household's livelihoods, migration practices and how governance shapes these variables.

#### **3.1.1.2 Location and Size**

Found in the region located in the Northwestern corner of Ghana, the WWD is located in the western part of the UWR. The district, which was formerly part of the erstwhile Wa District, was created in 2004 by the Legislative Instrument 1751. This was created in addition to the Wa Municipal and Wa East District (Kusakari et al., 2014). Approximately, the district lies in the middle of longitudes  $9^{\circ} 40''$  N and  $10^{\circ} 10''$  N, and latitudes  $2^{\circ} 20''$  W and  $2^{\circ} 50''$  W. It shares border with the Northern Region to the south, Nadowli-Kaleo District to the northwest, Wa Municipal to the east and Burkina Faso to the west. The total land size of the area is estimated as 1492 square kilometres, which constitutes approximately 10% of the region's total landmass.

According to the GSS (2014), the district capital, Wechiau, is also estimated as 150 kilometres from the Wa Municipality.

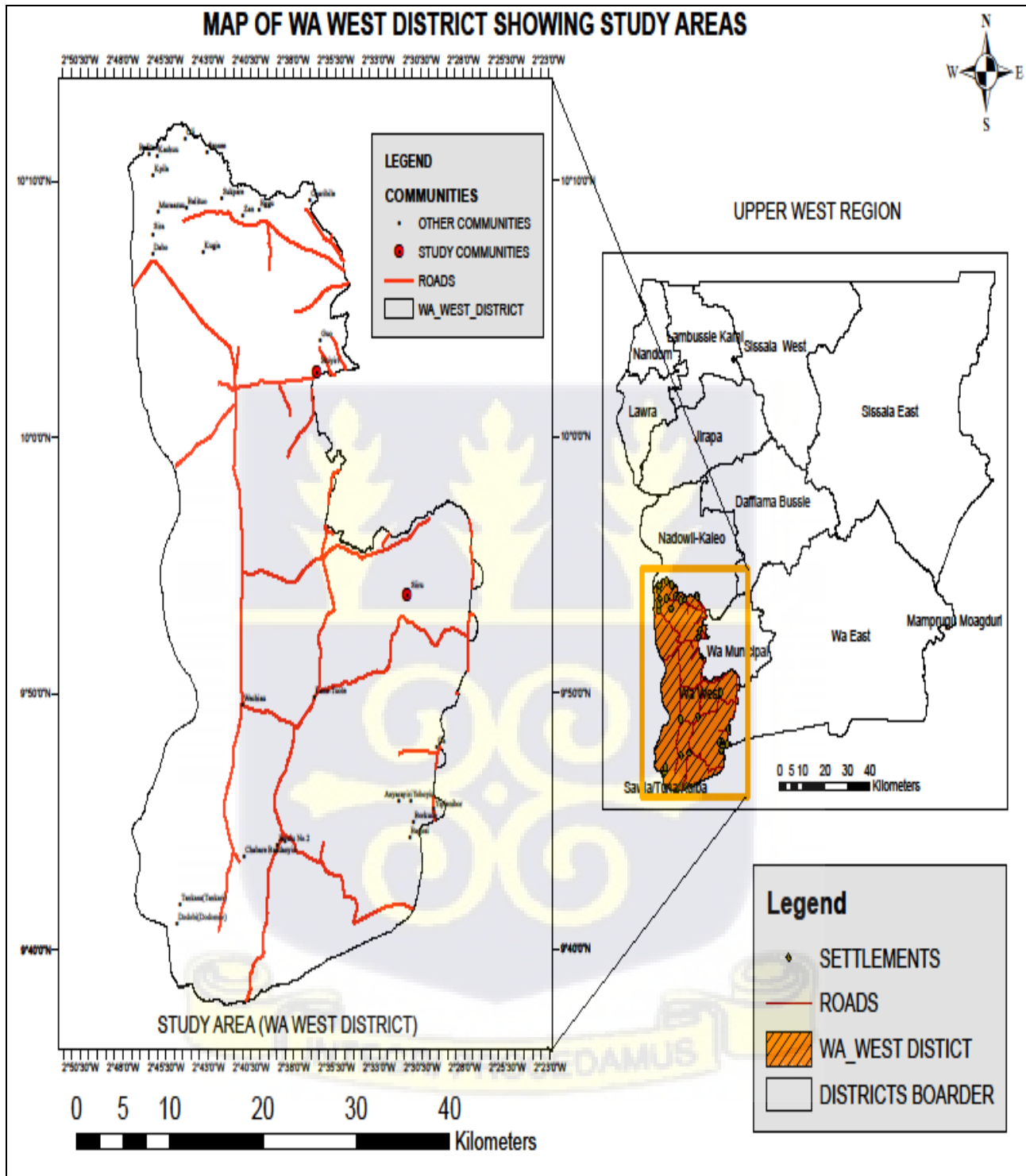


Figure 3.1: Map of Wa West District Showing the study communities.

### 3.1.1.3 Climate and Vegetation

The WWD has a tropical continental form of climate with an annual average temperature between 22.5°C to 45°C. A peculiar but not well-known and less exploited environmental asset in the district is the changes in the diurnal temperature. In the months of November to February, the harmattan period, the district experiences relatively cool temperatures ranging between 18°C to 22°C compared to hot temperatures rising between 38°C to 40°C in the day. The District's records reveal that "the relatively cool nights are very suitable for stimulating good flowering in fruits and vegetables, heavy fruit setting and good ripening and colour turning in fruits" (Teye et al., 2021). This climatic resource, if well harnessed, can give the northern region and for that matter the WWD, an advantage of generating additional livelihood opportunities. Whilst the district experiences hottest temperature between the months of February and April, the activities of the Tropical Maritime Wind bring the only wet season, which spans from April to October. The area also records a mean annual rainfall ranging between 840mm and 1400mm. This pattern of rainfall is apt for effective agricultural activities within only four months in a year. Youth outmigration and its accompanying factor of weak human resource base are the products of unreliable rainfall regimes (GSS, 2014).

The WWD is located within the Guinea Savannah Zone with peculiar characteristics of short grasses, woody shrubs and trees (WWDA, 2017). The major trees in the area which are resistible to drought and fire include baobab (*Adansonia digitate*), dawadawa (*Parkia biglobosa*), kapok (*Ceiba pentandra*), and shea trees (*Vitellaria paradoxa*). In addition to these common trees are commercial ones such as Cashew and Mangoes. The vegetation in the area is useful for rearing of animals, which also serves as a major source of income to households. Despite this, the vegetation is severally hampered by long period of drought with its subsequent effects of drying

grasses and burning of leaves. These acts remove the vegetation cover exposing it to soil erosion with the onset of the heavy and torrential rainfall. This has serious ramifications for transpiration and mean annual rainfall. Moreover, studies have revealed that human activities such as cultivation, over-grazing, charcoal burning and bush fires cause the waning of sizeable proportion of the natural vegetation in the district (Kusakari et al., 2014; Teye et al., 2021). This brings up the concerns of the role of governance in formulating concrete measures to avert environmental degradation and the killing of important microorganisms.

#### **3.1.1.4 Topography, Drainage and Soil**

Relatively, the Wa West District has a similar topography to the Jirapa district with a gently rolling terrain and a few hills ranging between 180 and 300 meters above sea level. Nonetheless, there are dissimilarities between the districts about drainage systems. The WWD is drained by one main river—the Black Volta. The river marks the boundary between the District and the Republic of Burkina Faso. The Black Volta with its tributaries is the main drainage system in the District. The river flows through the year and together with its several seasonal tributaries provide huge irrigation potentials to the people. This potential, however, has not been tapped yet. For now, a few farmers by themselves or through the support of NGOS are able to draw water from the river to irrigate crops mainly in the dry season. More so, water harvesting from boreholes has been successful in the area because the rocks have well-developed fracture system. The Black river and its tributaries also provide opportunities for fishing mainly by men. The women take charge of roasting and drying the fish and its marketing (GSS, 2015).

Three major types of soils are found in the district. These are Leptosols, Lixisols and Vertisols. Floor covering Fluvisol soil along the flood plains of the Black Volta as well as sandy loams along some of its tributaries. Generally, the nature of the soils in addition to conventional land

use practices and declined volume of rainfall, have negative impact on the production of crops. This accounts for the youth outmigration to nearby villages or urban areas to seek other means of survival to the detriment of their lives and health.

### **3.1.1.5 Demographic Characteristics (Population, Age, Sex and Education)**

According to the 2021 PHC, the WWD has a total population of 96, 957, representing 10.8% of the UWR's total population. The Census revealed that the district has a total of 51, 077 (52.9%) female and 45, 880 (47.3%) males. This indicates that the females in the district are more than the males. The district according to the census data, has 17,744 households with an average household size of 5.4 (GSS, 2021). Unlike the 2010 HPC, the 2021 PHC has revealed that 100% of the population in the municipality are rural dwellers (GSS, 2021). Similar to other districts in the region, the WWD has a youthful population which constitutes 45.5% of its entire population. This presents a wide-base population pyramid with a small percentage of an elderly of dependency ratio for males higher (118.2) than that of females (94.6). The sex ratio of the district is 97.8. Wa West also has a very youthful population with residents aged 5-9 years constituting 16.5%; those in the 0-14-year range constitutes 45.5%. The adult (15 to 64 years) population constitutes 48.7% while those aged 65 years and older makes 5.8%. The sex ratio is 97.8 which implies that for every 100 females, there are about 98 males (GSS, 2014).

Like all other districts in the region, the WWD has a high illiteracy rate as against literacy rate. According to the 2021 PHC, the district has a higher proportion of females (57.6%) than males (42.40%) of its inhabitants of 6 years and above being illiterates (GSS, 2021). According to the GSS (2014), the Jirapa Municipality and the WWD share similar trends about higher percentage of the population of both districts being illiterate and higher percentage of the male population than their female counterpart being literate.

### 3.1.1.6 Livelihoods

The main sources of livelihoods, which employs larger proportion of the labour force (84.0%), in the district, are agriculture, forestry, and fishery industry. However, data from the GSS (2018), show that as much as 91.6 percent of households in the district are engaged in agriculture as their main source of livelihood. Nonetheless, the type of agriculture practiced is rain-fed, with only few communities involved in dry season farming due to their access to reservoirs and small-dams built by development agencies (Kusakari et al., 2014). A majority (97.2%) of them are engaged in crop farming, with crops such as groundnut (*Arachis hypogea*), millet (*Pennisetum glaucum*) guinea corn (*Sorghum bicolor*), maize (*zea mays*) beans (*Phaseolus vulgaris*) and yam (*Dioscorea spp.*) mainly cultivated in the district (GSS, 2015). The above suggests that the Wa West District and the Jirapa Municipality have similar livelihood activities as greater proportions of the two districts are engaged in agriculture. This confirms the relative deprivation and rural nature of the area. It is necessary to emphasise here that, the district is not only considered as the most deprived in the Upper West region, but also the poorest in the entire country (GSS, 2018). A clear relation can be drawn between weak agricultural systems and livelihoods and the high poverty cases in the district. This also raises the question of how governance at both local and national levels plays out in the district. With the majority of the labour force engaged in agriculture, forestry and fishery, little attention is paid to other livelihoods sources such as mining and quarry, construction, accommodation, manufacturing and education (WWDA, 2017). The good thing, however, is that there is market for the agricultural goods since the district is food basket of the regional capital. It has been suggested that the district could take advantage of its proximity to Burkina Faso, to be a part of the Savannah-Sahel Regional Market proposed by the Savannah Accelerated Development Authority (Teye et al., 2021).

### **3.1.1.7 Political Administration**

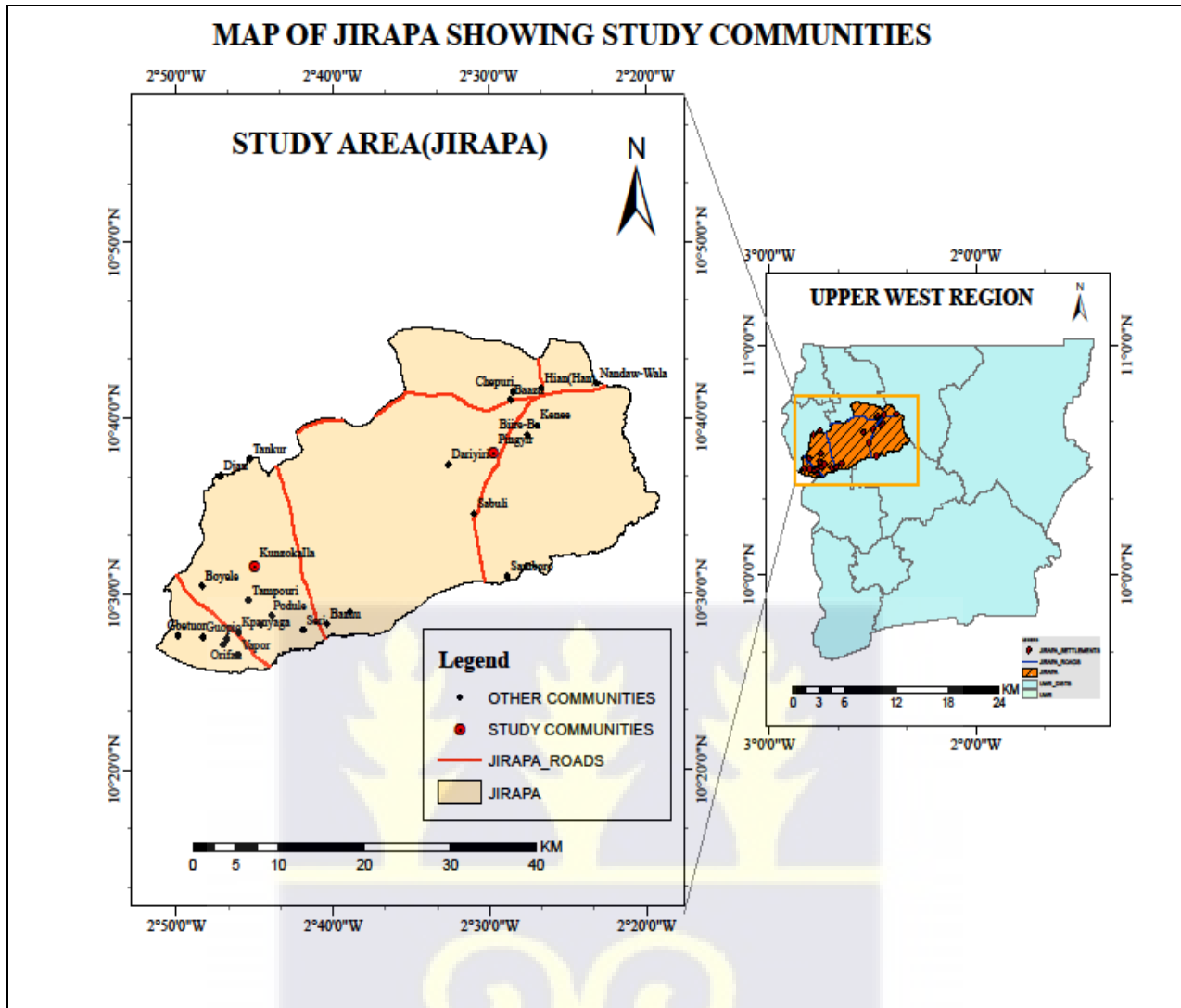
The Wa West District Assembly has an administrative membership of 35 people comprised of 27 elected members and 8 government appointees representing the traditional authority and organised economic groupings in the District. The district has five area councils namely, Dorimon, Ga, Gurungu, Vieri and Wechiau. These councils together yield 140 Unit Committees.

### **3.1.2 Jirapa Municipality**

The Jirapa Municipality which forms part of the 11 Municipalities and Districts in the UWR, is one of the 261 MMDAs in Ghana. The Municipality established by a Legislative Instrument (LI) 1902 was in 2007 carved out of the previously known Jirapa-Lambussie District as part of the government's decentralisation programmes (GSS, 2018). The district was elevated to the status of a municipality in 15th March, 2018. Jirapa is the municipal capital for the Jirapa Municipal Assembly.

#### **3.1.2.1 Location and Size**

The Jirapa Municipality is located in the northwestern corner of the region. It lies between latitudes  $10.25^{\circ}$  and  $11.00^{\circ}$  North and longitudes  $20.25^{\circ}$  and  $20.40^{\circ}$  West (GSS, 2014). In terms of landmass, it is reported that the municipality has a territorial area of 1, 188.6 square kilometres which constitutes 6.4 % of the Upper West regional landmass (GSS, 2014). The Municipality shares boundaries with Nadowli-Kaleo District to the south, Lambussie Karni District to the north, Lawra District to the west and Sissala West District to the east (GSS, 2018).



**Figure 3.2: Map of Jirapa showing the study communities**

### 3.1.2.2 Climate and Vegetation

The Jirapa municipality is located in the tropical continental climate zone, with a mean annual temperature ranging between 28<sup>0</sup>C and 31<sup>0</sup> C. Given the mean annual temperature, it has been suggested that the municipality has the potential for the development of solar energy, which could be an alternative power source to electricity. The municipality is characterised by a single rainfall regime, which is reported to run from April/May to October after which the area is characterised by a long dry season from November to March (GSS, 2014). The single rainfall

regime is induced by the tropical monsoon winds with a concentration ranging from 1000mm to 1100mm annually and humidity rising between 70% and 90% during the dry season. The phenomenon of single rainfall followed by a long period of drought indicates that the Jirapa municipality is susceptible to the effects of climate change and variability especially the agriculture sector.

Generally, the vegetation of the municipality is the Guinea Savannah Woodland, which has light under growth and dispersed medium-size trees, shrubs and grasses (Sam et al., 2020). In the municipality, the main trees which also provide economic livelihood for some households, are baobab, dawadawa, neem and shea (GSS, 2020). The natural vegetation and for that matter the environment in the municipality is adversely hampered by human activities such as bush burning, charcoal burning, improper farming activities, felling of trees and sand and gravel quarrying (Jirapa Municipal Assembly, 2018). Though the municipality cannot boast of any forest reserves, few pockets can be located along the Black Volta in communities such as Somboro, Tuolong and Yagbetuolong. These isolated pockets of forests are however, yet to be developed (Jirapa Municipal Assembly, 2018).

### **3.1.2.3 Topography, Drainage and Soil**

Largely, the municipality's landscape is flat and low-lying comprising of an average height of about 300m above sea level. In spite of its low-lying nature, Jirapa Municipality has a few plateau surfaces rising between 300m and 350m (GSS, 2020). The plateaus are located in both Jirapa and Yagha. Unlike the WWD, the Jirapa municipality is mainly drained by the White Volta, which is traceable along villages such as Gbetouri, Tuolon and Orifani. In addition, the municipality is connected with seasonal tributaries of the Black Volta through areas such as

Bakpong and Ullo at Baazu, Dazuuri and Telenbe at Tizza (Sam et al., 2020). Not much of this river is tapped for irrigation purposes.

The main soil typology found in the municipality is sandy loam, which is underlain by hard iron pans. On a wider scale, the sandy loams are beneficial for the production of cowpea and groundnuts. According to the Jirapa Municipal Assembly (2018), large expanses of fertile soils are located in Han, Mwankuri and Somboro communities.

#### **3.1.2.4 Demographic Characteristics (Population, Sex and Education)**

According to the 2021 HPC, the Jirapa municipality has a total population of 91,279, representing 10.12 % of the total population of the UWR. The census data further reveal that the municipality has a total of 48, 258 (52.8 7%) females and 43, 021 (47.13 %) males (GSS, 2022). Like the WWD, the Jirapa municipality has more females than males. In terms of rural-urban distribution, the 2021 PHC again shows that whilst 79.26% of the population live in rural areas, only 20.74% dwell in urban centres (GSS, 2021). It can be deduced that higher percentage of the population would be involved in natural resource based economic activities such as agriculture.

Literature suggests a link between education, human resource development and economic growth (UNDP, 2011). Akin to the WWD, illiteracy rate among females (55.8%) is higher than males (44.2%) for inhabitants of 6 years and above (GSS, 2021). This calls for affirmative actions to equip the educational level of females accordingly in the municipality so they can contribute sustainably to development in the municipality and for that matter the country at large.

#### **3.1.2.5 Political Administration**

The political administration of the municipality consists of the Municipal Assembly which is headed by the Municipal Chief Executive and the Municipal Coordinator as the administrative

head and principal adviser to the Municipal Chief Executive. For effective participation in decision making at the grass-roots level, the Municipal Assembly is divided into Town and Area Councils. According to the Local Government Act, 1993 (ACT 462, 3,3), a settlement or town with a population of 5,000 or more qualifies to be a Town Council and an Area Council is one that is made up of two or more towns which collectively have a population of at least 5,000. Based on the above criteria, literature suggests that the Jirapa Municipality has one (1) Town Council, seven (7) Area Councils and 37 Unit Committees (GSS, 2014).

### **3.1.2.6 Livelihoods**

The economy of the Jirapa municipality is characterised by agricultural activities, services, agro-processing and small-scale manufacturing activities (Sam et al., 2020). Agriculture is documented as the main economic activity, which engages 71% of the population of the municipality, and it is subsistence in nature (GSS, 2020). Few farmers, however, undertake large-scale cultivation of cereals and legumes in Han and Mwankuri within the municipality. Other major crops cultivated in the municipality include groundnut and yam. To supplement crop production, it is reported that the inhabitants rear cattle, sheep, goats, pigs and poultry with large-scale livestock production in the Han and Ping areas (Jirapa Municipal Assembly, 2018). Along with this, cash crops such as Cashew and Mango are also cultivated. Naturally, tree crops like dawadawa and shea grow on farms. Like the WWD, majority of the people in the municipality are very poor (GSS, 2020).

## **3. 2 Research Methodology**

Research methodology is the process or method adopted by a researcher to conduct a study. It reveals the systematic pathways researchers employ to formulate their problems, set their objectives and report their findings from the data gathered from the field (Jonson &

Onwuegbuzie, 2004). It ultimately reveals the approach the researcher employs to guarantee valid and reliable outcomes that deal with the objectives of the study. Research methodology also comprises of the type of data the researcher is seeking to collect and from which study sites, as well as the method of data collection and analysis. The research design used is discussed in the following sections.

### **3.2.1 Research Design**

In simple terms, research design refers to the framework or a plan of study that is applied as a guide in the collection and analysis of data. It can be viewed as the structure of the research or it is a systematic structure of inquiry (Holland & Campbell, 2005). Even though there are diverse forms of research designs (Creswell & Clarke, 2011; Holland & Campbell, 2005; Teye, 2012), the widely known and applied ones include quantitative research design, qualitative research design and mixed methods research design. Given that the application of mixed methods guarantees that the strengths and weaknesses of individual methods would be compensated for (Creswell, 2009; Meeto & Temple, 2003), this study adopted this research design. Mixed methods is defined as “a class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts in a single study” (Johnson & Onwuegbuzie, 2004). In addition to complementarity purposes, using this method in a single study is beneficial because, whilst the qualitative method is said to be flexible and efficient for the acquisition of core comprehension of particular situations (Johnson & Onwuegbuzie, 2004; Teye, 2012; Winchester, 2005), the quantitative paradigm, however, makes room for comparison, generalisation and predictions (Bryman, 2001; Holland & Campbell, 2005). For instance, given that some aspects of the study focus on household experiences with and perceptions about climate hazards, opinions of local farmers on governance efforts in shaping

livelihoods and migration decisions of households, quantitative method will not be appropriate in gathering these details. More so, as the qualitative method is not fit for making generalisations about the impacts of climate change on livelihoods and outmigration rate of households, the quantitative approach is considered as more convenient. These contexts provide the justification for using mixed methods approach in this study. However, criticisms of using the two methods in a single study are skewed towards qualitative study more than the quantitative approach. Whereas the qualitative method is labelled as being subjective and ungeneralisable, quantitative paradigm is seen as objective, generalisable and value free (Teye, 2012; Winchester, 2005).

As there are diverse forms of mixed methods research designs, the sequential explanatory mixed method was used in this study. This method entails the application of one method for data collection and analysis followed by another for the same purpose (Clake, 2009; Creswell, 2014; Tashakkori & Teddlie, 2010; Teye, 2012). With this method, the quantitative or survey data collection and analysis precedes the qualitative data collection and analysis (Teye, 2012). This is to enable the findings from the qualitative data offer explanations to unique and emerging dynamics, trends and patterns gathered from the quantitative survey. Using the quantitative method, the study employed household questionnaire administration to collect and analyse the primary data. This methodological triangulation offered the researcher the opportunity to adopt varied techniques such as surveys, focus group discussions and in-depth interviews sequentially to study how governance issues play into climate change adaptation and migration in the study areas. In the following sections, both the quantitative and the qualitative methods are discussed in the context of their data sources and the various data gathered.

### 3.2.2 The Quantitative survey

Through open-ended and closed-ended questionnaire administration, the quantitative data were mainly collected from primary sources. The survey was useful for examining farming household's experiences on climate change including changes in rainfall and temperature over time, drought and floods, impacts of climate change on livelihoods, migration as a strategy to deal with climate change and background variables in the various communities of study. This approach of data collection aided in reaching large proportion of households, thereby acquiring a wider range and diverse opinions on climate impacts on livelihoods, adaptation strategies, migration practices, and national policies and local institutions in the study areas (Creswell & Clark, 2011). Furthermore, this method helped in facilitating comparison of the different experiences of the phenomenon by respondents in the Wa West District and Jirapa Municipality, and also employing the findings to make generalisation on the relationship between the impacts of climate change on livelihoods, migration and governance (Johnson & Onwegbuzie, 2004).

As part of the GCM project, the questionnaire administration was done at the household level, with male and female household heads or any knowledgeable person as the respondents. The respondents included household heads who were 18 years and above and should be farming for more than five (5) years in the community. This inclusion criterion was applied because there was a higher possibility that such respondents might have gained some level of experience in farming, and as a result have been exposed to some level of climate impacts on crop production. The questionnaires were administered in people's homes.

Under the bigger study, there was piloting of the survey instrument where thirty households in a community with similar features as the study communities were surveyed. According to De Vaus (2014), Fink (2013) and Krosnick (2018), piloting survey questions outside the main study areas

will not only help identify potential errors in the questions but also enhance clarity, reliability and validity of the instrument. Buttressing the authors' assertion, the piloting was done to enable the research team test the wording of survey questions, length of the survey, clarity of questions, and appropriateness of answer options. More so, the pre-testing was done to help fish out any typos, grammatical errors, unnecessary repetitions, survey numbering mistakes. This was to further ensure that the CAPI (Computer-Assisted Personal Interviewing) the researchers were going to use for the main data collection was correctly programmed especially the skip logic. As indicated earlier, the pre-testing was useful in checking the validity and reliability of the survey instrument. To strengthen the reliability of the survey instrument, the test-retest reliability technique was used. With this technique, the researcher administered the questionnaire with a group of respondents and repeated the survey with the same group at a different time. The responses from the two time points were compared. The consistency in the responses guaranteed the reliability of the instrument. In this study, a household head was defined "as a male or female member of the household recognised as such by the other household members" (GSS, 2014, p. 12). Given that this study is an integral part of a bigger GCM project, during its quantitative data collection in 2020, the research questions were administered along with the GCM survey. Enumerators were trained along with the GCM's team of enumerators.

### **3.2.2.1 Sampling**

As already stated, majority of households in the study areas engage in agriculture as the main source of livelihood. To this end, the study used households as the smallest unit of analysis, and was conceptualised as a household for which the main livelihood activity of the household head was agricultural production. The sample size was determined by taking into consideration the characteristics of the population under study as well as the objectives. The survey involved an

administration of a questionnaire on a sample of 300 households selected from the two districts in the Upper West Region.

In this study, a three-stage stratified sampling design (Bryman, 2001) was used to select 50 households each in the 6 communities or Enumeration Areas (EAs) or primary sampling units as follows. The study purposively selected the Upper West region of Ghana, where evidences of the impact of climate change and migration exist, to ensure that it will be more feasible to problematise governance issues. At the second stage, the study employed the techniques of purposive sampling to select two districts in the region, and 6 enumeration areas in all (i.e. 3 from each district). This third stage involved the selection of 50 households from each of the 6 selected Enumeration Areas (this gives a total of 300 households in the two districts). Using EA maps that were obtained from the Ghana Statistical Service, the researcher together with trained Field Assistants took a sweep of each EA to enumerate and list all inhabited domestic addresses. A systematic sampling technique with a random start was then used to select 50 households in each EA. The sampling interval was calculated by dividing the number of households in the EA by 50. Data were collected by visiting sampled households during a period in which fieldwork was being conducted within a given area. The household head or any knowledgeable representative of the household was made to answer the questionnaire on behalf of the households. Given that household heads in the region tend to be males, it was expected that more males would end up answering the questions than females. Table 3.1 shows the various communities in each district and their corresponding sampled respondents.

**Table 3.1: Sample size**

Region /Location	District/Municipal Assembly	Community	Sampled size		
			Male	Female	Total
Upper West Region	Wa West	Kpanfa	27	23	50
		Siiru	33	17	50
		Siriyiri	27	23	50
		<b>Total</b>	<b>87</b>	<b>63</b>	<b>150</b>
	Jirapa	Kunzokala	29	21	50
		Pinyiri	24	26	50
		Sabuli	29	21	50
		<b>Total</b>	<b>82</b>	<b>68</b>	<b>150</b>

**Source: Field survey, 2020**

### 3.2.3 The Qualitative Methods

With the qualitative method, techniques such as focus group discussions, in-depth interviews and key informant interviews were used to collect data from both primary and secondary sources. These techniques were employed to examine particularly the role of national policies and local institutions in shaping livelihoods and migration decisions of household members. Moreover, to understand how households had access to livelihood resources, adaptation and mobility practices, these techniques were employed. This approach guided the researcher to elaborate on the quantitative data to assess the convergent and divergent opinions of the respondents on the topic under investigation. It would have been difficult to gather all these details using only the quantitative approach. This, therefore, resonates with the complementarity principle of using a mixed method design in a study (Johnson & Onwuegbuzie, 2004; Subedi, 2016; Teye, 2012).

Two graduate students from the University for Development Studies, Wa Campus, who were also involved in the GCM data collection, were again trained for this study. Their selection was informed by the fact that they hail from the WWD and JMA respectively, and could fluently speak their indigenous languages. Aside schooling, these field assistants also engage in crop

farming in their respective communities and could easily relate with the topic under investigation. Due to language barrier, the researcher's participation was minimal as he could only interview community members who were educated and could express themselves in English.

A workshop was organised to train the field assistants on the interview guide for each category of participants. They were thoroughly taken through the guide page by page to ensure that omissions and inconsistencies were rectified to enhance the data quality. Concepts such as 'climate change', 'governance', 'adaptation strategies' and 'migration' that might be difficult to interpret in the local language were discussed and agreed upon for better comprehension. Both the Waala and the Dagaare languages were used for the discussions with the natives. At the training, close attention was paid to ethical considerations and COVID-19 protocols. The various qualitative data collection techniques used in this study are elaborately discussed in the following sub-sections.

### **3.2.3.1 Focus Group Discussions**

A focus group discussion is a “carefully planned discussion designed to obtain perception in a defined area of interest in a permissive, non-threatening environment” (Krueger, 1988, p. 18). Focus group discussion is also defined as “a group interview on a particular topic, led by a trained moderator... the goal of the focus group is to provide useful insights on the topic” (Collins & O'Brien, 2003, p. 142). The method was employed to examine the “different feelings and meanings” (Conradson, 2005) that various people in climate affected communities and households express about how national policies and local institutions shape livelihoods and migration.

The focus group discussions were conducted using an interview guide (Appendix B). The guide was divided into four sections. The first section had questions on the background characteristics of the participants including their migration status. The second section had questions relating to the participants' experiences with climate change and its impacts on their livelihoods. Participants were expected to share their experiences on rising temperatures, unpredicted rainfalls, drought, floods and other forms of experiences the communities have witnessed within the last five years. Aside this, the section also implored participants to identify their various sources of livelihoods such as crop farming, fishing, trading, civil service, livestock and so on. Moreover, discussants were impetrated to indicate how climate and non-climate related hazards adversely affected their sources of livelihoods, and the strategies they employed to deal with the impacts. The third part of the guide explored migration as a coping or an adaptation strategy to deal with the negative effects of climate change. Here, participants were to discuss the reasons for which people migrate, main destinations, duration of stay, migration as a coping strategy, remittances and other supports from migrants, reasons for non-migration of people who wanted to migrate, and the effects of migration on the entire community. The last part of the FGD guide had questions bothering on the role of national policies and local institutions in shaping livelihoods and climate-induced migration. This section basically entreated participants to identify the various forms of assistance received and which organisations or institutions provided these supports. Participants were to discuss how the various national policies, initiatives and programmes such as 1V1D, SADA, 1D1F, NFSP and so on, shaped their sources of livelihoods and migration decisions.

On the whole, seven (7) FGDs were conducted with one (1) FGDs each in five (5) communities and two (2) in the last community (with relatively larger number of households). In line with

Krueger's (2002) principles of a preferred number of participants in FGDs, each group was made up of participants ranging between 6 and 8. This was to foster effective group control strategy, as any focus group with participants more than 8 may be difficult to control (Krueger & Casey, 2002). The participants for the FGDs were categorised into three different groups including males, females and mixed groups. There were separate groups for both men and women. This was to allow them to express their opinions about the topic under discussion freely (Adams et al., 2008). Especially women were separated from men during the focus group discussions because, in such traditional societies, women do not feel comfortable debating with men. However, the mixed group, which applied to both adults and youth, was created in order to observe the power dynamics in the study communities where patriarchal norms are predominant, as this study focuses on how governance shapes climate adaptation and mobility practices. To ensure gender equity, each group had at least two or three women depending on the total number of participants in a group. The groups mainly comprised of farmers with more than five years of farming experience, petty traders and returnees or migrants. In the case of the farmers, it was assumed that five (5) years farming experience was enough for them to give detail accounts of the impacts of climate change on their activities. Moreover, it was expected that farmers could properly appraise the role the central government and local institutions play in shaping their farming activities. Some of the respondents also shared their experiences on migration. Part of the discussants were selected based on the exclusive information they provided during the survey data collection that needed clarification. Moreover, focal leads were hired to help recruit other participants after exhausting the list I had. This was to enable the researcher get the required number of participants in a group.

**Figure 3.3: Research Assistant in a FGD with local farmers in Kunzokala**



**Source: Fieldwork, 2022**

### **3.2.3.2 In-depth Interview**

The in-depth interviews were conducted in two phases. The first phase was conducted with opinion leaders within the communities. Among the people recruited for the interviews were chiefs, assembly members, women leaders, chief farmers, returnees and youth leaders. These people were selected based on the unique information they provided during the quantitative data collection. Since the questionnaire contained details such as names and contact numbers of the respondents, the researcher together with the research assistants called these respondents and arranged to conduct interviews with them. Moreover, as these individuals represented a cross-section of their respective communities, the assumption was that the views of the communities would be well represented (see Crossman, 2021). The same interview guide that was used for the focus group discussions was also used for this category of the in-depth interviews. Chiefs were

purposively selected to give accounts on issues of land tenure, access and control of farmlands. Aside from this, the interviews of chiefs and elderly men and women were meant to solicit information on historical accounts and trends of changes in climate and migration patterns in their communities.

The second phase of the in-depth interviews was conducted with purposively selected experts (key informants) and leaders of local government agencies and departments such as MoFA, district weather stations, social welfare units and key farm and non-farm related NGOs. The interview guides for the institutional heads were slightly different from that of the FGDs, as they comprised of questions on policy and institutional roles in shaping livelihoods and migration decisions of households. A separate guide was prepared for each institutional head including NGOs, District and Municipal Directors of the Department of Agriculture, and Northern Development Authority. The common question that ran through the guides was, “in what ways are your programmes, initiatives and activities shaping livelihoods, adaptation and migration decisions of households in the district?” This question was always preceded by inquiry into the backgrounds and objectives of the institutions. Additionally, the guides also provided the avenue to probe into the challenges each institution encountered in providing supports to households. This gave the researcher the opportunity to solicit information on programs, policies and initiatives that are implemented to enhance livelihoods, adaptation practices, and migration decisions of households. The interview continued until a point of saturation was reached where no new information was obtained.

**Figure 3.4: Researcher interviewing the Assembly member of Kunzokala**



**Source: Fieldwork, 2022**

### **3.2.4 Data Analysis**

In analysing the quantitative data, the Statistical Product and Service Solutions (SPSS) version 20 was used as the major tool. Among the variables analysed using this software were background characteristics of respondents, main sources of livelihoods, experiences of households on climate and non-climate related hazards, impacts of climate and non-climate related hazards on livelihoods of households, reasons and main destinations of migrants, household receipt and uses of remittances and non-migration of some household members. More so, for purposes of comparison, the data were also disaggregated into districts and gender. The findings were presented in tables with few charts including bar graphs. Pertaining to the test of statistical significance of the study, the Chi-square ( $\chi^2$ ) test of association was employed. The Chi-square test was suitable for this study since most of the variables employed were nominal. Variables for which statistical differences were determined included sociodemographic characteristics of respondents, household experiences with climate and non-climate related

hazards by district and gender, seasonal or permanent migration by district and gender, receipt and uses of remittances, and reasons for non-migration by district and gender.

The qualitative data analysis was manually done through a thematic approach. Even though the use of software has been described as efficient and time saving (Braun & Clarke, 2006), I adopted the manual approach in this study to enhance my familiarisation of the transcribed data. The study drew on the six steps of thematic analysis by Braun and Clarke (2006) to deduce five steps to manually analyse the data. The data collected during the focus group discussions and the in-depth interviews were engaged through five stages or processes before producing a report, which formed part of the qualitative aspect of the study. The first stage entailed typing written field notes and manually transcribing audio recordings. Stage two involved copious reading for the purposes of familiarising with the data gathered. At the third stage, codes were assigned to the data based on the themes contained in the guides, which were also in conformity with the objectives of the study. Codes assigned to the data gathered from FGDs and IDIs (including KIIs) were the same. These codes included “climate hazards”, “non-climate hazards”, “livelihoods”, “impacts”, “migration”, “coping strategy”, “remittances”, “policies”, “assistance”. After coding, the data at the fourth stage were organised and arranged under the various themes generated. Lastly, a report was written based on the findings.

To ensure validity and reliability of the qualitative data, I employed the technique of member checking. According to Doyle (2007) and Mason (2002), member checking is the technique of returning an interview or analysed data to a participant to confirm and validate the result or the preliminary findings of the study. Doyle further noted that member checking can enhance the trustworthiness of qualitative data. Although member checking entails a number of activities (Tong et al., 2007), this study used the member check interview approach as championed by

Doyle (2007). After copiously reading through all the transcribed data, the researcher noticed that a couple of participants had provided some information that were novel and controversial for which clarification, verification and confirmation were needed for modification. These transcripts therefore foregrounded the second interview where new meaning could be constructed and previous interpretation validated. Prior to the interview, the researcher followed the process of re-consent and also returned the transcripts to these participants. This was to enhance their preparation for the discussion. Audio recordings from the second interview were transcribed and further analyses of the data were engaged. As a weakness of the approach, Mason (2002) noted that, the presence of the researcher might coerce the participants to forcefully accept the interpretation of the latter. This limitation was addressed as the researcher ensured that the interview was as cordial as possible where the participants freely expressed their concerns and effectively cooperated.

### **3.2.5 Ethical Considerations**

In every phase of a research process, one key issue that is of utmost importance is ethical consideration. It is expected of every researcher to take into account the participants' welfare and safety in the course of identifying the research problem, selecting research participants, data gathering, analysis of data and interpreting or writing and dissemination of research findings (Creswell, 2012). For this reason, the GCM project, in which this study is an integral part of, obtained the necessary ethical considerations and requirements from the Internal Review Board (IRB) of the University of Ghana, Legon, before the commencement of all field works. These include informed consent, confidentiality, anonymity, privacy, risks and benefits.

In applying confidentiality, anonymity and privacy in this study, it was optional for participants to give their names and addresses. Even instances where names and addresses were mentioned,

these were later replaced with pseudonyms after transcription. Participants were informed that all responses received would be used for the sole purpose of the study. Respondents were told that they had absolute right to decide whether to discontinue or participate in the research. However, the researcher explained to them that the success of this academic study was dependent on their responses. Respondents were further entreated to appreciate the fact that it's their prerogative right to decide which questions to answer, and that they were not under obligation to disclose information that are against their wish. In addition, respondents were assured that this study is far from deception even if they have ever had such experiences.

### **3.2.6 Field Experiences/Challenges/Limitations**

The study, which was one of its kind, was very educative, enlightening and awakening as the role of governance (national policies and local institutions) in shaping climate change and migration is under researched in the study areas. However, there were a few challenges that confronted the smooth conduct of the study. The first challenge was in connection with research fatigue. A section of the respondents and participants in Kunzokala and Siiru maintained that they were fed up with researchers coming in their numbers to conduct interviews on climate and migration issues in their communities without any help for them. In this regard, many of them were initially unwilling to participate in further interviews. Nonetheless, upon hearing a detailed explanation of the aim and objectives of the study, many of them started cooperating. As this study also focuses on strategies employed to deal with the impacts of climate change on livelihoods, it was expected that the participants mention the various institutions and the specific assistance they received from them. However, during FGDs and the In-depth interviews, most of the respondents were not able to list the names of these institutions and NGOs. This made it difficult for the researcher to reach out to the respective institutions. This issue was, however,

resolved when the researcher requested to see some of the projects and initiatives of NGOs and other development partners in the communities. It was then the researcher got the names and purpose of these institutions. This was helpful in the researcher's follow up interviews with key informants in these institutions.

Employing the services of research or field assistants who are also natives was very helpful and advantageous in several ways. First, the language which could have been a major challenge for the researcher was removed, as the field assistants could speak all the local languages and better understand all their cultural practices. In addition to this, the field assistants were themselves crop farmers as well as students, so they could easily relate with the topic and rendered a better explanation with the local language to the participants. It could be assumed that this had the propensity to shape the responses of participants and households, particularly instances where respondents were to criticise the activities of different institutions in the communities. The researcher, nonetheless, ensured that this incident never ensued as the researcher constantly moderated the questions field assistants asked the respondents.

The last challenge, which ran through all the communities of study, was the incessant demand for compensation and financial benefits on the part of respondents and recruiters from the researcher and the field assistants. This is much attributed to the high incidence of poverty in these rural communities (Awuse & Tandoh, 2016; Fielmua, 2017; GSS, 2021; Teye et al., 2021). The researcher again, patiently explained to them that the work is purely for academic purposes and the findings will be published, which can attract the attention of the government, development partners and NGOs to offer supports in the near future. In spite of this, the researcher distributed a piece of washing soap to each participants after the interviews.

Though making appointments with some leaders for interviews was somewhat frustrating due to their busy schedules, meeting with chiefs and women leader was smooth as they had ample time for us. Again, recruiting other participants was quite easy as the respondents were familiar with the focal leads engaged in the recruitment. In all, by dint of hard work and persistent, the FGDs and in-depth interviews were successfully conducted.

### **3.3 Positionality**

Positionality is a concept that reflects the position a researcher has chosen to adopt within a given study. It has also been explained by (Teye, 2012) as a concept founded on the notion that the researcher's characteristics in relation to the characteristics of the research participants can influence the data that are produced. The characteristics of the researcher that influence the outcome of data garnered differ from one researcher to the other. However, generally, either one or a combination of these background characteristics such as age, class, gender, level of education, nationality, and level of affluence of the researcher may influence the research study (Peach, 2002).

Explaining positionality in the context of mixed methods design requires that certain key concept "insider"- "outsider" perspectives is well understood for better application in a research. On 'insider-outsider' relation, the researcher's position as an outsider about nativity affected the data collected in both a negative and a positive manner. As argued by Mohammad (2001), 'outsider' researchers are more objective and are able to gain access to information without altering the meanings of these responses. This proposition played out well in the communities of study. Local farming households were more willing to trust the researcher with how government intervention pertaining to resource distribution has been characterised along political party lines. However, field assistants who are insiders were denied access to this information as respondents

were of the view that they might leak same details to the people that mattered in the community. To avoid this situation, the researcher conducted those interviews himself through the help of interpreters that were not from the community but could understand the local language. On the contrary, participants were not ready to disclose to ‘outsiders’ (the researcher) issues on their financial earnings, issues on land tenure and other private concerns. Trained field assistants who are insiders about nativity were engaged to conduct those FGDs and in-depth interviews.



## CHAPTER FOUR

### BACKGROUND CHARACTERISTICS OF RESPONDENTS,

### AND EXPERINCES OF CLIMATE CHANGE AND ITS IMPACTS ON LIVELIHOODS

#### 4.0 Introduction

This chapter entails the analysis of the primary data based on socio-demographic features of respondents, and experiences of climate change and its impacts on livelihoods of farming households. The first part of this chapter presents the background characteristics of respondents, which include age, gender, number of household members present, number of household members absent, education completed and migration status of respondents. The second section also presents discussions on the experiences of climate change and its impacts on livelihoods of farming households. This covers main sources of livelihoods, households' experiences with climate and non-climate related hazards, perceptions of changes of the hazards by households, and impacts of climate related hazards on livelihoods.

#### 4.1 Background Characteristics of Respondents

Table 4.1 shows the socio-demographic characteristics of respondents from the Wa West District and the Jirapa Municipality. To achieve the objectives of the study, a number of background characteristics of the respondents including age, gender, number of household members present, number of household members absent, duration of stay in the community, education completed and migration status were identified and used for the analysis.

Table 4.1 Socio-Demographic Characteristics of Respondents in the Wa West District and Jirapa Municipality

Demographic characteristics	Wa West N (%)	Jirapa N (%)	Overall N (%)
<b>Age</b>			
18-25	16 (10.7)	12 (8)	28(9.3)
26-35	32 (21.3)	28 (18.7)	60(20)
36-45	35 (23.3)	33 (22)	68(22.7)
46-60	44 (29.3)	51 (34)	95(31.7)
Above 60	23 (15.3)	26 (17.3)	49(16.3)
Total	150 (100)	150 (100)	300(100)
Chi-squared (4) = 1.5964 P = 0.809			
<b>Gender</b>			
Male	87 (58)	82 (54.7)	169(56.3)
Female	63 (42)	68 (45.3)	131(43.7)
Total	150(100)	150(100)	300(100)
Chi-squared (1) = 0.3388 P = 0.561			
<b>Education completed</b>			
No formal education	111 (74)	101(67.3)	212(70.7)
Primary	14 (9.3)	17 (11.3)	31(10.3)
Junior/Middle School (Class 8-10)	5 (3.3)	9 (6)	14(4.7)
Senior High School (Class 11-12)/A' level	16 (10.7)	14 (9.3)	30(10)
Vocational		3 (2)	3(1)
Tertiary	4 (2.7)	6 (4)	10(3.3)
Total	150 (100)	150 (100)	300(100)
Chi-squared (5) = 5.4382 P = 0.365			
<b>Number of HH members present</b>			
1-3 members	25 (16.7)	32 (21.3)	57(19)
4-6 members	58 (38.7)	59 (39.3)	117(39)
7-9 members	37 (24.7)	42 (28)	79(26.3)
10 or more	30 (20)	17 (11.3)	47(15.7)
Total	150 (100)	150 (100)	300(100)
Chi-squared (3) = 4.7804 P = 0.189			
<b>Number of HH members absent</b>			
None	42 (28)	30 (20)	72(24)
1-2	60 (40)	59 (39.3)	119(39.7)
3-4	32 (21.3)	42 (28)	74(24.7)
5 or more	16 (10.7)	19 (12.7)	35(11.7)
Total	150 (100)	150 (100)	300(100)
Chi-squared (3) = 3.6169 P = 0.306			
<b>Duration of stay in the community</b>			
All my life	78 (52)	75 (50)	153(51)
20 years or more	39 (26)	52 (34.7)	91(30.3)
10 to 19 years	19 (12.7)	12 (8)	31(10.3)
Less than 10 years	14 (9.3)	11 (7.3)	25(8.3)
Total	150 (100)	150 (100)	300(100)
Chi-squared (3) = 3.8566 P = 0.277			

<b>Migration Status</b>			
Native	126 (84)	138 (88)	258(86)
Migrant	24 (16)	18 (12)	42(14)
Chi-squared (1) = 0.9967 P = 0.318			

**Source: Fieldwork, 2020**

As illustrated in Table 4.1, a little over thirty percent of the respondents (31.7%) from the two major study areas were within the age of 46-60 years. The proportion of respondents who fell within this age category was higher in the Jirapa Municipality (34%) than in the Wa West District (29.3%). The lowest proportion of respondents (9.3%) from the two major study areas however, fell within the age group 18-25. The disparity in the districts reveals that Wa West had more respondents (10.7%) within this age category than respondents from the Jirapa (8%). The Chi-square test ( $p=0.809$ ) indicates a statistically insignificant association between age of respondents and households from both the Wa West District and the Jirapa Municipality. This implies that age of respondent has no link with their location in terms of administrative districts.

Concerning gender, the survey across the two districts indicated that majority of the respondents were males (56.3%) while the female respondents formed the minority (43.7%). The district level analysis also witnessed Wa West recording more male respondents (58%) than their counterparts from the Jirapa (54.7%). On the other hand, whilst the analysis witnessed Jirapa Municipality recording almost half of the female respondents (45.3%), Wa West District relatively had a lesser proportion of female respondents (42%). The analysis of the data also showed a statistically insignificant relationship ( $p=0.561$ ) between gender of respondents and their respective administrative districts.

On the educational backgrounds of the respondents, the overall analysis showed that greater proportion of respondents had no level of education in the two major study areas. However, this phenomenon is more prevalent in the Wa West District (74%) than the Jirapa Municipality

(67.3%). Across the main study areas, only 3.3% of the sampled respondents were identified as having completed tertiary education. Comparatively, more respondents in the Wa West District (3.3%) had attained tertiary level of education than their counterparts in the Jirapa Municipality (2.7%). Statistically, the association between education completed by respondents and districts is insignificant ( $p=0.365$ ). This implies that households' level of education is not influenced by their location. Given the role of education in poverty reduction, the study posits that the high illiteracy rate in the region has a bearing on the incidence of poverty (GSS, 2021).

During the quantitative survey, the findings indicated that nearly forty percent of the respondents (39%) had between 4-6 household members present. However, respondents in the Jirapa Municipality (39.3%) had a little more household members present during the survey than household members of respondents in the Wa West District (38.7%). The Chi-square test ( $p=0.189$ ) reveals the statistically insignificant relationship between the number of households members present and the districts of study. This points to the fact that the administrative districts of households have no influence on their mobility endeavours.

Similarly, a number of household members were not present at the time of data collection. As shown by the combined analysis, 39.7% of the sampled respondents in the two assemblies had between 1-2 household members absent. At the district level, it was revealed that Wa West and Jirapa had almost equal proportions of respondents who had between 1-2 members absent.

Analysis of the data on duration of stay of community members revealed that, on the whole, majority of the respondents (51%) had stayed in the communities within the two districts all their lives. However, whereas Wa West District had majority of its respondents (52%) having stayed within the communities all their lives, exactly half of the respondents in the Jirapa Municipality (50%) also had lived all their lives in the same communities. As evident from the Chi-square

result ( $p=0.277$ ), there is a statistically insignificant association between respondents' duration of stay and the administrative districts of the study. What this communicates is that the administrative districts are indifferent of how long people stay in the study communities.

Lastly, the study also sought to describe the migration status of respondents. Moreover, it was revealed from the overall analysis that whilst greater proportion of the respondents from both districts (86%) were natives, relatively small proportion of the respondents (14%) were migrants. The district level analysis showed that there were more native respondents in the Jirapa (88%) than there were in the Wa West (84%). On the contrary, Wa West (16%) had more migrant respondents than their counterparts in the Jirapa Municipality (12%). The analysis further highlights that location of household members has no bearing on their migration status, as shown by the Chi-square test ( $p=0.318$ ).

#### **4.2 Main sources of livelihood**

Given that this chapter seeks to examine the experiences of climate change and its impacts on livelihoods of households, it was pragmatic to examine the various livelihood sources available in the study areas. The major livelihood sources identified across the various study communities within the Wa West District and the Jirapa Municipality were crop farming, fishing, trade or commerce, civil service, business employment, skilled labour, remittances, smock weaving and charcoal production. The quantitative data, however, showed a significant difference between crop farming and other livelihood activities, hence for the sake of brevity, the activities were classified as crop farming, civil service, trading, skilled labour, remittances and others.

**Table 4.2: Main sources of livelihood**

Sources of livelihood	Wa West			Jirapa			Overall		
	Male	Female	All	Male	Female	All	Male	Female	All
	%	%	%	%	%	%	%	%	%
Crop farming	92.2	88.9	90.7	90.2	89.7	90	91.1	89.3	90.3
Trading/commerce	0.0	3.2	1.3	4.9	2.9	4	2.4	3.1	2.7
Civil Service	1.1	0	0.7	2.4	0	1.3	1.8	0	1
Skilled Labour	3.4	3.2	3.3	1.2	1.5	1.3	3.4	2.3	2.4
Remittances	1.1	3.2	2	0	1.5	0.7	0.6	2.3	1.3
Others	2.2	1.5	2	1.3	4.4	2.8	0.7	3	2.3
Totals	100	100	100	100	100	100	100	100	100
Chi-squared (8) = 8.6227 P= 0.375									

**Source: Fieldwork, 2020**

As shown in Table 4.2, the overall analysis of the survey data from both districts revealed that majority (90.3%) of the respondents engaged in crop farming as their main source of livelihood. The data further revealed that both males and females were heavily engaged in crop farming, although the proportion of males (91.1%) marginally exceeded the females (89.3%) by only 1.1 percent. The district level dynamics displayed limited disparity, as the proportion of respondents in Wa West (90.7%) who engaged in crop farming slightly exceeded their counterparts in Jirapa (90%). This disparity mirrors the gender differences where the proportion of male respondents who engaged in the said livelihood in the Wa West District (92.2%) was slightly higher than their counterparts in the Jirapa Municipality (90.2%). In contrast, the proportion of the female respondents in the Jirapa Municipality (89.7%) was higher than those in the Wa West District (88.9%), although with relatively small margin (0.8%). Statistically, the analysis of the data indicates that there is an insignificant association ( $p = 0.375$ ) between gender and crop farming in the study areas. This shows that crop farming is a common livelihood source for both male

and female household members in the study areas. Even though the survey from both districts showed that more women were into crop farming as the men, a nuanced analysis of the qualitative data indicated that majority of the women were supporting their husbands rather than engaging in independent farming. The views of a female participant in an in-depth interview confirmed this assertion:

*Both men and women are involved in farming, but I think men are more into farming because as a woman, you can only support your husband on his farm. Women do not own their own farmlands. It is when your husband dies that you and your children can have access to the plot of land he was farming (Female, 38 years, March, 2022, Kunzokala).*

As highlighted in the above quotation, the inability of women to own land is related to patriarchal norms where men are seen as the head of families and hence have authority over family lands. The access to family lands is their prerogative rights, as they determine who owns what (Abakisi, 2018). Concerning women's lack of right to own lands, respondents revealed that because women or wives are usually from different family, the fear is that, the death of their husbands could result in the transfer of the land into another family especially when the women remarry. This finding is in tandem with the supposition of Quisumbing and Pandolfelli (2010), that in a patrilineal system of inheritance, men are given preferential treatment over women concerning access and ownership of lands. This mirrors the relationship between structures and human agency; where constraining forces of societal structures delimit the agency from unleashing its full potentials to avert any vulnerability, in this case climate perturbations (Sibeon, 2004). This also resonates with the situation where access to livelihood assets is much determined by the function of the transforming structures (DFID, 2005); land tenure system spearheaded by patriarchal norms. In spite of the structural constraints, it is important to note that females play crucial role in ensuring food security. That is, given the food insecurity and famine

that often beset the people of the northern regions (Abakisi, 2018; Yaro, 2013), is crucial and more beneficial if women are permitted to farm alongside the men (Anaglo et al., 2014). This food insecurity is mostly attributed to climate change and other socioeconomic factors (Teye & Owusu, 2015). Notwithstanding, Anaglo et al. (2014), are of the view that poor access of women to land diminishes their capacity to engage in sustainable environmental management, consequently affecting agriculture and biodiversity on their farms. Similarly, Abakisi (2018), Apusiga (2009) and Hans et al. (2019), note that women's inability to access and control farmlands does not only hinder their productivity but also limit their contributions to the agricultural sector and the realisation of bigger socioeconomic development goals and food security. This phenomenon serves as a wake-up call on local government, chiefs and family heads to revisit the issue of land tenure system in the study areas.

A more nuanced analysis of male dominance in crop production is revealed in the qualitative findings. An opinion leader maintained that elderly men and a section of the youth mainly undertake farming. However, majority of the youth (both male and female) are engaged in other livelihood activities they perceive fetch quick money than farming. His views are captured below:

*Basically, it is the men who are involved. They are mainly elderly people and a section of the youth. But most of the youth are not interested in farming while galamsay is in the community. [...]. When you look at the extraction of shea butter, it is basically the women who do that for their survival. The collection of stones is done by the women and some elderly people who cannot farm every day. And also pottery, which is done by the women as well. As for the galamsay it is basically the youth – young guys and ladies are into galamsay. They think that is where there is quick money (Opinion leader, 35 Years, Male, March, 2022, Pinyiri).*

The informant explained that majority of the youth due to the economic hardships and effect of the changing climate on agrarian activities are not interested in farming but rather engage in

illegal mining popularly known as ‘galamsay’ which they perceive provides a quicker way of making money. He asserted that women are also engaged in activities such as shea butter extraction and stone gathering in addition to crop farming. These activities are undertaken as a means of diversifying livelihoods in the face of disruptive actions of climate change on crop farming. This view resonates with Ellis (2000) and Antwi-Agyei et al.’s (2021) assertions that in order to cope with and adapt to climate disturbances on crop production, farming households adopt a number of strategies in their pursuit of livelihood diversification. The phenomenon also reflects the influence of human agency on societal structures (Giddens, 1984); where irrespective of the impacts of climate and non-climate related structures on households’ livelihoods, farming households employ a number of strategies (agency) to deal with the effects.

Another important dynamics revealed by the survey data is the use of remittances as one of the main sources of livelihood. Overall, the survey showed that as low as 1.3% of the respondents from both study districts reported depending solely on migrant remittances as their main source of livelihood. The gendered pattern of this livelihood source indicated that more female respondents (2.3%) relied on remittances than male respondents (0.6%). At the district level, whilst 2% of the respondents in the Wa West District confirmed that remittances were one of their livelihood resources, only 0.7% of the respondents in the Jirapa Municipality indicated having relied on migrant remittances as a livelihood source. The gender disparity between the districts also showed that more female respondents in the Wa West District (3.2%) and the Jirapa Municipality (1.5%) used remittances as a source of livelihood than their male respondents in the Wa West (1.1%) and the Jirapa (0%). These findings are validated with the case of a 64-year old woman in Siriyiri, presented below in the following quotation.

*I am not able to do any hard work that earns me income. Even the current state of my health does not permit me to do anything. Thankfully, however, I have two daughters and a son in the south who mainly do menial jobs, and are able to send me money every weekend just enough to buy me food and medicine. So for me, remittances are my major livelihood source (Female, 64 years, Siriyiri, March, 2022).*

As revealed in the case above, migrant remittances serve as a means of sustenance to the left-behind particularly the elderly. However, the relatively small proportion of households that relied on migrant remittances as one of their main sources of livelihood, offers the opportunity to interrogate the long held assertion that people adopt migration as a coping strategy to the adverse effects of climate change and variability (Jarawura & Smit, 2015; Musah-Surugu et al., 2018; Van der Geest, 2011; Vinke et al., 2020). Although several factors may account for some household members solely dependening on migrant remittances (Banerjee et al., 2017; Teye et al., 2023), the case under discussion alludes to demographic factors and health status of recipients. More so, the narration further supports the conceptual framework of the study where migration and migrant remittances are considered livelihood assets (Carney et al., 1999).

#### **4.3 Experiences of Households with Climate-related Hazards**

As a global phenomenon, the effects of climate change are experienced by individuals and households. In addition, major sectors such as agriculture, health, infrastructure and energy of an economy are diversely affected. Various researchers have defined climate hazards differently. This study adopted the definition of the Intergovernmental Panel on Climate Change (IPCC), given here as “the potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources” (IPCC, 2018, p. 27). According to Shekhtman (2019), peoples’ experiences of climate change and variability are built around intense drought, floods, rising sea levels, irregular rainfall and

extreme temperatures, catastrophic storms and declining biodiversity. In the study areas, households' experiences with climate hazards were focused on drought, floods, extreme temperatures (high and or cold) and irregular rain (insufficient or too heavy). Respondents were asked to indicate if they had experienced the hazards within the last five years. Their responses are summarized in Table 4.3 below.

**Table 4.3: Proportion of households experiencing climate-related hazards within the last five years**

Hazards	District		Total
	Wa West	Jirapa	
	N = 150	N = 150	N = 300
	%	%	%
<b>Drought</b>			
Yes	100	96	98
No	0	4	2
Total	100	100	100
Chi-square (1) = 6.1224 P = 0.013			
<b>Floods</b>			
Yes	6.7	1.3	4
No	93.3	98.7	96
Total	100	100	100
Chi-square (1) = 5.5556 P = 0.018			
<b>Rains –irregular (insufficient or too heavy)</b>			
Yes	100	98.7	99.3
No	0	1.3	0.7
Total	100	100	100
Chi-square (1) = 2.0134 P = 0.156			
<b>Extreme temperature (high and or cold)</b>			
Yes	80.7	97.3	89
No	19.3	2.7	11
Total	100	100	100
Chi-square (1) = 21.2802 P = 0.000			

**Source: Fieldwork, 2020**

As shown in Table 4.3, irregular rains were the most dominant hazard reported by 99.3% of the total respondents from both study areas. However, the data disclosed that more respondents in the Wa West District (100%) experienced this particular hazard than those in the Jirapa Municipality (98.7%). The Chi-square test ( $p=0.156$ ) shows that this difference is statistically

insignificant. The insignificant difference between the proportions that reported this hazard across the districts implies that the phenomenon is a major problem. During a focus group discussion, a participant shared their experiences with the fluctuating rainfall patterns:

*Yes, we normally experience high rainfall in September, but last year we experienced it in August. We detect that using our dam. Usually in September, the dam rises to its peak to the extent that you can't cross it, but last year it happened in August instead of September. By September, there was no water again. Last year, it rained in August and March, so from October to November there was no rain. The rain we had last year, 2021 was on 24th November, and that was the rain that helped farmers to mount their yam mounds. If not, they wouldn't have been able to raise the yam mounds. You cannot experience normal rainfall throughout the farming season like the olden days. I know as it has started raining early this year it would definitely stop early (Male Focus Group Discussant, March, 2022, Siiru).*

According to the participants, it is difficult to experience normal rainfall throughout the farming season unlike previously. This finding is consistent with all current scientific analysis of rainfall data in the northern part of the country (GSS, 2020; Teye et al., 2021). It was learnt that households now experienced highest rainfall in August instead of September. He stated further that though this is unusual, farmers have started adjusting to the fluctuation in rainfall by changing planting dates. For instance, yam farmers used the period to mount their mounds for yam cultivation. The participant also suggests that despite the erratic nature of the rain, farmers through their experiences are able to tell when the rains and drought will start and stop. This shows that though climate variability may affect agricultural livelihoods, farmers can also adopt a number of livelihood strategies to deal with these vulnerabilities (Carney et al., 1999; Holt-Jensen, 1999).

The next most important climatic hazard reported by 98% of the respondents from the major study areas is drought. When differentiated by districts, the result showed that whilst all the sampled respondents in the Wa West District (100%) confirmed having experienced this hazard,

a little less than the entire proportion of the respondents in the Jirapa Municipality (96%) experienced it. This difference is confirmed by the Chi-square analysis, which showed a statistically significant relationship between households in the districts and drought. This implies that there is a significant relationship between households that experienced drought in the Wa West District and the Jirapa Municipality. Even though findings from the qualitative study corroborated the result from the survey, participants revealed that their experiences with the hazard have been mild lately relative to worse cases recorded over the years. Sharing her experience with the hazard, a middle-aged woman reported that:

*The drought comes and goes. There are years that drought will occur and in other years it will not occur. For instance, the drought was not that bad in the just ended farming season. The drought occurred for a short period of time and then it started raining heavily (Female, 52 years, March, 2022, Siriyiri).*

In a similar account, a respondent in the Jirapa Municipality noted that the area currently does not experience severe drought, what is mostly experienced are rather dry spells, and that even if drought occurs it only lasts for a short time. A female participant in one of the study communities made this clarification in an in-depth interview presented as: *I'm not sure if drought occurs. What mostly occurs here is dry spells. Even if drought occurs, it is only for a short term (Female, 38 years, March, 2022, Kunzokala).*

The above data suggest a declining trend of drought. However, given that literature has portrayed drought as the major climate hazard that disrupts agriculture livelihoods of rural peasant farmers (Derbile et al., 2022; Fielmua, 2017; Teye et al., 2021), it is surprising that food insecurity and hunger, consequently compelling people to migrate (Awuse & Tandoh, 2016; Sam et al., 2020), are not only persisting but also gaining ascendancy (GSS, 2021). This may be attributed to a plethora of factors including poor governance systems. It should, nonetheless, be stated that the

incidences of droughts or dry spells in the study areas have more to do with meteorological and hydrological triggers (Botai et al., 2016), as evidenced by irregularities associated with the rains. To affirm this, Breinl et al. (2020) have maintained that the severity and the period of droughts are explicitly related to the number of days of less rainfall or precipitation.

To measure the participants' level of knowledge and understanding of the climate related hazards, a discussion was held around the possible causes of the hazards. This was to help in the choice of appropriate adaptation strategies and implementation of the right policy interventions. A point that resonates with Wilkinson et al.'s (2016), assertion that, policy intervention should begin at the local and community levels, since community knowledge and participation are key to ensuring the success of such interventions. The participants revealed that climate change and its associated hazards are driven by both acts of God and human activities. Even though they could not describe what the natural causes entailed, they admitted that their activities such as cutting down of trees for firewood and charcoal production and bush burning were partly contributing to the changes in climate. A female participant in an in-depth interview shed light on this phenomenon:

*The cause I will attribute to tree felling. Now this place is almost like a desert. Few trees. Those days, before you can see the next house then you have to walk a certain distance. But now if you just look you will see all the houses around. We've cleared all the trees here, sometimes for building, sometimes for fuel wood, charcoal and the bush burning too. Right after farming, immediately the harmattan sets in they start burning the bushes to trap these rats and other bush animals (Female, 38 years, March, 2022, Siryiri).*

These activities, according to IPCC's claim, can play intermediary roles in changing the world's climate particularly the local environment and the microclimate (IPCC, 2019). However, the indiscriminate cutting down of trees for charcoal making is also considered a form of livelihood for many as crop farming is adversely hampered by climate change and variability (Aniah,

2016). This therefore presents a difficult task for the government and traditional leaders in controlling the act of tree felling. As it emerged in the conceptual framework of this study, whilst the vulnerability context results in the adoption of appropriate strategies, the strategies employed to deal with the vulnerabilities themselves can further exacerbate the existing vulnerabilities (DFID, 2005).

Finally, the data showed that floods were the least dominant climate related hazard experienced by only 4% of the respondents in all the communities studied. However, the hazard was more experienced in the Wa West District (6.7%) than in the Jirapa Municipality (1.3%). The difference between the proportion of respondents from the two districts that experienced floods is statistically significant, as shown by the result of the Chi-square analysis ( $p=0.018$ ). Responses from farmers during focus group discussions revealed that relatively, floods had very limited impacts on their activities, as the hazard is not a common occurrence in their communities. A male discussant reported that:

*In our community, we have never experienced flood. It only happens if you farm in low land area, especially those who farm yam in a low land area. Sometimes when it rains heavily like what we experienced yesterday, it can wash away the yam mounds. Apart from that, those who farm along riverbanks. Some are doing dry season farming so by now, their maize has grown up to 3 months, so when it rains heavy it will definitely wash everything away (Male Focus Group Discussant, March, 2022, Pinyiri).*

According to the discussant, the floods only come along with heavy rains, and are experienced mostly by those residing and farming in low-lying areas. This revelation supports the assertion of Teye et al. (2020), that farmers who due to long periods of drought move closer to riverbeds and do not only plant along river banks but also inside the rivers, may have their crops washed away with the onset of sudden and heavy rainfall.

#### 4.4 Experiences of households with non-climate related hazards

Literature has shown that household vulnerability does not only result from the activities of climate related hazards but also from a combination of non-climate related hazards (Antwi-Agyei et al., 2017; Baffour-Atta, 2021; Derbile et al., 2022). These non-climate related hazards among other things include crop pest/diseases, decreasing soil fertility, problems with input purchase, and problems with output sales. The rest are livestock diseases, lack of drinking water, illness affecting households, high food prices, lack of employment, problems with access to farming lands, problems with access to forestry and non-timber forest product, conflict over land (land grabbing), conflict over service provision, and lack of government support to help deal with household problems. Respondents were expected to answer “yes” or “no” to the question: “have you experienced these hazards within the last five years”? Table 4.4 displays the responses of respondents in the survey.

**Table 4.4: Proportion of households experiencing non-climate related hazards within the last five years**

Hazards	District		Total
	Wa West	Jirapa	
	N = 150	N = 150	N = 300
	%	%	%
<b>Crop pests/diseases</b>			
Yes	95.3	98.7	97
No	4.7	1.7	3
Total	100	100	100
Chi-square (1) = 2.8637 P = 0.091*			
<b>Decreasing soil fertility</b>			
Yes	99.3	98	98.7
No	0.7	2	1.3
Total	100	100	100
Chi-square (1) = 1.0135 P = 0.314			
<b>Problem with input purchase</b>			
Yes	96	85.3	90.7
No	4	14.7	9.3
Total	100	100	100
Chi-square (1) = 10.0840 P = 0.001***			
<b>Problem with output sales</b>			

Yes	63.3	52.7	58
No	36.7	47.3	42
Total	100	100	100
Chi-square (1) = 3.5030 P = 0.061*			
<b>Livestock diseases</b>			
Yes	96	86.7	91.3
No	4	13.3	8.7
Total	100	100	100
Chi-square (1) = 8.2538 P = 0.004***			
<b>Lack of drinking water</b>			
Yes	72.7	72	72.3
No	27.3	28	27.7
Total	100	100	100
Chi-square (1) = 0.0167 P = 0.887			
<b>Illness affecting households</b>			
Yes	37.3	46.7	42
No	62.7	53.3	58
Total	100	100	100
Chi-square (1) = 2.6820 P = 0.101			
<b>High food prices</b>			
Yes	88	78.7	83.3
No	12	21.3	16.7
Total	100	100	100
Chi-square (1) = 4.7040 P = 0.030*			
<b>Lack of employment</b>			
Yes	94.7	92	93.3
No	5.3	8	6.7
Total	100	100	100
Chi-square (1) = 0.8571 P = 0.355			
<b>Problem with access to farming land</b>			
Yes	11.7	28	19.7
No	86.7	72	80.3
Total	100	100	100
Chi-square (1) = 13.1866 P = 0.000***			
<b>Problem with access to F N F P</b>			
Yes	37.3	38.7	38
No	62.7	61.3	62
Total	100	100	100
Chi-square (1) = 0.0566 P = 0.812			
<b>Conflict over land-land grabbing</b>			
Yes	9.3	12	10.7
No	90.7	88	89.3
Total	100	100	100
Chi-square (1) = 0.5597 P = 0.454			
<b>Conflict over service provision</b>			
Yes	58	44.7	51.3
No	42	55.3	48.7
Total	100	100	100

Chi-square (1) = 5.3371 P = 0.021			
<b>Lack of government support to help with HH problems</b>			
Yes	94.7	94.7	94.7
No	5.3	5.3	5.3
Total	100	100	100
Chi-square (1) = 0.0000 P = 1.000			

**Source: Fieldwork, 2020**

The survey data, as illustrated in Table 4.4 above, indicated that the most dominant non-climate related hazard reported by 98.7% of the respondents in the study areas was decreasing soil fertility. The analysis at the district level showed that higher proportions of the respondents from both Wa West (99.3%) and the Jirapa (98%) reported the incidence of declining soil fertility. The Chi-square analysis ( $p=0.314$ ) highlights the statistically insignificant difference between the proportion of respondents who reported the incidence. This implies that decreasing soil fertility is a major issue of concern for all farming households across the study communities. During the qualitative study, farmers reported that their farmlands are increasingly becoming infertile even though a vast and accessible arable land exists. The following statement captures the views of a farmer about the phenomenon:

*With respect to farming, the land has become infertile. Ever since I grew up here, the land that my late father used to farm on, is the same land that my brothers are farming on. There is vast land available anyway but it is not fertile. You will do the farming acres upon acres but the produce at the end of the day will be nothing to write home about (Opinion leader, Male, 42 Years, March, 2022, Siriyiri).*

As a major non-climate hazard experienced by households in the study areas, participants in the interviews further identified a range of possible causes of poor soil fertility. It was, however, learned that a number of these causes were linked to climate-related hazards such as drought and insufficient or heavy rainfall. According to the informants, prolonged drought causes the grasses to wither thereby exposing the land surfaces. The occurrence of heavy rains, therefore, trigger

soil erosion and consequently washes away the fertile top soil. This can potentially deplete soil nutrients (Scheiterle, 2019). Derbile et al. (2022) and Kebede (2019), established a direct relationship between climate hazards such as irregular rains or drought and decreasing soil fertility, indicating that as the incidence of irregular rains multiplies, soil infertility aggravates. This is similar to the findings of Mabe et al. (2012), where severe droughts in the northern regions of Ghana have degenerated into extreme temperatures, limited soil water absorption capacity, low soil fertility and poor crop yields. A chief farmer in an interview highlighted possible causes of declining soil fertility in the study communities. He mentioned among other things, factors such as over-cultivation of farmland, effects of droughts, overgrazing of grassland, hunting, cutting down of trees for firewood and charcoal production, and bush burning. He said that:

*I think there are other factors that contribute to the low land fertility. Apart from the continuous farming on the piece of land, drought too is part of the reason and sometimes over grazing. We have Fulani with their cattle moving in and out. Sometimes they over graze on a particular portion of land thereby reducing its fertility. And most at times too, the burning of the bush. The people here don't burn the bush and engage in hunting as I used to see but as I speak, people from Wa come for hunting in these areas. Sometimes they load themselves in cars, come and park and move into the bushes in search for bush meat and I think the continuous burning of the bush has an effect. The women too sometimes do charcoal burning. Though it is not rampant in this community because we are against the cutting down of trees but occasionally you see people doing it. What you also need to know is that, sometimes for someone to clear the land for farming, normally he cuts the trees including all shrubs growing up in the name of farming and I think all those things account for the land degradation and it doesn't help in crop production (Male, 42 years, March, 2022, Siiru).*

As participants revealed, land degradation stemming from both natural and human activities is a major contributor to decreasing soil fertility in the study areas. A relationship can be drawn between this finding and that of Abebaw's (2019) in Ethiopia. The author found that several factors such as improper land tillage activities, over-dependence on fuel wood, shrubs, dung and

mulch for household energy supply, improper management of grasslands especially excessive grazing of pasture proximate to farming communities, poor soil and water conservation practices, and poor construction and maintenance of irrigation facilities have immensely resulted in severe land degradation (Abewa, 2019). This moreover reveals the important relationship (interaction) between existing livelihood assets and livelihood strategies and the resultant effects on livelihood outcomes as posited by Carney et al. (1999), illustrated in the conceptual framework of the study.

In further discussions, study participants were asked to indicate how they managed decreasing soil fertility as this had direct effect on crop yields. Many of them referred to the use of soil amendments such as organic and inorganic fertilisers to boost crop production on their farms. For instance, farmers in Kenya believed that soil fertility can be enhanced with animal manure, domestic organic waste, fertiliser and plant residue (Yageta et al., 2022). Meanwhile, majority of the farmers expressed concerns with scarcity and high cost of fertilisers. The participants reported that despite these challenges, little to no government intervention has been received.

One of the participants indicated that:

*We have a problem in this community. Everybody including the government is aware that our farmlands are increasingly becoming infertile. And that we cannot farm without using fertilisers. But the government is not making the product cheap and easily accessible to farmers. For instance, a bag of fertilizer goes for Ghs500, how many bags can you afford on your farm? As for the tractor, you can not even find one in this community unless you travel to Wa, where the owners are. Farming is becoming too expensive these days ... (Female, 45 years, March, 2022, Kunzokala).*

This account suggests the frustrations farmers encounter in their bid to deal with infertility of farmlands amidst governance failures. As ploughing with tractors in particular enables farmers to cultivate large parcels of land, which possibly results in higher agriculture output (Kakahy et al., 2021); its mode of acquisition by farmers must be of paramount importance to the government. This is because farmers are likely to miss the planting/sowing season once they cannot access the

services of tractors on time. The input challenge with its attendant poor crop yields may intensify the existing socioeconomic vulnerability of households (Aniah et al., 2016; Antwi-Agyei et al., 2021; Yaro et al., 2016). This situation resonates with the conceptual framework, where households' vulnerability can be enhanced or exacerbated by the function of existing transforming structures and processes (Carney et al., 1999; DFID, 2005). It is, therefore, imperative to examine the role of national policies (FSP) and local institutions in assisting households' adaptation to the changing climate and its impacts through service and support provision.

It could be observed from the quantitative survey that conflict over land or land grabbing is the least dominant hazard as only 10.7% of the respondents in the entire study areas claimed. The distribution at the district level also indicated that the proportion of respondents that were affected by this hazard in the Jirapa Municipality (12%) was more than their counterparts in the Wa West District (9.3%). The result of the chi-square analysis ( $p=0.454$ ) showed that the difference between the proportion of respondents who were affected by the hazard in the study areas were statistically insignificant. This insignificant difference between the proportions who reported the incident signifies that conflict over land or land grabbing is not a major problem for households in the two districts. The smaller proportions of the respondents who experienced conflict over land could be attributed to the land tenure system practiced in the study areas, the traditional or customary where family heads own and control lands and bequeath same to male children (Songsore & Denkabe (1995 cited in Abakisi, 2018). The land tenure system is believed to be associated with minimal conflicts (Aasoglenang et al., 2013; Abakisi, 2018). During an in-depth interview, a chief revealed that aside from little misunderstanding that siblings may have over land bequeathed to them, conflict over land hardly occurs:

*You know in every society these things do happen but over here we hardly experience that but once a while you will see two brothers quarrelling over a piece of land left for them by their late father* (**Opinion leader, 46 Years, Male, March, 2022, Pinyiri**).

The importance of land in climate change adaptation in agrarian communities coupled with the role of patriarchal norms in minimising conflicts over land affirm the ability of societal structures in enhancing human agency as claimed by Sibeon (2004). Juxtaposing the minimal level of conflict over land with the greater percentage of respondents engaged in crop farming, one would expect an increase in agriculture productivity, thus, reducing food insecurity and hunger in the study areas and for that matter the region. However, literature has shown that crop production has taken a dwindling turn (GSS, 2021; MoFA, 2021), a phenomenon that offers the opportunity to examine the extent to which climate and non-climate related hazards and governmental role shape livelihoods of farming households in the study areas.

#### **4.5 Perceptions of households about changes in climate and non-climate related hazards**

The perception of individuals and households on the changes in climate and non-climate related hazards is crucial in devising positive and long lasting adaptation strategies (Cobbina & Anane, 2016). According to Sam et al. (2020), local people's perceptions about climate change and variability are mostly informed by their observations, expectation and experiences with the various climatic variables that affect lives and livelihoods. In this study, respondents were asked questions about the different climate and non-climate related hazards and the changes perceived with the hazards within the last five years. Respondents were entreated to indicate whether the effects of the hazards were increasing, decreasing, remained the same or they had no idea (do not know) at all. Table 4.5 below illustrates the responses of the respondents.

**Table 4.5: Perceptions of households about changes in climate and non-climate related hazards within the last five years (percentages)**

Hazards	Wa West					Jirapa					Overall				
	Increasing	Decreasing	Same	Don't Know	Total	Increasing	Decreasing	Same	Don't Know	Total	Increasing	Decreasing	Same	Don't Know	Total
Drought	77	23	0	0	100	70	26.7	3.3	0	100	73.3	25	1.7	0	100
Floods	2	90	8	0	100	0	56.7	42.6	0.7	100	1	73.3	25.3	0.4	100
Rains Irregular	82	18	0	0	100	76.7	18.7	4.6	0	100	79.3	18.3	2.3	0.4	100
Extreme temperature	53	44.7	2.3	0	100	72	22	6	0	100	62.7	33.3	4	0	100
Crop pests/diseases	73	27	0	0	100	73.3	26	0.7	0	100	73	26.7	0.3	0	100
Decreasing soil fertility	81	18.7	0.3	0	100	82	17.3	0.7	0	100	81.3	18	0.7	0	100
Problems with input sales	63	36.3	0.7	0	100	55.3	39.3	5.4	0	100	59	38	3	0	100
Problems with output sales	45	53	2	0	100	35.2	49.3	10	5.3	100	40	51.3	6	2.7	100
Livestock diseases	73	26.7	0	0.3	100	65.3	28.7	3.3	2.7	100	69	27.7	1.7	1.6	100
Lack of drinking water	27	53.7	20.3	0	100	46	29.3	24	0.7	100	36.4	41	22.3	0.3	100
Illness affecting households	12	86.7	1.3	0	100	21.3	64.7	13.3	0.7	100	16.7	75.7	7.3	0.3	100
High food prices	67	31	2	0	100	56	28	15.3	0.7	100	61.3	29.7	8.7	0.3	100
Lack of employment	67	32.3	0.7	0	100	63.3	34.7	1.3	0.7	100	65	33.7	1	0.3	100
Problem with access to farming land	10	87.3	2.7	0	100	22	56.7	20	1.3	100	16	72	11.3	0.7	100
Problem with access to FNTFP	37	60.3	2.7	0	100	31.3	48.7	18	2	100	34	54.7	10.3	1	100
Conflict over land	0.7	95.3	4	0	100	5.3	70.7	18.7	5.3	100	3	83	11.3	2.7	100
Conflict over service provision	12	64	24	0	100	22.7	52.6	20.7	4	100	17.3	58.3	22.3	2.1	100
Lack of government support to help with household problems	65	34.7	0	0.3	100	62.7	34.6	2	0.7	100	64	34.7	1	0.3	100

Source: Fieldwork, 2020

Overall, the survey data indicated that farmers mainly perceived the hazards as either increasing or decreasing. Whilst higher proportions perceived that hazards such as decreasing soil fertility, irregular rains and drought were increasing, conflict over lands, floods, problems with access to farming lands, and illness affecting households were equally perceived by greater proportions as declining. However, declining soil fertility was largely perceived by the highest proportion of the respondents (81.3%) from the study assemblies as increasing. The proportion of respondents that perceived rising incidence of the hazard in the Jirapa Municipality (82%) was 1 percent more than the proportion in the Wa West District (81%) that perceived same. On the other hand, nearly a fifth of the respondents (18%) perceived a declining trend of the hazard in the major study areas. The distribution across the districts showed that relatively lower proportions of the respondents in the Wa West District (18.7%) and the Jirapa Municipality (17.3%) witnessed a declining effect of the hazard. The difference between the proportions that perceived increasing trend of the hazard and those that perceived a declining trend of the same is indicative of the widespread impact of the hazard in the study areas. During in-depth interviews, participants were asked if they had noticed any changes in the fertility of the soil. Some farmers reported that over the past five years, they had witnessed a drastic change in the fertility of the soil. This has resulted in excessive use of fertilisers particularly the inorganic; a phenomenon their ancestors did not use yet had enough crop yield. A respondent in explaining this stated that:

*There are a lot of changes because our fathers were not using fertilizer to farm yet they got high yields. What is now weakening our environment is the excessive use of chemical fertiliser by all farmers. The environment is now used to this kind of fertilizer yet people don't have the money to buy them ... (Male, 33 Years, March, 2022, Pinyiri).*

The respondent however, explained that declining soil fertility partly caused by continuous use of chemical fertilisers on farmlands. This account is in tandem with Asmamaw's et al.'s (2022) assertion that continuous application of chemical fertiliser destroys important soil minerals and

nutrients, which are naturally located in fertile soil. According to Shashena et al. (2021), even though chemical fertilisers boost crop production, their perpetual use does not replenish soil fertility and nutrients; instead, increases quantities of nitrogen, potassium and phosphorous which adversely affect the soil. For instance, while the overuse of phosphorous results in hardening of soil, sodium nitrate also reduces the fertility of the soil thereby rendering it barren (Bawaje et al., 2020). More so, the respondents perceived that over-cultivation of the same farmland for a long period also accounted for the incidence of soil fertility:

*[...] In addition to that, there is something too like the continuous growing of a particular crop on a specific piece of land for a long time. It can also bring about the reduction in the soil fertility. The best way is to practice crop rotation but a lot of us do not do that. All these are contributory factors ((Male, 33 Years, March, 2022, Pinyiri).*

Although crop rotation as suggested by the respondent as a strategy to deal with soil infertility is laudable, it should be noted that one of the reasons for overly cultivating the same plot of land could be the meagre size of farmland bequeathed to male children by their fathers (Songsore, 2009). Given the repercussions of this phenomenon on crop production, it is crucial that NGOs and the government intensify intervention programmes for better adaptation and mitigation purposes. This sheds light on the critical role transforming structures and processes play in the access of natural assets and the application of appropriate livelihood strategies that may yield a positive and a negative livelihood outcome (DFID, 2005).

The second most important hazard perceived by a higher proportion of the respondents (79.3%) from the entire study areas as increasing was irregular rains. When differentiated by districts, the incidence of rising rainfall irregularities were reported by greater proportion (82%) in the Wa West District than their counterparts in the Jirapa Municipality (76.7%). Contrary to this, less than a fifth of the respondents (18.3%) across the two assemblies perceived that irregularity

associated with the rain was decreasing. The district level disparity revealed that almost the same proportion of respondents reported the declining trend of irregular rain in the Wa West District (18%) and the Jirapa Municipality (18.7%). Fluctuations in rainfall such as insufficient rains, too heavy rains, early and late onset of rains were considered serious hazards as relatively lower proportion of respondents noticed a dwindling trend of the phenomenon. Similar account of rain irregularities was reported by farmers during in-depth interviews:

*It was just last year that the amount of rainfall was that high. Since my birth I have never witnessed raining season with such high amount of rainfall. At that time, the rain used to start in the third month and continued until the sixth month. In the seventh month, the rains will stop for a very short period of time and start raining again ....*  
**(Male, 40 Years, March, 2022, Pinyiri).**

This quotation suggests incidences of erratic rainfall, cessation, onset and incidence of dry spells. According to Baffour-Atta et al. (2021), these variations in rainfall have implications for food security, income levels, poverty and outmigration, as specific food crops such as groundnut, maize, millet, rice and sorghum are adversely hampered.

As indicated earlier, a significant majority of the respondents (83%) from both districts perceived that over the past five years conflict over land was declining. As demonstrated by the district level analysis, greater proportion of the respondents in the Wa West District (95.3%) than the Jirapa Municipality (70.7%) perceived that the hazard was declining. However, only 3% of the respondents in the entire study areas claimed that there was an upsurge in conflict over land. Similarly, while less than one percent of the respondents in the Wa West District (0.7%) observed a rising incidence of the hazard, the same phenomenon was reported by a little over five percent of the respondents in the Jirapa Municipality (5.3%). These findings, which suggest minimal conflict over land, however, do not support existing literature. For instance, studies have shown that there are a number of unrectified land related conflicts in various settlements in the

Upper West region (AgNRM, 2017; Nkegbe et al., 2017; Sabogu et al., 2020). The frequently experienced land conflicts in the area, especially in the Wa West District, include land boundary conflicts between families/clans or communities, boundary conflicts between close land users, conflict over inheritance of farmlands, conflict between Fulani herdsmen and crop farmers and discrimination against women and settlers (AgNRM, 2017; Bebelleh, 2008; Sabogu et al., 2020). According to Nkegbe et al. (2017), these aforementioned conflicts have adversely hampered households' food productivity and levels of income. This phenomenon reflects the current situation in the study areas where food insecurity, poverty and outmigration are daily experiences of community members. Marfo et al. (2019) attribute these socioeconomic challenges to conflict over land.

#### **4.6 Impacts of climate and non-climate related hazards on livelihoods of households**

Mainly, the experiences and knowledge of households about climate change stem from its impacts on their livelihoods (see Codjoe & Atiglo, 2020; Teye & Owusu, 2015). As suggested in the literature, climate hazards such as drought, extreme temperature, irregular rains and floods trigger other non-climate related hazards including but not limited to declining soil fertility (Kebede, 2019; Scheiterle, 2019). In this study, respondents recounted the extent to which climate and non-climate hazards affected their sources of livelihood such as crop farming, animal husbandry, fishing, trading/commerce, civil service, remittances, and others. These livelihood sources were categorised into crop farming and others, as the aggregated proportions of households, which engaged in these other livelihood sources are marginal and may not show any statistical significance. Respondents were asked to identify which hazards mostly affected their livelihoods. Impact was measured on a 5- scale level, with 1 and 2 coded as 'no problem or no

negative impact’ while 3, 4 and 5 coded as ‘problem or severe impact’. The proportions in the table are those who chose 3, 4 and 5 on the 5 scale questions

**Table 4.6: Impacts of climate and non-climate related hazards on livelihoods of households**

Hazards	Wa West		Jirapa		Overall	
	Crop farming	Other livelihood sources	Crop farming	Other livelihood sources	Crop farming	Other livelihood sources
	N=136 %	N=14 %	N=135 %	N=15 %	N=271 %	N=29 %
Drought	100	100	91.1	86.7	95.6	93.1
Floods	4.4	7.1	1.5	0.0	3	3.4
Rains irregular	100	100	95.6	80	97.8	89.7
Extreme temperatures	80.9	78.6	92.6	73.3	86.7	75.9
Crop pests/diseases	94.1	85.7	95.6	100	94.8	93.1
Decreasing soil fertility	98.5	92.9	97.8	100	98.2	96.6
Problems with input purchase	87.5	64.3	75.6	73.3	81.6	69
Problems with output sale	59.6	28.6	52.6	33.3	56.1	31
Livestock diseases	91.2	92.9	82.2	80	86.7	86.2
Lack of drinking water	56.6	71.4	63.7	73.3	80.4	79.3
Illness affecting household	22.8	14.3	35.6	20	29.2	17.2
High food prices	87.5	85.7	73.3	73.3	80.3	79.3
Lack of employment	92.6	64.3	89.6	80	91.1	72.4
Problem with access to farming lands	8.1	14.3	23.7	33.3	15.9	24.1
Problem with access to FNTFP	33.8	42.9	39.3	13.3	36.5	27.6
Conflict over land	2.9	21.4	8.1	0	5.5	10.3
Conflict over service provision	35.3	35.7	39.3	20	37.3	27.6
Lack of government support to help with HH problems	96.3	78.6	93.3	93.3	94.8	86.2

**Source: Fieldwork, 2020.**

The overall analysis of the data revealed that crop farming is adversely hampered by four major hazards such as decreasing soil fertility, irregular rains, drought, and crop pests/diseases. Among these, the highest proportion of the respondents (98.2%) were of the view that decreasing soil fertility was severely affecting crop farming. In a similar manner, greater proportions of the respondents from both the Wa West District (98.5%) and Jirapa Municipality (97.5%) respectively affirmed the adverse impacts of the hazard on crop farming, the mainstay of most rural folks. The higher proportions that reported the hazard is indicative of its negative and widespread impact on food crop production. Additionally, the increasing trend of soil infertility may implicitly be linked with the intensifying impacts of climate hazards such as irregular rains, drought and floods (Aniah et al., 2016; Antwi-Agyei et al., 2021; Derbile et al., 2022). In expressing his views about the dangers of declining soil fertility, an opinion leader, during the qualitative study revealed that:

*... There is vast land available anyway but it is not fertile. You will do the farming acres upon acres but the produce at the end of the day will be nothing to write home about. So the major challenge is the infertility of the land. Many farmers now are not happy because harvest is very poor (Opinion leader, Male, 42 Years, March, 2022, Siriyiri).*

The response shows that there is a positive relationship between soil fertility and crop yield thus, as the fertility of the soil declines crop yield also reduces. According to Leon-Moreno et al. (2019), soil fertility is the capacity of the soil to sustain plant growth by producing the required nutrients. However, the soils in the study districts are losing the capacity to produce the needed nutrients to sustain the growth of crops. Notwithstanding, Baffour-Atta et al. (2021) have indicated that crops such as groundnut, maize, millet, rice, sorghum and vegetables, which are the staple foods usually grown in the northern part of the country require high soil fertility to churn out high yields. As already established, farmers have had to resort to using soil amendments to boost the fertility of farmlands for increased productivity. In spite of this, Bawaje

et al. (2020) revealed that the excessive use of these amendments particularly chemical fertilisers affects crop yields in two ways. Firstly, crops/plants that are grown with chemical fertilisers do not have healthy and strong life span as they lack adequate time to mature and develop good roots, strong stems or nutritious fruits and vegetables. Secondly, crops induced to grow in this manner have slimmer chances of surviving as pest and diseases easily attack them. This is attributed to their lack of healthy immune systems and adequate resistance systems (Bawaje et al., 2020). Findings from the interviews also alluded to the authors' claim on pests and diseases adversely affecting crop yield. Aside the attacks of fall armyworms on maize production, participants in a focus group discussion, reported that soil disease has recently been discovered as one of the causes of declining crop yield. A discussant stated that:

*One major problem we are facing concerning gardening is the fact that the soil at where the gardening is done was diagnosed by Agriculture Officers as having a disease which makes crop yield very poor. That disease usually affects the roots and leaves of the crops resulting in the poor crop yield. They have taken samples away and we are waiting to see what they will do next (Male Focus Group Discussant, March, 2022, Siiru).*

This soil disease, according to the participant, attacks both roots and leaves of plants resulting in poor crop yields. Even though Agriculture Extension Officers have taken samples of the soil for testing so appropriate treatment mechanism can be applied, this is yet to see the light of the day. The low crop yield resulting from declining soil fertility can potentially trigger increased food insecurity, low household income and increased outmigration, and largely amplify the vulnerability of individuals and households (GSS, 2021; Pauw, 2022). In this context, declining soil fertility is considered as creating the vulnerability context that confronts households in the study areas. As posited by DFID (2005), farmers are expected to employ other strategies, which

in this case, may include both in-situ adaptation and seasonal and permanent migration (mediated by institutions and policies) to address the vulnerability (Cannon et al., 2003).

Similar to crop farming, the data demonstrated that other livelihood activities were adversely affected by decreasing soil fertility, as claimed by the highest proportion 28(96.6%) of the respondents from the entire study areas. Whereas all the sampled respondents in the Jirapa Municipality 15(100%) posited that other livelihoods they engaged in were destroyed by declining soil fertility, a little over ninety percent of the respondents from the Wa West District (92.9%) also affirmed this claim. It can be inferred from Table 4.2 (main sources of livelihoods) that aside crop farming, trade/commerce emerged as the next major source of livelihood engaged in by 2.7 percent of the respondents from the entire study areas. Largely, households in the study areas engaged in the sale of food crops such as rice, maize, millet, groundnut, beans and vegetables, which heavily depend on the fertility of the soil to produce high yields (Derbile et al., 2022). Findings from this study support existing literature to show that these crops are severely hampered by poor soil fertility resulting in low yields (Derbile et al., 2022; van Leeuwen et al., 2019). The low crop yields coupled with peasant nature of farms allude to the fact that households may not have enough farm produce for consumption talk less of commercialising it. Farmers in a focus group discussion, reported that the sale of food crops has drastically reduced because of poor harvest, which they ascribed to increasingly poor soil fertility. A discussant opined that:

*Our farmers no longer sell food crops like they used to in this community. The poor soil fertility that we are currently facing has triggered low food crop yields, hence not enough is left to sell after consumption. Even it is always a challenge to get local market for the little we are able to make available for sale due to the widespread economic hardships that we experience. This has worsened the poverty situations of*

*most households in the community (Male Focus Group Discussant, March, 2022, Kunzokala).*

Trading or commerce (petty trading) provides climate-affected rural farmers the opportunity to diversify livelihoods (Musah-Surugu et al., 2018). The above narration, however, demonstrates the precarious situation that engulfs households resulting partly from their inability to diversify livelihoods through trading. This is due to the widespread impacts of poor soil fertility on crop farming, which degenerate into low agriculture produce, and the lack of local market for available farm produce. Declining soil fertility, in this context is partly defining the vulnerability context of households in the study areas (DFID, 2005). This finding also illustrates that the agency deployed as an alternative livelihood strategy to deal with the impacts of climate change on agrarian livelihood is constrained by environmental structures-decreasing soil fertility (Sibeon, 2004).

The quantitative survey further identified three hazards including conflict over land, problem with access to farmlands and floods as posing less adverse impacts on crop farming. Among these, floods were reported by only 3% of the respondents across the entire study areas as the least dominant hazard that negatively affected crop farming. According to the data analysed, even though smaller proportions of the respondents reported the disruption of crop production by the hazard in both districts, Wa West District had a higher respondents (4.4%) than the Jirapa Municipality (1.5%) that reported the incidence. The limited proportions that reported the incident mirrors participants' experiences shared during the qualitative study. In a focus group discussion, participants established that floods were not common in their communities. However, the occasional floods farmers experienced had impact on crop production only in specific areas. A youth focus group discussant explained that:

*In our community, we have never experienced flood. It only happens if you farm in low land area, especially those who farm yam in a low land area. Sometimes when it rains heavily like what we experienced yesterday, it can wash away the yam mounds. Apart from that, those who farm along riverbanks. Some are doing dry season farming so by now, their maize has grown up to 3 months, so when it rains heavy it will definitely wash everything away* **(Male Focus Group Discussant, March, 2022, Pinyiri).**

According to the discussants, floods triggered by heavy rains, are experienced mostly by those residing and farming in low-lying areas. This revelation supports the assertion of Teye et al. (2020), that farmers who due to long periods of drought move closer to riverbeds and do not only plant along river banks but also inside the rivers, may have their crops washed away with the onset of sudden and heavy rainfall. Farming along riverbeds and river banks is the resultant effect of aridity of farmlands caused by prolonged drought, which subsequently produces soil diseases and infertility (Bawaje et al., 2020; Derbile et al., 2022). The ability of some farmers to move to such location to farm signifies the extent to which humans can deploy their agency to deal with adverse effects of environmental forces (Holt-Jenssen, 2009). Additional view suggests that households that farm in low-lying areas have witnessed how floods have washed away fertilisers they applied on farmlands. A female participant revealed that:

*If you apply fertilizer, the floods will wash everything away. Sometimes, the beds that we raise and sow the maize on can even be washed away ...* **(Female Focus Group Discussant, March, 2022, Pinyiri).**

This event results in low crop yield as fertilisers are meant to vitalise the fertility of the soil for increased output. The impact of floods on crop production reflects a component of the vulnerability context where the hazard signifies natural shock that afflicts livelihoods of poor households (Carney et al., 1999). The phenomenon also recounts the influence of climate and environmental forces on human agency, as farmers devise strategies to mitigate the adverse impacts of climate change on livelihoods (Giddens, 1984).

Pertaining to the impacts of floods on other livelihood sources, the survey data indicated that only 3.4% of the respondents from the entire study areas recounted the impacts of floods on their livelihoods. While no respondent reported the incidence of the hazard in the Jirapa Municipality (0.0%), a little above seven percent of the respondents in the Wa West District (7.1%) claimed floods had adverse impacts on other livelihoods. Findings from the qualitative study validate the results from the survey data, as participants did not report any serious impacts of floods on other livelihoods. However, a couple of fish farmers stated that they could not access the rivers and the ponds to fish during periods of flooding. The following statement is the account of a participant during a focus group discussion:

*We do not experience much impact of floods in this community. Nonetheless, those of us who are into fish farming have our ponds washed away by the heavy floods. There are people who fish from the river. During heavy floods the river becomes inaccessible. Those of us who depend on this to feed our families are always found wanting during such times (Male focus group participant, 36 Years, March, 2022, Pinyiri).*

The above statement reveals the impact of occasional floods on alternative livelihood source (fishing) of some households. As fishing provides the capacity to meet socioeconomic needs of household members (Abobi et al., 2023; Aniah et al., 2016; Opio et al., 2013), the disruption of this livelihood source may result in worsening vulnerability of these households and the community at large (Aniah et al., 2016; Fielmua, 2017). As shown in the conceptual framework of this study, floods in conjunction with other climatic and non-climatic hazards shape the vulnerability context of households (Carney et al., 1999; DFID, 2005).

#### **4.7 Chapter conclusion**

This chapter examined the experiences of climate change and its impacts on livelihoods of households. As the findings show, crop farming emerged as the major livelihood activity undertaken by the greater proportion of the respondents (90.3%) across the entire study areas.

Though the study finds greater proportions of both males (91.3%) and females (89.3%) engaged in crop farming, a nuanced analysis with the qualitative data revealed that most women only supported their husbands in that regard. This finding, according to the literature, is largely attributed to the system of land tenure that is practiced in the area, which limits women's right to land ownership and acquisition (Abakisi, 2018; Duncan & Brandt, 2004; Songsore, 2009). This phenomenon reflects the structure-agency complexity of the structuration theory, where societal structures have the capability to constrain or enhance human agency (Sibeon, 2004). In this context, the traditional land tenure system is construed as constraining the capability of women to use crop farming as a strategy to minimise household vulnerability. Consistent with the sustainable livelihood framework where transforming structures and processes determine access to livelihood assets to devise strategy that minimises vulnerability of the poor (DFID, 2005), this traditional land tenure system is the main factor that determines women's access to land which can enhance their capabilities to deal with household poverty, food insecurity and outmigration. Although studies have posited that women's inability to access farmlands hinders and limits their productivity and contributions to the agriculture sector and food security (Abakisi, 2018; Anaglo et al., 2014), these studies however, failed to indicate that farmlands are incessantly becoming infertile, thereby adversely affecting crop cultivation. Consequently, women's access to farmlands will not make much difference in crop farming, food security and poverty reduction, given the limited institutional intervention in the area of farming input supply and rising cost of farming.

Regarding household experiences with climate related hazards, the study shows that greater proportions of the respondents in the study areas experienced both irregular rains (99.3%) and drought (98%). Pertaining to irregular rains, the study reveals that over the past five years,

households experienced too heavy rains or insufficient rain or it was either too early or too late. The study again reports that droughts are no more severe and prolong than previous rather, the hazard is more of a dry spell. The combined effects of prolong drought and irregular rains accounted for the limited influence of floods experienced by only 4% of the respondents. These findings are in tandem with recent scientific analysis of rainfall and temperature data in the Upper West Region (Baffour-Atta et al., 2022; GSS, 2021; Teye et al., 2021). However, given that a number of meteorological data on rainfall and temperature have failed and were not trusted by farmers before (Chepkoech et al., 2018; Cobbinah & Anane, 2016; Limantol et al., 2016; Hiron et al., 2018), the consistency between farmers experiences and scientific data on the occurrence of these hazards, serves as human capital through which farming is bolstered; which culminates in a declined household vulnerability. This offers an understanding of the critical role livelihood assets (capital) play in devising livelihood strategies to build resilience and to minimise vulnerabilities of farming households to climate change as portrayed in the conceptual framework of the study (Carney et al., 1999; DFID, 2005).

More so, the data show that households experienced a number of non-climate related hazards. Notable among these hazards is declining soil fertility; which was experienced by nearly all the respondents (98.7%). Statistically, the difference between households who reported this hazard in the study areas was insignificant as revealed by the chi-square ( $p=0.314$ ). The interviews found that the triggers of this hazard were partly linked to hazards such as drought, floods and irregular rains. The literature supports this finding. In the perspectives of Antwi-Agyei et al. (2021), Kebede (2019) and Scheiterle (2019), severe drought usually results in extreme temperatures, reducing soil water percolation capacity and causes soil infertility. Even though experiences and perceptions of farming households about climate related hazards are amplified

in the literature (Antwi-Agyei, 2021; Baffour-Atta et al., 2021; Derbile et al., 2022), households' experiences with non-climate related hazard such as decreasing soil fertility usually receive less attention (Asare & Ebo, 2019). The larger portions of farmlands that are increasingly being lost to soil infertility is indicative of the limited impacts of mitigation and adaptation measures employed to deal particularly with hazards such as drought, irregular rains, and extreme temperatures.

The combined analysis of the impacts of both climate and non-climate related hazards on livelihoods revealed that, crop farming is adversely affected predominantly by declining soil fertility (98.2%), irregular rains (97.8%) and drought (95.6%). On declining soil fertility, the study discovers that both drought and irregular rains degenerate into poor crop yields through decreasing soil fertility. The research reveals that the severe impact of the hazard on crop farming accounts for poor crop yields, food insecurity and increased poverty, and worsening socioeconomic vulnerability in the region (Antwi-Agyei, 2021; Baffor-Atta et al., 2021; Debile, 2022; GSS, 2021; Leon-Moreno et al., 2019; Pauw, 2022). To boost the fertility of the soil for improved crop yield, the study reveals that, farmers resort to the use of soil amendments including inorganic fertilisers. The study further discovers that declining soil fertility adversely affected other livelihood sources including trading through poor crop yields, as farmers barely had enough for household consumption talk less of selling. As displayed in the sustainable livelihood framework, a combination of declining soil fertility, drought and irregular rains shaped the vulnerability context of households, and as a strategy to address the vulnerability, famers apply fertilisers on farmlands to enhance crop yields (DFID, 2005). However, accessing these fertilisers is challenging due to its high cost, non-availability, and limited government subsidies (Nuhu and Wale, 2023; Yakubu et al., 2019). Notwithstanding, current studies are

showing that excessive use of chemical fertiliser on farmlands negatively affects agriculture output through its impact on the health and life span of crops; and through pest and diseases as the product weakens the immune system of plants (Adekunle et al., 2017; Bawaje et al., 2020).

From the foregoing, my reflections are that, access to farmlands (for both men and women) is not a panacea for improved crop yield, enhanced food security, improved poverty situations and reduced outmigration. This is because farmlands are increasingly losing fertility, a major determinant of increased crop production. This livelihood source could better be enhanced through institutional input support schemes. More so, experiences of farmers with climate hazards over time will not only build the human capital base of these farmers, but will also help in defining and adopting tailor-made adaptation strategy that produce the desired results.



## CHAPTER FIVE

### MIGRATION AS A COPING OR AN ADAPTATION STRATEGY TO DEAL WITH THE IMPACTS OF CLIMATE CHANGE

#### 5.0 Introduction

This chapter presents the analyses and discussions on the extent and how migration is employed as a coping or an adaptation strategy by households to deal with the adverse impacts of climate change. This broad theme is further divided into five sub-themes, which segmented the chapter into five sub-sections. As an old-age phenomenon, the first part of this chapter explores the historical antecedents of migration (climate-induced migration) in the study areas. While the second sub-section sheds light on the major reasons for which people migrate out of the region, the third section provides information on the main destinations of the migrants. The fourth part explores how and the extent to which migration provides a temporary means of coping with climate change perturbations. The fifth section also provides detailed analysis and discussion on how migration is employed as an adaptation strategy by households to address the negative impacts of climate change. Lastly, the chapter also explores possible reasons for which some household members could not migrate even though they aspired to.

#### 5.1 Historical Antecedents of climate related migration

Human migration has been part and parcel of the inhabitants of the Upper West Region even before the arrival of the colonial masters. Migration in the pre-colonial era was characterised by short distance movement undertaken by many (Jarawura and Smit, 2015). Goody & Goody (1967) and Lentz (2006) recounted that people migrated purposely in search of fertile land for farming, vast ground for hunting, and to escape from conflict and slave raiders. Given that soil infertility is partly caused by climate change and variability (Derbile et al, 2022; Kebede, 2019;

Scheiterle, 2019), it could be argued that even in the olden days, climate and environmental factors had a role to play in human migration. This period of migration is described by Cleveland (1991) as “a tradition of local migration by many and long-distance migration by a minority of warriors and traders” (p. 222). This pattern of migration is supported by Ravenstein’s law of migration stated as, ‘most migrants move to short distance destinations’ (Ravenstein, 1885), which literally means, the longer the distance between the origin and the destination, the smaller the flow of migration. According to Abdul-Korah (2007), migration during that era was predominantly undertaken by men with women particularly wives accompanying their husbands. In other words, women could not migrate independent of their spouses. More so, similar to current trends of movements, migration then could be described as both voluntary and involuntary. While voluntary movements had much to do with trading activities, though to a limited extent, involuntary or forced migration stemmed from conflict and activities of slave raiders. As indicated by Der (1998), substantial amount of slaves were captured from the region and sold to traders who later sent them to Ashanti, the Gold Coast, and the Americas. Aside from that, the practice of shifting cultivation compelled local farmers to move from one locality with less fertile farmlands to another of a more fertile land. In addition, pastoral nomads, due to unfavourable environmental conditions were constantly migrating from one area to another in search of pasture for grazing by their livestock (Tanle, 2014; Van der Geest, 2011). During this era, the role of environmental factors (environmental structural scarcity) was very minimal in the migration of people to southern Ghana due to insecurity stemming from warfare and activities of slave raiders (Van der Geest, 2011). Similar assertion can be made about the role of governance (national policies and local institutions) in addressing climate and environmental migration at the time (Teye et al., 2020).

Several factors support the fact that migration in the region during the colonial era was more of long-distance movement than short-distance, as inhabitants migrated to southern Ghana either on their own volition or under compulsion (Yaro, 2008). It is, however, imperative to note that involuntary migration to the south was not only predominant, but also, preceded voluntary migration. Similar to the pre-colonial era, involuntary migration of mostly Dagaaba men to the south resulted from the harsh colonial rule and the institution of capitalist economy in the Gold Coast in the first decade of the twentieth century (Abdul-Korah, 2004). The present-day northern Ghana including the Upper West region was captured under the British colonial rule in the 1901s. Scholars have argued that the deliberate attempt to include the northern regions as protectorate of the colonial masters was because of their quest for labours who could work on their mines, cocoa farms and construction sites (Adepoju, 1995; van der Geest, 2011). Literature, more so, shows that there was a deliberate attempt to limit socio-economic development to the south while the north was only made to supply labour to work in the aforementioned sectors (Tanle, 2010; Teye et al., 2020). In his assertion, Sir F. M. Hodgson in 1899 stated that:

*“For the present I therefore cannot too strongly urge the employment of all available resources of the Government upon the development of the country to the South of Kintampo leaving the Northern Territories to be dealt with in future year...I would not at present spend upon the Northern Territories—upon in fact the hinterland of the Colony—a single penny more than is absolutely necessary for suitable administration and the encouragement of the transit trade” (Songsore and Denkabe, 1995, p.10).*

The forcibly recruitment of labour from the north to the south intensified when the District Commissioner at the time tasked Chiefs of the Protectorates to aid in recruiting capable men to work at the mines, cocoa farms, security services and construction sites (Anarfi, 2003; Denkabe, 1995). Part of the reasons for which chiefs played major role in the recruitment process was due to the harsh environmental conditions in the north, which discouraged the colonial masters from establishing camps up north (Lemberg-Pedersen, 2019). According to Songsore (2003), in 1906,

for instance, the Protectorate alone supplied 12,000 labours to work in the Prestea and Tarkwa mines. The northern territories experienced increased labour recruitment in the period between 1919 and 1924 in respect of meeting the estimated 27,000 labours needed to work in the south, as revealed by the Guggisberg's 1919 Development Plan. Aside from labours recruited to work in the mines, a number of people were also recruited from the north to the work in the cocoa and oil plantations in the Brong Ahafo and Ashanti regions (Tanle, 2010). With specific reference to the Upper West Region, the colonial state recruited the first set of 26 Dagaaba men for the mines in 1907, a process that has persisted until today (Lentz, 2006; Songsore & Denkabe, 1995).

Apart from the aforementioned form of involuntary migration to the south, the inhabitants of the region undertook some level of voluntary migration. The first batch of forced migrants experienced poor conditions of work and high mortality rates in the mines. Nonetheless, these labour migrants returned with goods and enticing stories that fueled outmigration of potential migrants to the south (Lentz, 2006). To this end, labour migration to the same destinations of the returned migrants became the most adopted livelihood strategy, and could best be described as rite of passage for the male youth (Lentz, 2006). According to Abdul-Korah (2006), migration during the early decades of the twentieth century was predominantly a male-youth-affair. The second half of the twentieth century, however, witnessed steady female migration from the north to the south (Abdul-Korah, 2011). Also, for a period of 50 years (1907-1957), wives of Dagaaba men who migrated to the south were left behind due to the seasonal and short-term nature of migration embarked upon by their husbands (Songsore, 1983). However, the migration of other women during the colonial period was very limited, and tied to male migration, as they had to join their spouses for the purposes of raising family and supporting their work (Abdul-Korah, 2011). Conclusively, marriage then became the channel through which women especially the

unmarried realised their southern-Ghana migration dreams, as many young girls who migrated with the intention of visiting relatives ended up settling down with young and hardworking Dagaaba men (Abdul Korah, 2011).

Migration from the Upper West Region to the south after the colonial era was mainly driven by a combination of socioeconomic, political and environmental factors (Teye et al., 2020), though literature was silent on aspirations and capabilities of potential migrants (de Haas, 2021). The pattern of migration in the period right after post-colonial era through the 1980s shifted from seasonal and short-term to long-term or permanent movements. Much of this is attributed to worse environmental and livelihood circumstances in most rural part of the north (Fielmua, 2017; Tanle & Kyereme, 2014; Van der Geest, 2011). It has been noted that decision to move from the region were hinged on poor crop yields and limited farming lands (Van der Geest, 2011). In a wider perspective, human movements from the north to the south were related to factors such as rainfall patterns, crop yields, vegetation cover, and rural populations that over-cultivate available farm lands thereby compelling some to seek other subsistence means of living (Tanle & Kyereme, 2014). It is, nonetheless, difficult to pinpoint environmental factors as the sole push factor given that migration decisions are influenced by several factors. Some instances with regard to environmentally motivated migration in conjunction with other factors that occurred within the period under review are analysed in the following paragraphs.

In Ghana, the era between the 1970s and few years after 1980 are essentially remembered for severe droughts. Notwithstanding that, the droughts had nationwide impacts, farmers in the north felt impacts that were more distressing, as they had to battle with worse agro-ecological situations, lack of non-farm livelihoods and high poverty levels (Van der Geest, 2011). It is, however, interesting to note that in–spite of the impact on food, the region at the period rather

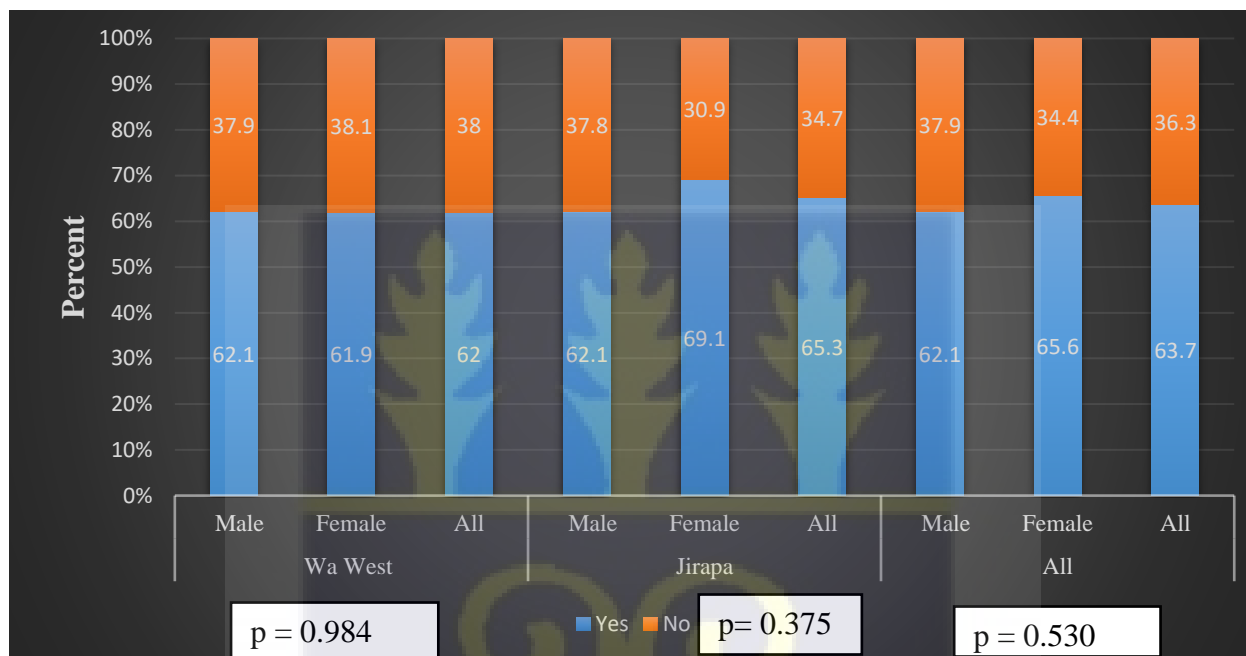
experienced minimal outmigration levels. This speaks of the complex relationship between migration and climate and environmental factors (Hoffmann, 2020; Zickgrafe, 2021). In this case, several other factors might have been considered by the affected households, which may include affluence, educational and environmental factors (Awumbila, 2014). According to Van der Geest (2011) and Jarawura and Smit (2015), reduced outmigration from the north to the south may also be influenced by conditions from the national, economic and political climates, in addition to the impacts of drought southwards. The region again witnessed increased outmigration in the 1990s, with the improvement in the rainfall. This occurrence could be attributed to the developmental gap between the north and south since 1990s, a phenomenon propped by the improvement in the economy of the south (GSS, 2017). In explaining the dynamics behind the increased outmigration to the south, it is also important to focus on the droughts of the 1970s. In addition, one cannot ignore the first few years within the 1980s, the increased rate of bush fires between 1978 and 1983, and the downturn of the economic, and political conditions dating back to the 1960s which endeared guidelines for economic repositioning from the World Bank and the IMF (Oteng-Ababio, 2016). Today, migrations from the north to the south are triggered by a combination of economic, social, political and environmental factors. Given that migration has long been used as a livelihood strategy, it could be concluded that climate and environmental changes are not the sole drivers of migration.

## **5.2 Incidence of Migration**

Given that historical accounts and existing literature have touted the high incidences of outmigration of household members from the Upper West Region (Abdul-Korah, 2011; Goody, 1967; Jarawura and Smit, 2015; Lentz, 2006; Tanle & Kyereme, 2014), it is important to ascertain with empirical evidence from current studies, the extent to which people are migrating

from the region. On that note, this study sought to find out the proportion of households with and without migrants. In doing so, household heads or respondents were asked, ‘has any member of your household moved permanently or temporary within the last 10 years (i.e 2010–2020) out of this village?’ Respondents were to indicate either ‘yes’ or ‘no’. The responses are shown in figure 5.1 below.

**Figure 5.1: Proportion of migrants and non-migrants households**



**Source: Fieldwork, 2020**

The overall analysis presented in figure 5.1 showed that majority of the respondents (63.7%) across the two districts had household members migrating out of the communities. The higher proportion of migrant households is indicative of rising incidence of outmigration in the study areas. Buttressing this finding, some respondents in the qualitative study reported that outmigration in recent times has assumed an upward trend, a situation they attributed to rising negative effects of climate related hazards (drought, irregular rains and declining soil fertility etc.) on their farming activities. This phenomenon resonates with the assertion of Boas et al.

(2019) that, outmigration is usually high in areas where households experience high degree of climatic hazards couple with weak adaptive capacity. Below is the account of a participant:

*I think to a very large extent people move out. And they do so because most of the people are farmers and after the dry season, there is nothing to do here than to idle about or sleep under Sheds. So you have to migrate. And the harvest you get here is very low because most people cannot afford the cost of fertiliser. Sometimes even if you apply the fertilizer, you still don't get much. So, people migrate to make extra money to supplement what they harvest (Female, 38 Years, March, 2022, Kunzokala).*

This narration sheds light on the indirect relationship between climate change and migration, as theorised by Ribot et al. (2020). According to the participant, during periods of drought farming is grinded to a halt for many local farmers, a phenomenon that has the tendencies to trigger poor harvest as farmers lack the financial capacity to purchase fertilisers to boost crop yield. As this situation leads to idleness and low income, farmers decide to migrate to different destinations in search of better livelihood opportunities in order to earn extra income to supplement household's food basket. Migration in this sense is considered a livelihood diversification strategy against the impacts of climate change (Vinke et al., 2021). The principle of duality of structures as espoused by Holt-Jensen (1999) plays out in this instance. Thus, despite the impact of the dry season (climate and environmental structures) on livelihoods of households, some household members are able to employ migration as a change agent to address their socioeconomic challenges such as food insecurity, income losses and increased household poverty (Schroth et al., 2016; GSS, 2017).

The gender distribution indicated that the proportion of females (65.6%) who had members migrating were more than their male counterparts (62.1%) who equally confirmed the incidence. Given that female outmigration has always been relatively lower than males' in the study areas (Abdul-Korah, 2011; Tanle, 2014), it is surprising to note that female household heads are

currently producing more migrants. This implies that female household heads are increasingly involved in the migration decisions of their members (Abutima, 2019). It could thus, be argued that migration stemming from climate change is reshaping gender role of both male and female household heads. Disparity at the district level, however, revealed that Jirapa Municipality had slightly higher proportion (65.3%) that reported migration frequencies of household members than their counterparts in the Wa West District (62%). The phenomenon aside other socioeconomic factors, may be attributed to the fact that Jirapa Municipality is largely dominated by Dagabas who are considered more migratory than the Walaas and Birfos that dominate the Wa West District, who are also by nature sedentary (Lentz, 2006; Tanle & Kyereme, 2014). This assertion is confirmed by a response from the qualitative study presented in the following statement:

*The Waalas do not migrate – they usually operate grinding mills in the community. The Dagara and Birfo are the groups that travel the most but Birfo do not migrate like the Dagara women. Even elderly Birfos do not travel, it is the younger ones that do. The Dagara usually travel out and return later (Female, 84 Years, March, 2022, Kunzokala).*

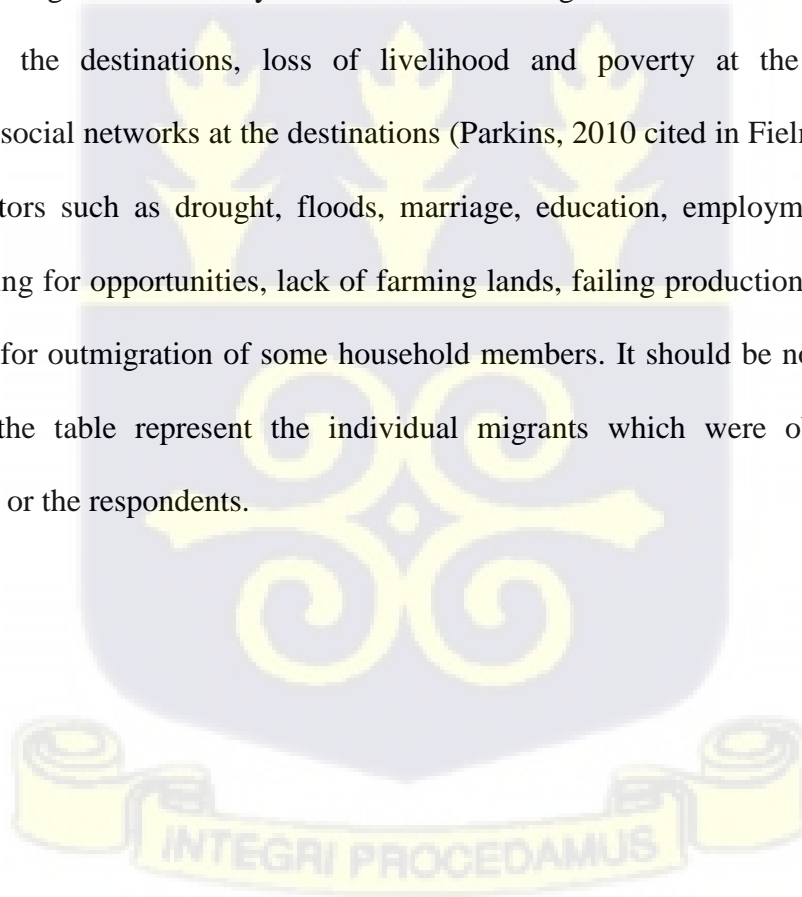
The statement above demonstrates that economic and historical structures underpin the current patterns of outmigration in the study communities. That is, the type of economic activity the Waalas engaged in (grinding mills) encouraged them to stay put while the historical antecedents of migration of the Birfos and Dagaras influenced current migration trends. The phenomenon where these structures on one hand constrain migration, and on the other enhance migration reflects the relationship between structures and human agency as posited by (Sibeon, 2004).

Similarly, the gender dynamics with respect to the districts also portrayed that while both districts had the same proportion of males (62.1%) who claimed had out-migrants; Jirapa Municipality had a higher percentage of female respondents (69.1%) with migrants than their

colleagues in the Wa West District (61.9%). The chi-square value ( $p=0.530$ ) showed a statistically insignificant relationship between migration status and gender of household heads in the two main study areas. This shows that there are no variations in the male and female respondents who had household members migrating out of the community.

### **5.3 Reasons for Migration**

Reasons or drivers of migration refer to the factors that compel the inception and perpetuation of migration (de Haas, 2021). Potential migrants believe that what is absent at the place of origin exists at the destination, hence their decision to migrate. Migration resulting from climate and environmental changes is fueled by conceived or existing socioeconomic factors and better opportunities at the destinations, loss of livelihood and poverty at the origin, informal institutions, and social networks at the destinations (Parkins, 2010 cited in Fielmua, 2017). In the study areas, factors such as drought, floods, marriage, education, employment opportunities, hustling or looking for opportunities, lack of farming lands, failing production and lack of work here, accounted for outmigration of some household members. It should be noted here that, the proportions in the table represent the individual migrants which were obtained from the household heads or the respondents.



**Table 5.1: Reasons for migration**

Reasons	Wa West			Jirapa			Overall		
	Male N=162	Female N=41	All N=203	Male N=179	Female N=53	All N=232	Male N=341	Female N=94	All N=435
	%	%	%	%	%	%	%	%	%
Drought	1.9	0.0	1.5	1.7	0.0	1.3	1.8	0.0	1.4
Floods	0.6	0.0	0.5	-	-	-	0.3	0.0	0.2
Education	10.5	22	12.8	13.4	15.1	13.8	12	18.1	13.3
Marriage	0.0	39.0	7.9	0.0	24.5	5.6	0.0	30.9	6.75
Employment opportunity	27.2	12.2	24.1	26.3	28.3	26.7	26.7	21.3	25.5
Hustling/Looking for opportunities	56.8	19.5	49.3	39.1	28.3	36.6	47.5	24.5	42.5
Lack of farming lands	1.9	2.4	2.0	6.2	2.4	2.0	4.1	1.1	3.5
Failing production	1.9	0.0	1.5	4.5	1.9	3.9	3.2	1.1	2.8
Lack of work here	29.6	14.6	26.6	7.8	5.7	7.3	18.2	9.6	16.3
Others	15.4	12.2	14.8	29.1	15.1	25.9	22.6	13.8	20.7

**Source: Fieldwork, 2020**

The overall analysis of the survey data demonstrated that outmigration of household members was fueled mainly by economic factors such as employment opportunities, hustling/looking for opportunities and lack of work at the study communities. Out of these, hustling or looking for opportunities elsewhere was reported as accounting for the migration of the highest proportion (42.5%) of household members. As established earlier, climate change and its impact on livelihoods has enraptured households in economic hardships (Antwi-Agyei et al., 2021). To cope with these precarious situations, some household members embarked on migration to seek better economic opportunities at various destinations for the purposes of diversifying livelihoods (Awumbila, 2014; Teye, 2019). However, the inability of migrants with low human capital development (unskilled and semi-skilled) to acquire formal, high-paying and dignifying jobs coupled with national socioeconomic situations force them into hustling in both rural and urban centres for survival. Regarding the overall gender distribution, it was gathered that while nearly half of the male migrants (47.5%) were motivated to move in search of better opportunities

through hustling, almost a quarter of the female migrants (24.5%) moved with the same intention. The greater margin between the proportion of males and females who migrated for this purpose may be attributed to historical antecedents of migration which witnessed more males always moving than females (Tanle, 2014; Van der Geest, 2011); and the fact that it is easier for males to secure menial jobs than females at the destinations (Abutima, 2019; Awumbila, et al., 2016). The common forms of hustling migrants engage in include but not limited to waged farm labour work ('paa'), head portorage (kayayei), illegal mining (galamsey), cashew nut picking, street hawking and petty trading. Corroborating the survey data, findings from the interviews revealed that while some males hustle by engaging in farm labour activities locally called "paa oo paa" and illegal mining (galamsey) at the destinations, the females especially the youth engage in head portorage locally called 'Kayayo' or "paa oo paa" as well. According to a discussant in a focus group discussion, "paa" is a livelihood diversification strategy 'bequeathed' to them by their ancestors especially the Dagabas:

*You asked of when 'paa' (migrating for farm work) started, when we all were growing up, there was 'paa'. When our fathers were farming, there was 'paa' and if you are to assess you can say 'paa' has reduced. It is we the stubborn ones who still go there, if not most people don't go there. It is galamsey they all do now, so if you say it is now that 'paa' started you are telling lies. It was that time Dagabas were engaging in 'paa' but now 'paa' has reduced (Male Focus Group Discussant, March, 2022, Siiru).*

The livelihood activities ('paa' and galamsey) mentioned in the narration above are evident of how households strategise or rely on their agency to address climate vulnerabilities, a phenomenon that conforms with the postulation of Carney et al. in the sustainable livelihood approach. More so, the participants expounded that even though 'paa' currently does not fetch much income, people still consider it an option as migration for such purpose is on the increase. A couple of reasons were advanced in support of the perpetuation of this form of migration.

These included first, the challenge of being pursued at galamsey sites (even though galamsey fetches more income) by soldiers and taskforce as they enforce government policy directives on illegal mining activities; and second, to avoid idling about which could force them into perpetrating social vices like stealing. Emphasising the phenomenon, a participant revealed in a focus group discussion that:

*It is because of the constant chasing of people at galamsey sites that makes 'paa' still relevant today, you would want to sit idle. [...]. So those who may not want to engage in 'paa', you will sit idle and once you sit idle, what will be the end result? It is stealing you will resort to (Male Focus Group Discussant, March, 2022, Siiru).*

The quotation above revealed that even though farmers tried to deploy their agency (by engaging in illegal mining at the destinations) to mitigate the impact of climate change on their livelihoods, this effort is constrained by government policy on illegal mining (galamsey). This phenomenon reflects the perspective of the proponent of the structuration theory where structures constrain the agencies deployed by the individual (Giddens, 1984).

As highlighted earlier, “Kayaayo” has provided a means of survival for young females at the destinations particularly the south. Participants, however, revealed that while adult women who migrate mostly without their spouses engage in cashew nut picking, those who migrate with their husbands usually support them as co-farm labours. A clearer picture painted by a participant in a focus group discussion is presented in the following statement:

*As for the women unless 'Kayayo', they go to a place called 'Tavama' that is where they do this kayaayo work somewhere in Kumasi, Techiman and Accra. 'Tavama' refers to a situation where several head porters meet at a point of duty to carry loads. And as they make haste to carry the loads they mistakenly attempt to clash with each other, then they would say to each other my friend 'Tavama' meaning (don't hit me) (Male Focus Group Discussant, March, 2022, Siriyiri).*

Given that the people in the region have practiced ‘Kayayie’ for a long time, the study sought to probe into the reasons for which some young females undertake such economic activity. The case of a return migrant, which reflects that of other young girls, sheds light on some of the reasons. Salo is a 21-year-old woman who had a dream of pursuing her senior high education after completing junior high school. However, she could not realise this dream as her poor peasant farmers who have been experiencing low crop yield because of the impacts of climate change, became financially incapacitated. To help herself and the family, she decided to move to Kumasi where she engaged in Kayayei. Out of the meagre money she makes, she remits home. Her case is presented below:

*My parents have been small-scale maize and groundnut farmers all their lives. But for the past 7 years, crop yields have consistently been very low owing to the severe impacts of drought and poor soil fertility. This has brought hardships on the family as we depend on the farm proceeds for food and other socioeconomic needs. After I completed my junior high school, my parents told me that given the financial stand of the family at the moment they would not be able to see me through senior high school, which was actually my dream. Given that there were no other livelihood activities I engaged in to support myself and the family, I decided to join my friends in Kumasi to hustle. However, I had to fetch firewood to sell for 3 months before I was able to raise money for my transportation. Upon reaching Kumasi, I thought I could get informal jobs to do but I did not have the right qualification for it. I had to finally join my friends to engage in head portorage (Kayayei). As and when I made small money I remitted home for their upkeep (Salo, 21 Years, March, 2022, Siiru).*

The case above describes the circumstances under which young girls migrate to the south to engage in head portorage. Climate change is exacerbating socioeconomic situations of farmers in the study areas through crop failure compelling household members to find other means of diversifying livelihoods including migration. Consistent with the DFID Sustainable Livelihood perspective (Small, 2007), households manage vulnerabilities through the adoption of certain livelihood strategies, in this case outmigration. Part of Salo’s case (she could not realise her

dream of pursuing secondary education) also enlightens that a holistic approach to dealing with climate change is needed, as the phenomenon has implications for socioeconomic development of individuals, households and the country at large (Ribot et al., 2020; Teye et al., 2021). For instance, studies have shown that increased rural-urban migration has resulted in urbanization and its attendant social vices in some cities in Ghana (Awumbila, 2014; Teye et al., 2019).

The disparity at the district level, as illustrated in Table 5.1, indicated that more people in the Wa West District (49.3%) migrated to hustle or to seek better opportunities than those in the Jirapa Municipality (36.6%). This finding suggests that socioeconomic challenges which are largely caused by crop failures emanating from climate change that compel people to migrate are worse in the Wa West District than the Jirapa Municipality. This argument is supported with the fact that the District has been identified as not only the poorest in the Upper West region but also the poorest in the entire country (GSS, 2021). In this context, socioeconomic and environmental structures that are enabling outmigration are consistent with the tenets of Giddens' (1984) structuration theory. The proportions of migrants that were motivated to move in pursuit of better economic opportunities in relation to employment and increased income confirm Ravenstein's postulation that pull factors are more important than push factors (Ravenstein, 1889). The author further elucidated that the aspiration to see one's life improved is more crucial than the aspiration to move out from unpleasant situations, or the stress or strain factors, which compel people to move.

Aside from economic reasons, the survey data revealed that climate and environmental factors such as drought and floods have altogether resulted in the migration of the lowest proportion (1.6%) of the out-migrant population across the study areas. However, given that drought is commonly experienced in the study areas, it is imperatively important to examine how it shapes

outmigration. Overall, the data gathered from the respondents indicated that only 1.4% of the migrants were forced to move as a result of negative effects of drought. It was further learnt that 1.8% of the male out-migrants were pushed out of the communities due to the adverse effects of drought. The same reason, however, could not be established about female migrants as respondents could not link their migration to the incidence of drought. Pertaining to the district level distribution, it was revealed that the proportion of out-migrants in the Wa West (1.5%) was a little more than their counterparts that were forced to migrate in the Jirapa Municipality (1.3%). This marginal difference may be explained by the fact that Wa West District is more rural in nature with majority (97.2%) of its inhabitants engaged in crop farming than Jirapa hence, suffers the impact of drought that results in socioeconomic vulnerabilities, thereby fueling outmigration (Sam et al., 2020; GSS, 2021). However, during the qualitative study, a number of participants implicitly linked drought and other climate related factors to increased outmigration. A male focus group discussant shed light on this phenomenon as captured in the following statement:

*The prolonged dry season couple with the rather too short single farming season are our major challenge in this community. For instance, when we finish farming by November, we have to sit at home from November to April doing nothing. If you sit at home you will exhaust the little you got from your previous harvest. So, they have to go out and search for money to support their families. Usually by the time they come back in April, the little food they stored at home before traveling is always finished. They have to use the money they got from the south to feed the family while farming continues*  
**(Male Focus Group Discussant, March, 2022, Pinyiri).**

The above narration indicates that in addition to drought, one farming season renders local farmers jobless after harvesting. According to the participants, staying in the communities after farming season is tantamount to increased poverty and hunger as they end up consuming the little harvested even before the commencement of the next farming season. Migration therefore,

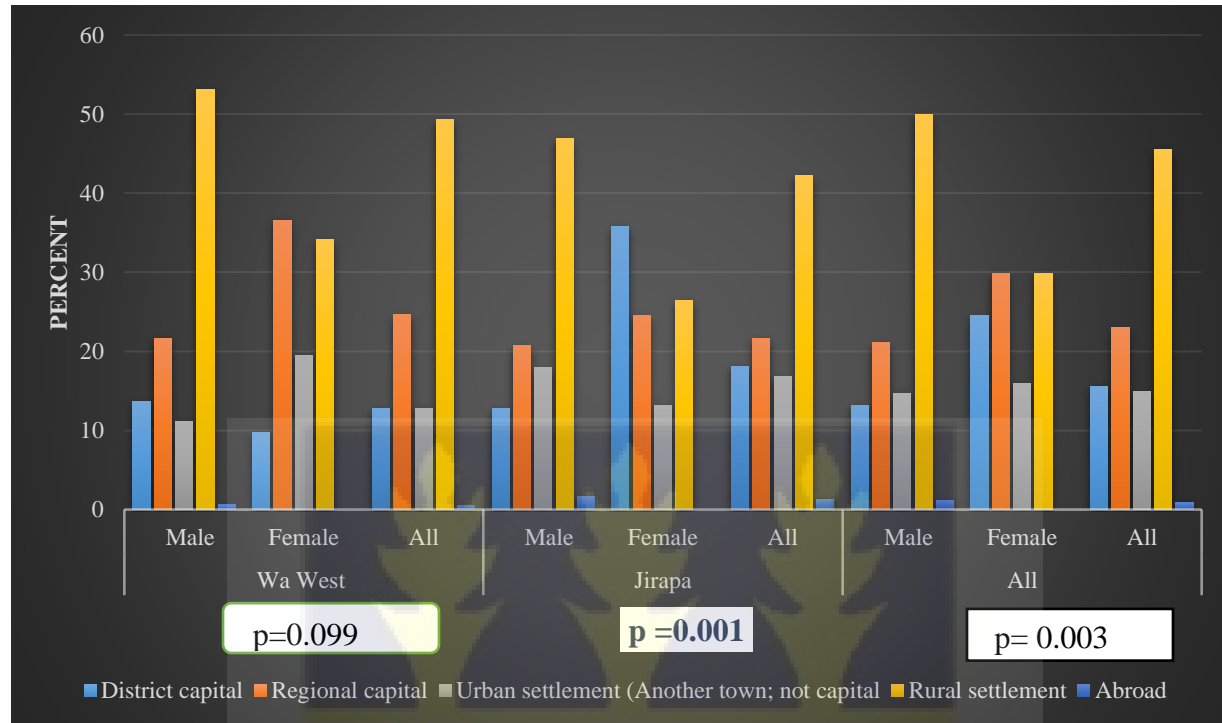
becomes their safety net (survival migration) as it offers them the opportunity to supplement the little harvested with incomes obtained through hustling at the destinations. This finding resonates with the concept of duality of structures (Holt-Jensen, 1999), as irrespective of the impediment environmental structures place on household livelihoods, households are able to deploy migration as their agency to overcome such impediment. The low proportion of out-migration resulting from climate related hazard from typical drought-prone areas with high incidence of rain-fed agriculture as such, is a manifestation of the limited appreciation of the intricate association between climate change and migration. This confirms the assertion of Ribot et al. (2020) that, the simplistic explanations of the climate change and migration nexus overshadow the multiple causes of precarity and the actual reasons for which people are migrating. These causes such as food insecurity, landlessness, high input prices, lack of storage facilities, no or limited irrigation systems, lack or limited access to finance and so on have been referred to by other scholars as intermediary factors between climate change and migration (Rigaud et al., 2018). This phenomenon also resonates with the minimalist's perspective that, migration of households experiencing climate-related hazards is influenced by a combination of social, economic, environmental, political and cultural factors, and also aspirations and capabilities of the potential migrants (de Haas, 2021; Martin, 2017; Zickgraf, 2021).

#### **5.4 Main Destinations of Migrants**

According to Aydemir and Duman (2021), destination choices of migrants are primarily determined by factors such as motives of migration, the role of networks, economic conditions, and distance from the origin to the destination and existence of amenities in different destinations. After establishing the main push and pull factors in this study, it was also imperative to identify the various destinations migrants move to. In this study, destination areas

such as district capital, regional capital, urban settlement (i.e another town; not capital), rural settlement, and abroad were identified.

**Figure 5.2: Main Destinations of Migrants**



**Source: Fieldwork, 2020**

As illustrated in Figure 5. 2, almost half of the migrant population (45.5%) across the entire study areas migrated to rural settlements as their preferred destination. The gender dynamics also enlighten that more males (49.9%) than females (29.8%) migrated to the same destination. At the district level, the survey showed that Wa West District had approximately fifty percent of the migrant population (49.3%) choosing rural settlement as their favorite destination, whereas Jirapa Municipality had a little over forty percent of its out-migrants (42.2%) migrating to rural areas. Similarly, the proportions of males (53.1%) and females (34.1%) in the Wa West District who migrated to rural areas were higher than their male (46.9%) and female (26.4%) counterparts in the Jirapa Municipality who moved to the same destination. The result of the Chi-

square analysis ( $p=0.003$ ) reveals a statistically significant relationship between destination choices and gender of migrants in the two main study areas. This implies that more males than females migrated to rural settlements. This finding challenges the long held assertion that migration flow has always been from the north to cities in the south or from rural to urban centres (Abdul-Korah, 2011; Anarfi, 2003; Fielmua, 2017; Tanle, 2010; Van der Geest, 2011). Drawing on Aydemir & Duman's (2021) assertion on destination choices of migrants, the choice of this destination was underpinned by the motive or reason of migration. In affirming this argument, a participant in an interview stated that the destinations migrants select in recent times have more to do with where they can realise their aspirations (secure jobs) than whether the area is urban or rural. Here is the account of an opinion leader in one of the study communities:

*Does the area really matter? When they are looking for job they do not care whether the area is urban or rural once they can get job and money they will go. Some go to the Sisaala areas such as Lambusie, and Tumu, others go to Bole while some go to villages around Sefwi (Opinion leader, 46 Years, March, 202, Pinyiri).*

In that regard, participants reported that due to hunger and poverty caused by a combination of crop failure and single farming season, people are willing to move to any destinations where they can find menial jobs that provide means of sustenance during the dry season. Findings from the qualitative study revealed that increased outmigration to rural areas is attributed to illegal mining (galamsey) activities currently emerging at nearby villages. It was recounted that galamsey activities are gradually becoming a novel means of diversifying livelihoods and household income hence, during the dry season where climate conditions do not support farming activities, many male youth and sometimes adults move to these villages. Literature, however, enlightens that though females also move to these rural galamsey areas, they do not necessarily engage in illegal mining, instead some migrate there to engage in petty trading while others join their boyfriends or husbands (Teye et al., 2021). This may partly explain the low proportions of

female migration to rural areas as illustrated in the survey data. Others also moved to rural farming communities where they engaged in clearing of farmlands, crop harvesting and cashew nut picking for daily wages. Reporting on the reasons for which many move to rural areas, some participants had these to say:

*The reason is the galamsay. Whenever they hear that the galamsay is doing well there, you see them move overnight (full Sanyong bus), they are gone. So they are not stable* **(Opinion leader, 37 Years, March, 2022, Kunzokala).**

*[...]. Some of them go to the villages to farm cocoa. Sometimes the young men also travel to work in local gold mines (galamsey). They do that because their parents are poor – so they drop out of school to join galamsey in order to make some money to feed the family. Education is affected in this community* **(Female, 84 Years, March, 2022, Siiru).**

As revealed in the narrations above, rural-rural migration is driven mainly by changes in environmental and socioeconomic structures. For instance, household poverty and availability of some economic activities in other rural areas influenced the youth in particular to move to such destinations. According to Schraven (2016), these structural transformations have resulted in rising rural-rural migration than rural-urban migration in the sub-Saharan Africa. The high attrition rate of the youth from school due to mobile livelihoods has the potentials of deepening the vicious cycle of poverty in the study areas. This phenomenon emphasises the catalytic role of climate related hazards in worsening vulnerabilities of households as highlighted in the conceptual framework of the study shown by Carney et al. (1999). It should be stated further that migration to these rural destinations are usually seasonal and short-term (Awumbila, 2014; Teye et al., 2019).

The next most preferred destination of migrants is the regional capital of the Upper West Region, Wa, as nearly half (23%) of the proportion who migrated to rural settlements moved there. Unlike migrants who moved to rural settlements, the proportion of females (29.8%) that moved

to the regional capital exceeded the proportion of males (21.1%) who migrated to the same destination. Destination choices across the districts indicated that whilst approximately a quarter of the respondents in the Wa West District (24.6%) moved to the regional capital, a little above one-fifth of the respondents in the Jirapa Municipality (21.6%) also moved there. The slightly higher proportion of respondents from the Wa West District that moved to the regional capital may be explained by the district's proximity to the capital city than the Jirapa Municipality. More so, the small proportions from both districts that moved there may be linked to the limited socioeconomic opportunities in the regional capital (Tia et al., 2023), a phenomenon that confirms GSS' (2018) claim of high incidence of poverty in the region. The qualitative study, however, indicated that the few people that moved to Wa were apprentices learning tailoring, hairdressing, dressmaking, carpentry and masonry. Others according to the participants, were students and petty traders (whose movements are best described as circulation). A respondent during an in-depth interview reported that:

*I mentioned earlier that some people do handy works like weaving, carpentry etc as their livelihood activity and most of them usually go to Wa, learn these handy works and come home to settle (Female, 52 Years, March, 2022, Siriyiri).*

The statement above points to the fact that migrants mainly engaged in menial jobs in the regional capital for survival. Notwithstanding, given that the capital city has limited economic activities (GSS, 2021; Tia et al., 2023), not enough financial incentives are derived from hustling thereby exacerbating the vulnerability of household members, who already have their agrarian livelihoods disrupted by climate change (Derbile et al., 2022; Tetteh et al., 2023).

The gender disparity concerning the respective districts revealed that, the proportions of females (36.6%) and males (21.6%) from the Wa West District that migrated to the destination were relatively higher than the proportion of females (24.5%) and males (20.7%) from the Jirapa

Municipality that moved to the said destination. As indicated by the chi-square analysis ( $p=0.003$ ), destination choices of migrants and gender of migrants across the two study areas are statistically significant; implying a significant difference between male and female migrants who moved to the regional capital. That is, more females than males migrated to the said destination. This pattern of migration could be linked to the fact that most of the females that moved there may be petty traders, as this economic activity is predominant in the capital city (Tia et al., 2023). Reports from the qualitative study also amplified this finding. For instance, a female participant revealed during an in-depth interview that females usually migrate to Wa and engage in petty trading including street hawking. She stated, moreover, that outmigration is high during the dry season as farming activities are usually slow. However, migrants return to the communities to farm during the rainy season. Her report is presented in the statement below:

*The women in this community migrate to Wa when the dry season sets in to engage in petty trading. This is because we are not able to farm as majority of us do not have the required facility to practice dry season irrigation farming. We return to support our husbands and parents during the rainy season to farm* **(Female, March, 2023, Siriyiri).**

The above narrative account signifies the significance of migration as livelihood and income diversification strategy of households (Musa-Surugu et al., 2018; Ober and Sakdapolrak, 2017; Stark, 1991), as farming households lack irrigational infrastructures to boost dry season farming (Owusu et al., 2021). Moreover, it should be noted that majority of the women lack access to land to farm on their own, as the finding in chapter four reveals. This assertion is similar to the postulations of Foresight (2011) and Vinke et al. (2020) that migration is considered a viable safety net of families battling climate risks and vulnerabilities in order to sustain livelihoods. This phenomenon mirrors the relationship between human agencies and structures (Giddens, 1984). Thus, even though environmental and climate structures disrupt livelihoods, some

household members are able to use migration as a strategy to temporarily deal with the situation (Holt-Jensen, 1999; Leach et al., 1999).

In addition to the movement to rural settlement and the regional capital, migrants also moved to other urban areas apart from the districts and regional capitals. The survey showed that 14.9% of the out-migrants across the study areas moved to urban areas/settlements (i.e. another town or city but not the regional or the district capitals). The proportion of female migrants (16%) who moved to such destinations was slightly higher than that of the male migrants (14.7%). At the district level, the survey showed that relatively, Jirapa Municipality had more people (16.8%) migrating to urban settlements than migrants from the Wa West District (12.8%). The gender dynamics slightly put the proportion of male migrants from the Jirapa Municipality (17.9%) who moved to the said destination ahead of their counterparts in the Wa West District (11.1%). In another perspective, whereas nearly one-fifth of the female migrants from the Wa West District (19.5%) moved to urban settlements as their preferred destinations, a little above ten percent of their colleagues from the Jirapa Municipality (13.2%) also moved to the same area. Regarding the relationship between gender and destination choices of migrants in the two major study areas, the chi-square analysis revealed a significant association between the variables ( $p=0.003$ ). This signifies that more females than males migrated to the said destination. These dynamics may be attributed to the fact that, while more women are migrating to the south as a result of Kayayei and cashew nut picking, the men are rather migrating to rural areas for both farm labours work and illegal mining (galamsey) activities (Teye et al., 2021).

Although current migration trends in the region show that people are now moving to urban towns in the Savannah, Upper East and Northern regions (Fielmua, 2017; Teye et al., 2021), majority of the movements are towards southern Ghana in cities such as Kumasi, Techiman, Kintampo,

Obuasi, Prestea, Tarkwa, Accra etc. (Fielmua, 2017; Tanle & Kyereme, 2014; Van der Geest, 2011). This assertion was confirmed during interviews when farmers were asked to identify the various destinations in the south to which migrants moved. An opinion leader reported that migrants traverse the entire southern Ghana starting from the Bono and Ahafo regions to Western and Western north regions. Here is what the participant said:

*They move across the south region. Some are in the Ashanti region, Bono East, Ahafo and Western (Shefi) area. They are just dotted across the regions (Opinion leader, March, 2022, Siriyiri).*

The respondent, however, revealed that the introduction of cashew nut cultivation has made the Bono and Ahafo regions the current preferred destinations not only for young women but also for older women. Women are paid through planting and picking of cashew nut after harvesting. Participants indicated that most of the migrants return with the monies made and or food items like cereals. This reflects the situation where households adopt migration as a coping strategy to relieve them of the impacts of climate change and its stressors (Call & Grey, 2020). The assembly member of Siriyiri, one of the study communities recounted that:

*As I'm talking now, the young ladies have joined the queue and the reason being that, I understand around Techiman and Sunyani areas they are into this cashew farming. So within this period I understand they always need laborers to pick cashew nuts hence, the women including the older ones go there for this activities. Most of them are there already and return when they get their money (Opinion leader, March, 2022, Siriyiri).*

As the above narrative account shows, households and individuals utilise their networks (family and friends) as agencies to scout for these destinations where alternative livelihood opportunities are available. Largely, this phenomenon has significantly shaped outward mobility of household members, as Awumbila (2014) and Teye (2017) found how migrants from the north heavily relied on their social networks to move to the various destinations in the south. Though historical antecedents have proven that the north-south migration trend has provided strong social networks

in the south (through family and friends) that facilitate subsequent migration of potential migrants (Awumbila, 2014; Fielmua, 2017; Tanle, 2014; Teye et al., 2021), it is surprising to see relatively smaller proportion of migrants moving there. Part of the reason for this phenomenon could be attributed to factors including the impact of COVID-19, given that at the time the survey was conducted, the pandemic was still causing havoc in the south and attracting varied degrees of restrictions (GSS, 2020), hence, potential migrants could not realise their aspiration to migrate to the south. Again, potential migrants' aspiration to migrate to the south could be stifled by the lack of financial resources and other personal factors (Awumbila, 2014; Jarawura and Smit, 2015). Nonetheless, a number of the participants in the qualitative study maintained that migration to southern Ghana was on the increase, as irrespective of the circumstances, migrants believed that chances of securing jobs in the south is higher and more realistic than in the north. In sharing her opinion on the phenomenon, a participant stated in an interview that:

*We still have more people moving to the south to look for jobs. When they go and see land that is good for farming, some do farm. We think agriculture activities can be easier and profitable down south than up north here. Others also find themselves menial jobs.... (Female, 30 Years, March, 2022, Siiru).*

As their main economic activity, participants recounted that farming in the south is more rewarding than up north due to factors such as fertile lands, favourable climatic conditions (giving rise to double farming seasons) and ready market for agriculture products (MoFA, 2018). The above narration depicts the extent to which climate affected households deploy their agencies (migration) to deal with the effects of environmental structures on their livelihoods (Holt-Jensen, 2009).

### **5.5 Migration as a coping strategy to deal with the adverse effects of climate change**

To avert the negative impact of climate change and variability on livelihoods of agrarian households in particular, several short-term measures are employed. These short-term measures,

according to Eriksen (2005), are referred to as coping strategies or activities. These measures are only intended to reduce households' contact with anticipated or experienced climate impacts (Kate et al., 2012). Consequently, Ellis et al. (2000 cited by Antwi-Agyei, 2021), suggested in a chronological order, five possible coping strategies that local farmers may adopt. These strategies include searching for other income generating avenues, relying on mutual commitments (for instance, seed and labour sharing), minimising household size via short-term migration, reducing the quantity of mobile capitals (for example, livestock), and selling of immovable capitals like land. The authors further posited that, in the absence of other coping mechanisms, permanent migration is considered as an option (Erickson et al., 2000).

Given the precarity that confronts farming households in the Upper West Region, as shown by findings from the previous chapter of this study and other studies (Aniah et al., 2016; Antwi-Agyei, 2021; Derbile et al., 2022; Fielmua, 2017; Teye et al., 2021), short-term and seasonal migration provides a temporary means of coping (Kluger et al., 2020). In the study communities, respondents reported that due to the effects of climate related hazards such as long periods of drought and fluctuating rainfall (which largely culminate into a single farming season) on their farming activities which further trigger socioeconomic vulnerabilities, they are usually left with no other choice than to migrate. During the survey, the study sought to find out from the respondents the extent to which migrants move seasonally (internal or international). Responses gathered from the respondents are presented in Table 5.2. Most importantly, it should be noted that the proportions in the table represent the migrant population but not the sampled respondents in the study.

**Table 5.2: Proportion of migrants that embarked on seasonal/short term and permanent migration**

Migration/mobility types	Wa West			Jirapa			Overall		
	Male N=162	Female N=41	All N=203	Male N=179	Female N=53	All N=232	Male N=341	Female N=94	All N=435
	%	%	%	%	%	%	%	%	%
Permanent abroad (5 years)	0.6	0.0	0.5	1.1	0.0	0.9	0.9	0.0	0.7
Permanent internal migration (5 years)	46.9	53.7	48.3	42.5	52.8	44.8	44.6	53.2	46.4
Seasonal/short-term movement	45.1	39	43.8	54.7	43.4	52.2	50.1	41.5	48.3
Daily commute to work, school etc.	5.6	7.3	5.9	1.1	1.9	1.3	3.2	4.4	3.4
Return migration	1.9	0.0	1.5	0.6	1.9	0.9	1.2	1.1	1.1
Total	100	100	100	100	100	100	100	100	100
Chi-squared	(4) = 1.7645 p = 0.779			(4) = 3.6080 p = 0.462			(4) = 3.3833 p = 0.496		

**Source: Fieldwork, 2020**

The survey data, as reported by the respondents across the entire study communities indicated that migrants mainly embarked on seasonal or short-term and permanent migration within the country. Seasonal/short-term migration subsequently emerged as the dominant form of migration embarked upon by nearly half (48.3%) of the out-migrants population. The overall gender distribution revealed that, the proportion of males (50.1%) who migrated seasonally outstripped their female (41.5%) counterparts who adopted this form of migration. The data at the district level also showed some level of disparities. While more than half of the outmigrants from the Jirapa Municipality (52.2%) moved seasonally, a little over forty percent of the out-migrant population from the Wa West District (43.8%) also used this form of migration as a strategy to cope with climate change disturbances. The gendered dimension at the district level showed that, more males from the Jirapa Municipality (54.7%) and the Wa West District (45.1%) than

females from same districts (43.4% and 39% respectively) embarked on seasonal/short-term migration. Additionally, the chi-square test ( $p=0.496$ ) showed that the relationship between gender and seasonal migration in the two study areas was statistically insignificant. This insignificant association between the variables implies that seasonal migration is a major coping strategy for majority of the people in the districts. During the interviews, participants reported that in the dry season where farming activities are limited to few farmers who practice irrigation farming, majority owing to the lack of non-farm livelihoods adopt seasonal migration or short-term migration (between three to four months) as a means of coping with climate-related hazards. Reporting this phenomenon, a participant asserted that:

*What normally happens here is that, at the end of the farming season like around November- December, where all harvesting is done in this community, by January, most of the young men move out to the southern Ghana in search for jobs because within that period there is no work here, so they go there to work and make money and gather food items to support their families upon return* (**Opinion leader, March, 2022, Siiru**).

The above account confirms the narrative that vulnerabilities among farming households in arid and semi-arid areas are partly caused by a combination of climatic and socioeconomic factors such as lack of jobs (Antwi-Agyei et al., 2019; Bawakyillenuo et al., 2016; GSS, 2017; Owusu and Teye, 2015; Schroth et al., 2016). The outmigration of farmers, especially young men in search of jobs as a strategy to deal with climate and socioeconomic challenges resonates with the perspective of the sustainable livelihood approach where the poor adopts a number of livelihood strategies to reduce household vulnerabilities (DFID, 2005).

In addition to this, a number of interview participants shared their experiences to confirm the importance of migration as a coping strategy (Kluger et al., 2020). A case in reference is a 40-year-old Nagba, who is a maize farmer but usually migrates to southern Ghana during the dry season. According to him, maize farming has been his only source of livelihood by which he

meets socioeconomic needs of his family. He, however, reported that due to the lack of irrigational facilities, dry season farming eludes him. To cope with household needs, he engages in short-term or seasonal migration to discover wage-earning work or undertake menial jobs. His case is presented below:

*For several years, maize farming has been my main source of livelihood. I'm able to provide basic needs of my family through the income I make from farming. However, during the dry season it becomes very difficult for me to continue to provide for my family, as the proceeds I gather from the previous farming season does not last up to the next farming season. And I am not able to farm during this season because I do not have access to irrigation facilities. In order to sustain my family, I travel to Kumasi, where I have a couple of friends, who assist me to acquire casual labour work. I usually stay for four months and return back home to farm when the rains set in. But while at the destination, I am able to send money home for the upkeep of my family (Nagba, 40 Years, March, 2022, Pinyiri).*

The case above portrays the significant role seasonal migration plays in helping farming households to cope with the socioeconomic vulnerabilities, which are primarily caused by the impact of climate change on their livelihoods (crop farming). This finding mirrors the tenets of the conceptual framework, where climate hazard (drought) shapes the vulnerability context (loss of livelihoods) compelling households to engage seasonal migration as a livelihood strategy to deal with the vulnerability to arrive an outcome—remittances and improved household needs (Carney et al., 1999). Mr. Nagba's case is similar to the finding of Call and Gray (2020) in Uganda, where short-term/seasonal migration in response to excessive heat did not only become a livelihood modification strategy but also reached an apogee. In a similar perspective, households located in dry areas in Ethiopia employed seasonal migration during drought as a strategy to diversify livelihoods, having exhausted all possible strategies including the sale of assets and reducing the consumption of food (Meze-Hausken, 2000). This phenomenon fits well into the concept of duality of structure (Holt-Jensen, 2009; Leach et al., 1999). That is, though

environmental structures (dry season) adversely compromised household livelihoods, farmers were able to deploy seasonal migration (particularly through the remittances that are sent for the upkeep of relatives left behind) as their agency to minimise the socioeconomic challenges triggered by climate change and its impacts. The case also showed that migrant social networks are instrumental in shaping outmigration of potential migrants in devising to cope with climate perturbations (Awumbila, 2014; King, 2012; Teye et al., 2019).

### **5.6 Migration as an adaptation strategy to deal with the adverse effects of climate change**

As an adaptation strategy, migration offers households and individuals the opportunity to adapt proactively and or reactively to the increasing impacts of climate change on their livelihoods. Migration, which in this sense is more long-term/permanent than seasonal/short-term, is considered a proactive form of adaptation as it involves long-term planning horizon and higher levels of agency (Vinke, 2019). The phenomenon which is usually voluntary, is employed as a strategy to adjust to actual or expected effects of climate change. Generally, migration in this context is adopted as a preventive mechanism. Moreover, it is also considered an adaptive capacity of households in responding to climate and environmental perturbations. Although households' adaptive capacities are shaped by awareness creation and training, provision of technological and economic resources (Abdul-Razak & Kruse, 2017), migrant remittances are considered a significant medium of adaptation for smallholding rural farmers (Musah-Surugu et al., 2018). According to de Haas (2007 cited in Gemmene & Blocher, 2017), migrant remittances can help in building the resilience of families left behind in agriculture, and also play key role in the modification of rural economies (Barnett & Webber, 2010). In this light, this section focuses mainly on the receipt and use of remittances as a major means of in-situ adaptation to the negative impacts of climate change by left behind household members.

### 5.6.1 Households receipt of remittances

Under this sub-section, the study sought to ascertain whether households or respondents received remittances or not. Household heads or respondents were asked if within the past 12 months they had received remittances of any form (money, food, farm inputs etc.) from migrants, of which they were only expected to answer ‘yes’ or ‘no’. There were multiple responses as migrants could remit both members of their households and non-migrant household members. As a result, the total sampled respondent for each major study area was used and not only the number of migrant households. The responses are presented in table 5.3 below:

**Table 5.3: Proportion of households that received remittances within the past 12 months**

Household received remittances	Wa West		Jirapa		All	
	N	%	N	%	N	%
Yes	67	44.7	73	48.7	140	46.7
No	83	55.3	77	51.3	160	53.3
Total	150	100	150	100	300	100
Chi-square (1) = 0.482 p = 0.487						

**Source: Fieldwork, 2020**

Concerning receipt of remittances, the quantitative survey from both study areas, as shown in Table 5, indicated that while majority of the respondents (53.3%) claimed not receiving any form of remittances from migrants, approximately 47% of the respondents reported to have received remittances. Similarly, the distribution at the respective districts also showed that the Wa West District (55.3%) had slightly more respondents than Jirapa Municipality (51.3%) who did not receive any form of remittances (food or money) within the past twelve months. On the contrary, the proportion who claimed to have received remittances were more in the Jirapa Municipality (48.7%) than the Wa West District (44.7%). The association between the receipt of remittances

and respondents from both study areas was statistically insignificant as proven by the chi-square test ( $p=0.487$ ). This means that not much difference exists between the proportions of respondents who received or did not receive remittances. For non-receipt of remittances, for instance, the test implies that the phenomenon is a major issue experienced in both study areas. This may be attributed to a plethora of factors including but not limited to the kind of jobs most migrants are engaged in, and the relatively poorer (rural) destinations (with very limited economic opportunities) some migrate to, as these two variables play pivotal role in whether or not migrants will remit home (Teye et al., 2019). This assertion is supported by findings from the interviews, as a return migrant expounded that some migrants are not able to remit home because it is extremely difficult to settle down about job acquisition and other socioeconomic constraints.

This is what he said:

*It is not easy out there, some always travel and find it difficult to settle down especially when they don't get jobs. Those type of people cannot take care of themselves not to talk of supporting others through remittances... There are others who have settled there permanently but they don't have anything to show off, hence do not remit back home. (Male, 46 Years, March, 2022, Pinyiri).*

Although previous discussion has shed light on households' use of seasonal migration as a safety net that enhances their capacities to minimise the impacts of climate change on livelihoods, challenges at the destinations that migrants have to grapple with were not considered. The above narration, however, explicates that migrants' desire to have the 'good life' (de Haas, 2021), and be able to remit home is demotivated by their inability to secure jobs at the destinations. This highlights Sibeon's (2004) postulation that societal structures (socioeconomic structures) constrain or enhance the exertions of human agency (remittances) farmers deployed to deal with the climate change and its impacts on livelihoods.

While it is possible that households that received remittances had migrants who were/are working, other migrants may not be engaged in any income generating activities but they still have to remit in order to partly meet their responsibilities at home. For instance, a migrant parent who has left behind spouse and children will, irrespective of the circumstances he finds himself, remit back home. This is similar to the findings of Abutima (2019) in a study that looked at the benefits left-behind families receive after spousal migration. The author disclosed that female left-behind spouse received higher remittances than male left-behind spouse did (Abutima, 2019). Giving his views an interview participant revealed that:

*As for those that are married, no matter what they are forced to send money for the upkeep of their wives and children. These days that mobile money has made transfer of money very easy, they just sit there and send it to them through mobile money (Male, 37 Years, March, 2022, Siiru).*

The above quotation is evident of the efficacy of patriarchal social norms in the study areas where husbands or males are known for providing households needs (Teye et al., 2022). It was also reported that the destinations migrants move to determine the kind of remittances they send home. They opined that migrants who moved to destinations not far from home sent food and other items, while those who migrated to distant destinations, due to the difficulty in sending any in-kind remittances, send money through mobile money transfer system. This revelation is in line with the various kinds of remittances as revealed in existing literature. The flow of remittances from migrants to families whose livelihoods are compromised with the adverse effects of climate change include financial, social and in-kind (Pickbourn, 2016; Szabo et al., 2022; Teye et al., 2023).

### 5.6.2 Uses of remittances

In rural settings, migrant remittances have diversely been used to shape household challenges, particularly for consumption purposes during times of negative climate impacts (Asafo-Agyei, 2021; Pickbourn, 2016; Teye et al., 2023). To justify that remittances were used for the purposes of building adaptive capacity of recipients, it was imperative that recipients of the said remittances identified how and for what they were used. Respondents were asked to indicate whether the remittances received were mainly, partly or not at all used on the following; food, education of household children, healthcare, farming (inputs and livestock), house construction, clothing, donation and other items. However, respondents reported that sometimes the migrants decide on what the money sent should be used for while they (the migrants) are away. It should be clarified here that, since a recipient could use remittance received on multiple items, the proportions in table 5.4 indicate multiple responses from the respondents.

**Table 5.4: Uses of remittances**

Uses	District		Total
	Wa West	Jirapa	
	N = 67	N = 73	N = 140
	%	%	%
<b>Food</b>			
Mainly	16.4	11.8	14.0
Partly	74.6	78.1	76
Not at all	9	11	10
Total	100	100	100
Chi-square (2) = 0.962 P = 0.618			
<b>Education</b>			
Partly	53.7	61.6	57.9
Not at all	46.3	38.4	42.1
Total	100	100	100
Chi-square (1) = 0.8970 P = 0.344			
<b>Healthcare</b>			
Mainly	6	5.5	5.7
Partly	79.1	71.2	75
Not at all	14.9	23.3	19.3
Total	100	100	100
Chi-square (2) = 1.5701 P = 0.456			
<b>Farming - input/irrigation</b>			

Mainly	3	8.2	5.7
Partly	37.3	58.9	48.6
Not at all	59.7	32.9	45.7
Total	100	100	100
Chi-square (2) = 10.5269 P = 0.005			
<b>Farming – Livestock</b>			
Partly	14.9	19.2	17.1
Not at all	85.1	80.8	82.9
Total	100	100	100
Chi-square (1) = 9.4448 P = 0.508			
<b>House construction</b>			
Mainly	0	4.1	2.2
Partly	22.4	28.8	25.7
Not at all	77.6	67.1	72.1
Total	100	100	100
Chi-square (2) = 3.8390 P = 0.147			
<b>Clothing</b>			
Partly	-	100	100
Total	-	100	100
<b>Donation</b>			
Mainly	1.5	1.4	1.4
Partly	32.8	42.4	37.9
Not at all	65.7	56.2	60.7
Total	100	100	100
Chi-square (2) = 1.3796 P = 0.502			
<b>Others</b>			
Mainly	1.5	0	0.7
Partly	40.3	39.7	40
Not at all	58.2	60.3	59.3
Total	100	100	100
Chi-square (2) = 1.1175 P = 0.572			

**Source: Fieldwork, 2020**

On the manner in which remittances were used to acquire household needs, the quantitative survey enlightens that, while majority of the respondents (76%) across the study areas claimed to have expended part of their remittances on food, only 14% spent their remittances mainly on the same item. However, exactly 10% did not spend a pesewa of their remittances on food. Part of the reasons for this experience could be hinged on the fact that some migrants, aside from sending financial remittances also send foodstuff to left behind household members, or sometimes they carry along food as they return home during the farming seasons (Tapsoba et al.,

2019). Recipients of such item may not consider spending remittances on food. Additionally, household members who were fortunate to have good harvest may prefer to save financial remittances received instead of spending it on food. The district level analysis concerning partial use of remittances on food displayed that, Jirapa Municipality (78.1%) had slightly higher respondents who spent portions of their remittances on food than their counterparts who did same in the Wa West District (74.6%). The difference between these variables is further proven by the chi-square test ( $p=0.618$ ) as statistically insignificant across the the two main study areas. This means that it is a common experience for relatives left-behind to spent remittances received on food and other household socioeconomic needs in the Wa West and Jirapa Municipality. The finding confirms a study conducted by Teye et al. (2023), where local farmers mainly spent their financial remittances on food. It emerged during the qualitative study that remittances are spent majorly on the general upkeep of households. The case of a 52-year-old Fati, who regularly receives remittances from her two migrant children in the south, sheds light on how relatives left-behind use remittances:

*I have two children who have migrated to Kumasi and are working. But I am here with three other children who help me to farm maize and groundnut, and are students as well. However, drought has always had a negative toll on my crops resulting in crop failures. It is always difficult for me at such times as I run out of food and money. But thankfully, my children in the south send me money on my phone during such difficult times. Generally, I spend the money on food, buy medicine, pay their siblings school fees and purchase seeds and fertilisers. So I do not feel the brunt of climate change that much. These children have really been supportive (Fati, March, 2022, Siriyiri).*

The case above is consistent with existing literature on the phenomenon across rural communities in developing countries particularly the sub-Saharan Africa. For instance, a study conducted by Banerjee et al. (2017) in flood-comprised places in India revealed that majority of households spent remittances received on education, food and healthcare. Likewise, an FAO

sponsored study conducted on climate-induced migration and rural adaptation in parts of Eastern and Northern Africa revealed that poor households in rural communities regularly preferred to spend remittances on immediate everyday needs prior to meeting education needs and acquiring farming inputs (Rignall, 2016; Szaboova, 2023). Given the place of basic household needs including food in climate change adaptation (Banerjee et al., 2017; Musah-Surugu et al., 2018), it can be established that despite the influence of climate hazards on livelihoods, the affected farmers used migrant remittances as a livelihood strategy to cope with climate change disturbances (Carney et al., 1999).

Given the significant role farming input plays in climate change adaptation (Szaboova, 2023), it is imperative to learn from the study the mode in which households spent remittances on such item. The quantitative survey revealed that almost half of the respondents (48.6%) from both districts stated using a portion of their remittances on farming inputs. Whereas only 5.9% of the respondents expended their remittances mainly on farming inputs, approximately 46% claimed not spending a dime of the amount received on farming inputs. This is alarming considering that almost half of the remittance-receiving population are involved. The distribution at the district level, according to the data, indicated that the phenomenon (non-use of remittances on farming inputs) was more prevalent in the Wa West District (59.7%) than the Jirapa Municipality (32.9%). This mirrors the statistically significant association between the respondents and non-use of remittances on farming inputs across the study areas shown by the result of the chi-square analysis ( $p=0.005$ ). The proportion who did not spend their remittances on farming inputs may be attributed to the combined effects of high input (fertiliser, seeds, chemicals and irrigation facilities) prices and the amount of remittances received (Banerjee et al., 2017). During the interviews, a participant revealed that remittance-receiving households hardly spent on farming

inputs. According to him, some recipients only spend remittances on farming inputs when senders who could not return to farm during the rainy season instructed them:

*Yes, those that are not able to return during the farming season to engage in farming send money to relatives left-behind that should be used to plough and also buy fertiliser and other agrochemicals. Yeah, they send money for those things (Female, 38 Years, March, 2022, Kunzokala).*

While this phenomenon may prove beneficial to only remittance-receiving households who were instructed as such, the reluctance of others to expend remittance on farming inputs could constrain the purpose of adopting migration as an adaptation to climate change (Adger et al., 2018; McLeman, 2018; Vinke et al., 2021). This is because those who migrate during the dry season do so with the intention to earn an income through menial jobs to enhance their capacity to acquire fertilisers and other relevant farming inputs (Antwi-Agyei et al., 2021).

Another important dynamics revealed by the study in connection with respondents who did not use their remittances at all is that, a greater proportion of the recipients (82.9%) from the major study areas decided not to spend remittances received on livestock farming. The dynamics at the respective districts showed that Wa West District (85.1%) had slightly higher respondents relative to the Jirapa Municipality (80.8%) who repudiated to use remittances for livestock farming. The chi-square test ( $p=0.505$ ) found no significant difference between the respondents and non-use of remittances on livestock farming across the two major assemblies. This insignificant difference communicates the degree of unwillingness of households to invest remittances in livestock rearing in the study areas. Findings from the interviews validate these results. When asked whether remittance-receiving households engaged in livestock rearing with their remittances, a participant stated that this practice is not common. According to her, though

keeping livestock and poultry have proven beneficial, they are rather counting their losses due to high livestock mortality and theft. On these phenomena, participants narrated that:

*Our livestock have been dying. The livestock mortality is so high here. In those days, almost every household used to rear pigs, but if you check in this community now you hardly see pigs again. You will start rearing then all of a sudden pig mortality will set in, and before you realise, all the animals will go condemn. Agriculture Extension Officers that came to examine the animals revealed that they are suffering from certain diseases. [...]. It's very difficult to keep livestock again, because by the time you realise you will lose all. As a result, I do not think anybody would invest in livestock farming with the meagre money they received from migrants (Female, 38 Years, March, 2022, Kunzokala).*

The quotation above reveals that but for the diseases that triggered the death of animals, livestock rearing could have served as an important livelihood diversification strategy and as a coping or survival mechanism for farming households. Meanwhile, Tetteh et al. (2019) asserted that rearing livestock either on a large-scale or small-scale will not only provide a temporary means of coping but also serve as a medium of insuring farmers against crop failure. Recounting the possible factors that may account for livestock theft, it emerged that Fulani migrants have always been culprits in not only animal theft but also raping women at gunpoint. Attempts to get them arrested and arraigned in court proved futile, as the Fulani chiefs connived with the police and made the culprits go free. An opinion leader revealed that:

*Even three days ago in Gbare they arrested 2 Fulani guys who stole 2 big goats. The next thing is you hand them over to the police. And then the Fulani also have their own structures within Jirapa. They have the Fulani Chief who steps into the matter. If it is about money, they have it. Once they sell one or two cows, they are able to sort out the police and that ends the matter. So you can't go far before you coil back. Sometimes, they rape people's wives at gun point and they are freed. Everybody is aware. It's not that we are not aware, but who bells the cat? The police will have their own way of covering up once they are sorted (Opinion leader, 35 Years, Male, March, 2022, Kunzokala).*

On the account of the fact that remittances received were scarcely spent on livestock rearing due to its mortality and theft, it can be contended that the phenomenon did not in any significant manner influence households adaptability to climate change and its impacts. This could further exacerbate the vulnerability of households as the livelihood strategy adopted (seasonal migration) failed to yield the desired outcome (Carney et al., 1999).

### 5.7 Climate-induced Immobility

Although the discussions so far revealed that several people have migrated from the region to various destinations in response to the combined effects of climate change and other socioeconomic and political factors, several evidences posit that some persons equally affected by the same factors who could have also moved rather stayed in the communities. These people have diversely been referred to as ‘immobile people’, ‘stayers’, ‘left-behind’ and ‘trapped population’ (Mata-Codesal, 2018). However, according to Teye et al. (2022), these forms of immobility are categorised into involuntary immobility and voluntary immobility. While involuntary immobility is the process where people need to move but lack the capacity to move, voluntary immobility is a situation where people decide to stay behind even though they have the capacity to move (see Foresight, 2011). To ascertain the reasons that accounted for the immobility of some household members, it is imperative to, first, find out the proportion of household members who wanted to migrate but did not. The results are illustrated in Table 5.5 below.

**Table 5.5: Proportion of household members who wanted to migrate but did not do so**

Migration intention	Wa West	Jirapa	Overall
	150 (%)	150 (%)	300 (%)
Some household members wanted to migrate	26 (17.3)	31 (20.7)	57 (19)
No member wanted to migrate	114 (76)	107 (71.3)	221 (73)
Don't know	10(6.3)	12(8)	22 (7.3)
Chi-square (1) = 8.6626 P = 0.013			

**Source: Fieldwork, 2020**

The study disclosed, as displayed in Table 5.5 that, nearly (20%) of the respondents from both assemblies had household member who wanted to migrate but did not do so. The proportion of respondents in the Jirapa Municipality (20.7%) that had household members who aspired to migrate but did not were slightly more than their counterparts in the Wa West District (17.3%). The chi-square test ( $p=0.013$ ) shows a statistically significant relationship between respondents from the two main study areas and migration intention (household members who wanted to migrate). When respondents were asked to identify possible reasons for which some household members could not realise their migration aspirations, they revealed among other factors, including obligation at home, waiting for the right opportunity, lack of funds and others. The details are summarised in Table 5.6

**Table 5.6: Reasons for the non-migration of household members who wanted to migrate**

Reasons for non-migration	Wa West			Jirapa			Overall		
	Male N= 22	Female N= 4	All N=26	Male N=20	Female N=11	All N=31	Male N=42	Female N=15	All N=57
	%	%	%	%	%	%	%	%	%
Obligation at home	59.1	50	57.7	45	27.3	38.7	52.4	33.3	47.4
Waiting for the right opportunity	22.7	25	23.1	-	-	-	11.9	6.7	10.5
Lack of funds	18.2	0.0	15.4	50	72.7	58.1	33.3	53.3	38.6
Others	0.0	25	3.8	5.0	0.0	3.2	2.4	6.7	3.5
Total	100	100	100	100	100	100	100	100	100
Chi-squared	(3) = 6.2833 p= 0.099			(3) = 1.7574 p = 0.415			(3) = 2.8587 p= 0.414		

**Source: Fieldwork, 2020**

Among the reasons advanced for the immobility of some household members, the survey data showed that nearly half of the respondents (47.4%) across the entire study areas reported that some household members' migration aspirations were hindered by their obligations at home. Similarly, the district level distribution indicated that the Wa West District (57.7%) had a higher percentage of respondents than the Jirapa Municipality (38.7%) with potential migrants whose

migration aspirations were disrupted by their obligations at home. The overall gender distribution also discloses that, greater proportion of the male respondents (52.4%) had household members whose migration was affected negatively by this phenomenon exceeding their female counterparts (33.3%) with household members suffering the same fate. The gender analysis at the respective districts also revealed that the proportions of male (59.1%) and female (50%) respondents in the Wa West District whose household members could not migrate due to obligations at home surpassed their male (45%) and female (27.3%) counterparts in the Jirapa Municipality. The chi-square test ( $p=0.414$ ), does not show any significant statistical difference between the responses of male and female respondents who reported non-migration of some household members caused by obligations at home across the two study areas. This implies that obligations at home is a dominant obstacle to people's aspiration to move. According to Okrah (2017), Teye et al. (2022) and Zaami (2020), the responsibilities of men and women as parents, breadwinners, landlords, chiefs and community leaders and caregiving largely stifle their ability to migrate. In Ghana, for instance, customs demand that young adults take care of their aged parents as a way of reciprocating same care they received (Oppong, 2006). This proves challenging to these young adults as some may need to care for their own children as well. According to the respondents, this is one of the major obligations that holds potential migrants from moving out of the communities. In sharing her experience, a 48-year-old woman revealed that, considering the prevailing climate effects on farming, which has led to food shortages and poverty, she contemplated migrating to the south. However, leaving behind her children to embark upon migration is a difficult puzzle as there will be no one to take proper care of her children. This is what she said:

*The impact of climate change on my crops has been severe this year. As a result, hunger and poverty have also intensified. I wish I could also travel to the south, but I have*

*children to take care of so I cannot move. The system is hard so if I leave it is possible they will not get all their needs and they are schooling as well. People worry leaving their families behind when they leave and that is one reason holding people back* **(Female, 48 Years, March, 2022, Siiru).**

The above narration indicates that although climate change and its trickle down effects particularly on food security and poverty may compel people to migrate, some household members are unable to move due to their quest to fulfill obligations at home. Teye et al. (2022) and Foresight (2011) referred to this phenomenon as involuntary immobility. The ideals of constraining forces of structures posited by Sibeon (2004, p. 53), in the theory of structuration feature in this study, as societal structures and norms (obligations at home) constrain the capabilities of individuals (adopting migration as an adaptation strategy). Several others also expounded that property and owners of farmlands fear the possible takeover of their properties while they are away hence, their resolve to stay back and protect their properties. This was reported by a participant in an in-depth interview in one of the study communities:

*One thing that prevents people from migrating is; sometimes the way you leave your people back home and travel and upon your return your farmlands and other properties have been taken over by others. So, it discourages people from traveling or migrating outside ...* **(Male, 30 Years, March, 2022, Pinyiri).**

This narration resonates with the finding of Grolle (2015) in the Sahel region of Nigeria, where several farmers seized the opportunity of the outmigration of other household members to the Savanna zones to protect their farmlands. This implies that if they had migrated their farmlands would have been lost to these migrants. Consistent with the tenet of the structuration theory, farmland and property occupation by other household members served as the constraining forces to outmigration of potential migrants (Sibeon, 2004, p. 53).

The next important reason for which some household members who wanted to migrate but did not was the lack of funds. This reason, according to the overall data, was reported by 38.6% of

the respondents. The proportion of female respondents (53.3%) that reported this incident was higher than the proportion of male (33.3%) across the major study areas. When differentiated by districts, the data revealed that while majority of the respondents in the Jirapa Municipality (58.1%) reported lack of funds as the reason for which some household members who aspired to move but could not, less than twenty percent of the respondents from the Wa West District (15.4%) reported it. The gender perspective with respect to the districts indicated that, whereas almost three-fourth of the respondents from the Jirapa Municipality (72.7%) who reported immobility of some members of their households due to lack of funds were females, half of the male respondents (50%) also recounted the same incident. The Wa West District, on the other hand, had nearly twenty percent of the male respondents (18.2%) with no female respondent (0.0%) reporting lack funds as a hindrance to some household members who wished to migrate. The result of the Chi-square analysis ( $p=0.414$ ) shows that there is no statistical significant association between gender of respondents and lack of funds. That is, there is no difference in the male and female responses on non-migration due to lack of funds in both Wa West and Jirapa. Discussions from the qualitative study shed more light on the survey findings. During an in-depth interview, an opinion leader enlightened that lack of funds in this context alludes to potential migrants' inability to raise even transport fares to migrate. The views of the participant is captured in the following statement:

*For those who want to move but are unable to move, in the first place, getting the lorry fare alone is a problem. [...]. Sometimes they can't even get the lorry fare, unless they borrow or somebody (their galamsey masters) sends them the money, which they will work and pay for later (Opinion leader, 35 Years, March, 2022, Kunzokala).*

Despite the necessity placed on household members to migrate due to the precarious situation (loss of livelihood, hunger and poverty partly caused by climate change) that confronted local farmers, some were unable to migrate owing to the lack of financial resources. This finding

reflects the concept of involuntary immobility, as even though some household members needed to move but they lacked the financial resources to do so (Black et al., 2014; Foresight, 2011; Teye et al., 2022; Zickgraf, 2021). The phenomenon, more so, brings to perspective the postulation of structuration theory that, structures (lack of funds) can constrain human agency (migration as a strategy) employed to address the precarious situations partially caused by climate and environmental changes (Sibeon, 2004, p. 53).

### **5.8 Chapter conclusion**

This chapter examined how and the extent to which migration is used as a coping and an adaptation strategy to deal with climate change and its impacts. Analysis of the historical antecedents of climate related migration reveals that, migration has long been used as a coping strategy even before the colonial rule. For instance, movements in the pre-colonial era in search of fertile land for farming, to escape conflict and slave raiders, and in quest of pasture for livestock grazing (Goody, 1967; Jarawura and Smit, 2015; Lentz, 2006; Van der Geest, 2011), indicate that climate, environmental and political factors account for human migration. This confirms the minimalist perspective on the complex relationship between climate change and migration; which elucidates that outmigration of climate affected households is triggered by a multiplicity of economic, social, political, climate and environmental, demographic and cultural factors (Black et al., 2011; Boano et al., 2008; Foresight, 2011; Martin, 2017; McLeman and Smith, 2006). Similarly, in the post-colonial and post-independence eras, as agriculture livelihoods were adversely affected by variations in rainfall and temperature, coupled with structural adjustment programmes and other vulnerabilities, many people resort to migration (Afful, 2016; Oteng-Ababio, 2016; Tanle, 2014; Teye et al., 2020; Van der Geest, 2011).

The study shows that households continue to witness high incidence of outmigration, as more than half (63.7%) of the respondents had household members moving out. Though female outmigration is gaining some currency (Awumbila, 2014; Teye et al., 2019), male outmigration is still dominant (78.4%). This phenomenon is attributed to the fact that it is easier for males to secure menial jobs and to cope with challenges than females at the destinations (Abutima, 2019; Awumbila, 2014; Teye et al., 2019). Among the several reasons for which people migrated, the study discovered that economic reasons accounted for the outmigration of majority of the respondents (68%). That is, movement in search of employment opportunities (25.5%), moving for better opportunities or hustling (42.5%), and lack of work here (16.3%). Climate-related hazards such as drought and floods altogether accounted for the movement of only (1.6%) of the out-migrants population. Even though climate change may have insignificant direct impact on outmigration, its intricate bearing on outmigration is enormous. As the literature and findings from the previous chapters of this thesis have indicated, climate change adversely affects agriculture livelihood of households located in semi-arid regions thereby worsening socioeconomic vulnerabilities (Aniah et al., 2016; Antwi-Antwi et al., 2021; Baffour-Atta et al., 2022; Derbile, 2022; Hoffmann et al., 2020). Other scholars have posited that, to diversify loss of livelihood (which results in unemployment and increased household poverty), potential migrants move to destinations where unskilled migrants, particularly, engage in a number of menial jobs (Boas et al., 2019; Fielmua, 2017; Ribot et al., 2020; Vinke et al., 2020; Zickgraf, 2021). The study identified these menial jobs at the destinations to include head portering (kayayei), illegal mining (galamsey), and waged farm labour work ('paa'). On this account, it could be argued that the majority whose outmigration was driven by economic reasons could be linked to climate and environmental factors. Simply put, climate and environmental factors have implications for

economic migration. Nonetheless, what these studies do not explicitly explicate is whether potential migrants have the aspirations, capabilities, and social networks required for migration (de Haas, 2021; Massey, 2018). Similarly, as the conceptual framework shows, though climate change is shaping vulnerability of household through livelihood losses, farmers employ migration as a livelihood strategy to minimise the vulnerability for a positive livelihood outcomes such as improved household income partly through migrant remittances (Carney et al., 1999; DFID, 2005).

Concerning destinations of migrants, the research found that approximately 46% of the out-migrants moved to rural settlements. More males (49.9%) than females (29.8%) moved to this destination. This finding is contrary to existing literature, which posits that outmigration has been primarily from the north to the south (Abdul-Korah, 2011; Anarfi, 2003; Fielmua, 2017; Tanle, 2010; Van der Geest, 2011). However, as postulated by Aydemir and Duman (2021) that destination choices of migrants are shaped by the motive for migration, it emerged that the youth, for the same of reason of livelihood diversification, are engaging in illegal mining (galamsey) and as such, are increasingly moving to the sites that are located in rural communities. This phenomenon emphasises the efficacy of human agency in devising strategies to overcome structural constraints as Sibeon (2004) and Holt-Jenssen (1999) alluded. This, however, has not supplanted migration to urban centres, as the young adults in particular still find the south as a destination with better livelihood opportunities, even with farming inclusive.

In assessing how migration is used as a coping strategy to avert negative impacts of climate, it was discovered that nearly half of the out-migrant population (48.3%) moved seasonally as a temporary means of dealing with the awful impacts of climate change on their livelihoods. The literature, which aligns with the findings of this study enlightens that during the dry season,

farming communities located in arid and semi-arid regions suffer livelihood losses due to its climate-sensitive nature (see Aniah et al., 2016; Birkmann et al., 2022; Codjoe & Atiglo, 2020; Fielmua, 2017; Onwutuebe, 2019; Teye et al., 2021). During such seasons, farmers who lack access to irrigational facilities embark on short-term or seasonal migration to relatively shorter destinations where they find unskilled jobs that provide momentary means of sustenance. Majority if not all, having spent three to four months at the destinations, return back to the communities to engage in farming with the onset of the rainy season. Call and Gray (2020), in a similar account, revealed that farmers in Uganda adopted short-term or seasonal migration as a livelihood modification strategy in response to excessive heat. This situation mirrors the principle of duality of structures (Holt-Jensen, 2009; Leach et al., 1999), where in spite of the adverse impact of climate and environmental structures on livelihoods, households adopt migration as a strategy to deal with these structural constraints.

Pertaining to the use of migration as an adaptation strategy, the study discovered that migrant remittances played a pivotal role, as recipients either mainly (14.0%) or partly (76%) spent the amount received on food. Statistically, the study did not find any significant difference between households who spent the remittances mainly or partly on food across the two districts. This phenomenon confirms the impact of climate change on crop farming and food security. According to scholars, expending remittances on consumption (food) forms a major component of climate change adaptation and adaptive capacity building (Banerjee et al., 2017; Barnett & Webber, 2010; Gemmene & Blocher, 2017; Musah-Surugu et al., 2018). This claim is factual because as agricultural livelihood losses potentially result in hunger, food insecurity, and increased poverty (Antwi-Agyei, 2021; Baffour-Atta et al., 2022), migrant remittances provide a vital alternative means of survival for the recipient. To this end, there is the likelihood that

remittance-receiving households will be able to adapt in-situ. Despite exacerbating vulnerability of households (livelihood losses and food insecurity), the affected households use remittances as a financial asset and a livelihood strategy to reduce the vulnerability as well as improving food security (DFID, 2005). However, other studies have also shown that due to menial jobs unskilled migrants are engaged in their income levels are relatively low, hence remittances flow to relatives back home are not only irregular but also insufficient (Fielmua, 2017; Szaboova, 2023; Teye et al., 2023).

Finally, it was discovered that obligations at home (47.4%) and lack of funds (38.6%) were the major factors that hindered the migration of some household members. This finding reflects the structure-agency complexity posited by Sebion (2004, p. 53), where societal structures (obligation at home) and financial structures constrain the agency of households (using seasonal migration as a coping strategy) to reduce vulnerability of households. Having established that migration plays a crucial role in dealing with climate vulnerability, it could then be argued that involuntary immobile household members' vulnerabilities were exacerbated, as Teye et al. (2023) assert.

In view of the foregoing discussions, I perceive that, migration right from the olden days until now is a major livelihood diversification strategy for migrants and left-behind relatives. Moreover, it was learned that all other factors of migration have implications for economic migration. In this context, as climate change disrupts livelihoods, negative socioeconomic situations such as unemployment, hunger and poverty are triggered. Affected households and individuals in their bid to cope with these negative variables, are compelled to move in search of better economic or livelihood opportunities. Furthermore, migrant remittances are considered pivotal in the climate change adaptation postulations if migration is properly managed.

## CHAPTER SIX

### THE ROLE OF NATIONAL POLICIES AND LOCAL INSTITUTIONS IN SHAPING LIVELIHOODS AND CLIMATE-INDUCED MIGRATION

#### 6.0 Introduction

Migration has been identified as one of the response strategies to the adverse impacts of climate change on agrarian livelihoods (Hoffman et al., 2022; Teye et al., 2021; Vinke et al., 2022). The significant role the phenomenon plays brings to the fore the need to define its governance context. However, the intricate relationship between climate change and migration makes its governance through single and explicit policy and institutional approach challenging. To this end, some scholars have argued that shaping livelihood and adaptation needs of climate affected households and communities will have implications for migration (see Ellis, 2000; Hoffmann *et al.*, 2022; Schewel, 2020; Thiede & Gray, 2017). It is against this backdrop that this chapter examines the role of national policies and local institutions in shaping livelihoods and migration. The chapter is divided into two parts. While the first section presents the analyses and discussions on the role of national policies in addressing livelihoods and migration, the second part also analyses and discusses how local institutions shape household livelihoods and migration.

#### 6.1 The role of national policies in shaping livelihoods and climate-induced migration

Given that migration of individuals and households is linked to the loss of livelihoods (particularly agrarian) partly stemming from climate change impacts (Boas et al., 2019; Teye et al., 2021; Vinke et al., 2021), it is imperatively crucial that policies are formulated to bolster these two variables. However, it could be argued that if these policies positively shape livelihoods of households adversely affected by climate change, majority (usually adults) are

more likely to adapt in-situ and hence will scarcely migrate. On the contrary, individuals and household members particularly the youth will be more enthusiastic to realise their migration aspirations if the policies adversely affect livelihoods resulting in their inability to adapt in-situ to climate impacts. Even though policy has been defined by different scholars, this study, however, adopted the definition of Considine given here as, “an action which employs governmental authority to commit resources in support of a preferred value” (Considine, 1994). The adoption of this definition was informed by the author’s emphasis on the deployment of governmental authority majorly at the national level, in the allocation of resources to achieve a desired goal, as this study partly focuses on this area.

In shaping livelihoods of mostly rural households in Ghana, a number of development policies have and are still being implemented (Teye et al., 2022). Particularly, the northern part of Ghana including the Upper West region, has consistently witnessed the implementation of several development policies and programmes intended to address poverty triggered by a combination of social, economic, climate, environmental and political factors (Awuse & Tandoh, 2016). Historically, policies formulated and implemented did not so much address livelihood challenges in the north, rather largely widened the poverty and development gap between the north and the south resulting in the inception and the perpetuation of the north-south migration (Abutima, 2019; GSS, 2014). These policies are best described as the offsprings of the Colonial Development Policy (Bening, 2005), which concentrated development projects in the south thereby improving socioeconomic situations in the south to the detriment of the north (Bawa, 2019; Kwankye et al., 2009). In order to fill the lacuna created by this policy, other policies such as the National Reform Policy, which dates back to the 1950s, Agrarian Reforms under Kwame Nkrumah that established the state farms brigade systems under ‘Grow What You

East' Policy, Operation Feed Yourself Policy under Acheampong, which also encouraged Ghanaians to 'grow what they eat and eat what they grow', similar to the policy under Nkrumah. This policy transformed into immense irrigation schemes in the northern regions that resulted in increased food production (Acheampong et al., 2014). However, the success in food production was short-lived due to misappropriation, mismanagement and nepotism (Songsore, 2009). Another policy that brought massive socioeconomic development such as rural electrification, construction of new and expansion of existing health and education facilities and agriculture extension services in the north was during the Revolutionary and Liberal Reforms under President Jerry John Rawlings (GSS, 2003). Again, the creation of the Upper West Region in addition to the establishment of some district assemblies opened the north for development. The establishment of the University for Development Studies (UDS) and the Tamale Polytechnic also brought tertiary education to the door-steps of many which translated into development (Abugre, 1993). This policy, however, witnessed a downturn with the introduction of cash and carry in the health sector, facilities and user fees in the tertiary education and the removal of government subsidies on agriculture inputs, in addition to the reduction in government subvention to public companies and civil or public servants services which immensely adversely affected the poor (Goody, 2018). Other policies that emerged are the Ghana Poverty Reduction Strategy I and II under President John Agyeikum Kufour, which saw the implementation of programmes such as the Heavily Indebted Poor Countries (HIPC) and the Millennium Challenge Account (MCA) (Afful, 2016; Amoah, 2014). As these policies failed to fully address livelihood needs and to bridge the north-south development gap degenerating to increased outmigration and other socioeconomic conditions (Fielmua, 2017; Kuuire et al., 2013), new sets of policies have been formulated and implemented.

Within a space of about one and half decades the northern part of the country has again seen the implementation of other policy interventions meant to shape livelihoods, climate adaptation and migration. The current policies and programmes, among other things, include the Savannah Accelerated Development Authority (SADA), National Policy on Dams (One-Village-One-Dam), National Fertiliser Subsidy Programme and One-District-One-Factory. These policies are adopted and analysed in this study because they are tailored towards building livelihoods and adaptive capacities of climate affected households and subsequently shaping outmigration.

### **6.1.1 Savannah Accelerated Development Authority (SADA)**

In 2010, the Savannah Accelerated Development Authority (SADA) was established by an act of Parliament, Act 805, as a national policy strategy to address widening lacuna between the Northern Savannah Zones and the Southern Ecological Belt (SADA, 2016). The Zone comprised of the Upper West Region, Upper East Region, Northern Region, Northern Brong-Ahafo Region and Northern Volta. It has been established that the negative impacts of climate and environmental events on livelihoods are major contributing factors to the poverty and inequality experienced in the northern zone, which also partly account for incessant outward migration (Aniah et al., 2016; Antwi-Agyei, 2019; Awosi et al., 2018; Bawakyillenuo et al., 2016; Teye et al., 2021). The authority had three main objectives including the provision of strategic planning guidance to government as regards the implementation and review of an accelerated development strategy for the Northern Savannah Ecological Zone; mobilisation of human, financial and other resources for the implementation of the SADA; and co-ordination of existing and future development and related policies affecting the Northern Savannah Zone with a view to ensuring coherence in policy-making and implementation (SADA, 2016).

Tasked with the responsibility of designing and periodically reviewing a comprehensive development strategy for the Northern Savannah Ecological Belt, the authority in 2012 designed a number of strategic programmes that sought to transform livelihoods of households. These strategic programmes were accelerated agricultural production for small-holders, agro forestry, dry season farming, rural banking/finance and house project. Under the accelerated agricultural production for smallholders, SADA sought to adopt new strategies to modernise agriculture by way of a market based out-grower scheme where both the cultivation and marketing dimensions of agriculture were addressed at the same time. The 2012 agriculture program had four main components deemed most crucial for the authority. These were rain-fed cereals production, mango program, dry season farming which comprised of butternut squash for export, evaluation of irrigation potential of open water bodies and neglected irrigation projects, and guinea fowl production program. When asked which of these four modules was dominant and best shaped livelihoods and migration of households, a former municipal director of agriculture who offered to respond to the agriculture related issues on SADA, as it was difficult getting current directors of the Northern Development Authority (NDA) to respond, enlightened that:

*The rain-fed cereal production was the dominant as it helped households to meet their livelihood needs and subsequently reducing migration. Under this module the policy adopted farming input support scheme where agriculture Technical Service Providers were employed to supply better input and new agrarian techniques. The authority gave these service providers financial and human resources with which they supported farmers in order to enhance agriculture development. Through this agriculture support system, the authority provided input, ploughing, technical, supervisory and marketing services to farmers. This practice, which engaged a number of households led to the cultivation of more cereals particularly maize. For instance, when the program was first rolled out, this region alone had over 2500 farm households cultivating maize resulting in sudden boom of crop yield and a reduction in food insecurity [...]. This phenomenon, as at then did not only reduce outmigration but also resulted in return migration of some household members (Key Informant, July, 2023, Wa West District).*

The statement above revealed the significant role the policy played in shaping agrarian livelihoods and rural-urban migration in the region. The employment of the technical service providers, which ensured that farming households were provided with inputs (seeds, fertilisers, and agrochemicals), technical, supervisory and marketing services could explain the policy's success in shaping livelihoods. This strategic programme of the SADA policy was helpful as many farmers could not afford the cost of these inputs particularly fertiliser despite a decline in the fertility of farmlands. The informant, moreover, revealed that the out-grower system which allowed the service to directly buy farm produce from farmers also boosted livelihoods and incomes of farming households (SADA, 2016). The beneficiaries of this initiative were motivated by the proceeds they had from the programme and did not see the need to migrate. As captured in the conceptual framework, the role of transforming structures and processes (in this context, the SADA policy) is pivotal in determining the outcome of strategies employed to address livelihood challenges (DFID, 2005). In this perspective, the introduction of SADA partially solved livelihood situations and ostensibly reduced migration of households.

Accounting on the role of SADA in shaping agrarian livelihood and outmigration, another former staff (retired now) recounted that the programme had a lot to offer, however, it was saddled with a number of challenges. The following statement represent his views:

*I worked with the authority until it folded up in 2017. If the programme had continued, it would have addressed most of the livelihood gaps and adaptation challenges we had because the programme had a lot to offer. For instance, through the out-grower system, we were distributing mango seedlings to farmers. Imagine if the programme had persisted, look at the price of mango in the market as of now, farmers would have been the richest now in the region and there would have been no need for them migrate. But along the line the policy's progress was derailed by challenges such as budgetary constraints, inadequate staff, delayed planting time and marketing issues [...]. Many of these farmers abandoned their farms and started moving again for greener pasture (Key Informant, Wa West District, 2023).*

The SADA programme, according to the statement above, would have provided a fine opportunity for the people in the region to adapt effectively to climate change and reduced outmigration. Notwithstanding, challenges such as inadequate human resource base, late planting time, marketing challenges, lack of funds from the government and logistics and material constraints, adversely affected farmer input support schemes (SADA, 2016). The limited supply of inputs compelled some farmers to abandon their farms for migration. From the foregoing, the policy, which was purposely rolled out as a livelihood diversification strategy to rain-fed agriculture to reduce poverty, bridge the development gap between the savannah ecological zone and the south, and to discourage outmigration, marginally achieved its targets. This resonates with the tenet of the DFID Sustainable Livelihood Framework that, transforming structures and processes (noted in this context as SADA) plays a pivotal role in determining the outcome of livelihood strategies employed to deal with household vulnerability (Carney et al., 1999).

### **6.1.2 National Policy on Dams/One-Village-One-Dam**

Dam construction has been part of Ghana's strategy to develop the rural economy since the 1950s to mid-1960s. During this period, approximately 240 earth dams and dugouts were created in the northern part of Ghana with the sole purpose of providing water for livestock and household uses, mitigate the effects of perennial drought, and also serve as water conservation strategy (Acheampong et al., 2014). This period witnessed the concentration of government' policy towards a fast economic growth through enormous investment in agricultural production by prioritising the construction of large-scale irrigation dams. However, in the 1980s, due to managerial deficiency by government agencies and difficulties linked to operation and maintenance, dam issues were relegated to the background (Swatuck, 2008). In recent years, however, the creation of dams has reemerged. By way of responding to incessant livelihood

losses, adaptation needs and increased outmigration in northern Ghana (Antwi-Agyei et al., 2021; GSS, 2021; Fielmua, 2017; Jarawura & Smit, 2015; Teye & Owusu, 2015), a number of irrigation or dam policies have been formulated by successive governments, with the One-Village-One-Dam as the most current.

The policy aimed at promoting all-year-round agricultural activities in the five northern regions including the Upper West of the country in order to improve food security, and reduce rural-urban migration (Asamoah, 2019; Smith, 2019), as part of the Infrastructure for Poverty Eradication Programme (Pauw, 2022). The project estimated to construct 570 small dams in various villages to enhance dry-season farming (gardening) and rearing of livestock to improve food security, income levels and wellbeing of households (MoFA, 2021). As all-year-round agriculture is the mainstay and heavily dependent on climate and environmental factors, this study sought to examine the diverse ways this policy shapes livelihoods, adaptation and migration decisions of household. It was, however, discovered that the policy to a limited extent achieved its objectives, as a number of factors impeded it. These factors among other things included first, government's lack of adequate resources to construct dams for the over 5000 of villages in the five northern regions (Anang et al., 2021). Several villages until date do not have the dams, a situation that hinders households in these villages from engaging in dry season irrigation farming. Among the participants who expressed their opinions on the phenomenon, an elderly woman opined that:

*Our government promised to build dams in all villages so we could engage in irrigation farming since the rainfall is not enough these days, but that was an empty promise and never came to fruition (Female, 84 Years, March, 2022, Siriyiri).*

The inability of the government to deliver on its promise is symptomatic of several other failed government interventions to rural households who bear the brunt of climate impacts and other

socioeconomic vulnerabilities. This finding is in tandem with the assertion of Bhatta et al. (2015) that Africa's susceptibility and vulnerability to climate hazards is partly linked to poor governance systems. In a similar perspective, a key informant from the department of agriculture in the Wa West District explained that the district had not got any dams in connection with the one-village-one-dam policy. However, there were small dams (only 9 dams, 16 irrigation pumps and 70 groundwater pump) he was expecting that the government would revamp with the introduction of the new policy but that did not happen. The statement below captures his views:

*I have not seen any dam in the Wa West District as far as the one-village-dam-policy is concerned. The dams we have are old and they have not been improved upon. Last year when we had excess rain, these dams were destroyed and they have not been worked on. I was even thinking that instead of creating new ones, the government could have just rehabilitated the old ones by providing Canals and all those accessories that would make it a proper irrigation dams. [...] But I believe if these dams were given a facelift, many people particularly the youth would engage in dry season farming as a way of adapting to climate change. Once this happens, the youth would not migrate. However, when you come here during the dry season, you will find that the place is almost empty because a lot more (young male adults) are migrating in order to diversify their livelihoods (Key Informant, July 2023, Wa West).*

As presented in the statement above, the absence of the one-village-one-dam policy and the lack of maintenance of old dams in the face of agrarian livelihood losses (crop farming and livestock) defeat the policy's objective of creating jobs through irrigation of farmlands and livestock production. The situation sparked the urgency and the need for mostly the male adult household members to migrate, as they could not adapt in-situ to climate perturbations that took a toll on their livelihoods (Awuni et al., 2023), even though irrigation has been touted as one of the effective means of climate change adaptation (Alemayehu & Bewket, 2017). This phenomenon reveals the relevance of transforming structures and processes (1V1D) in the SLF in shaping adaptation strategies or migration decisions (livelihood strategies) of households as it determines positive or negative livelihood outcomes (Carney et al., 1999; DFID, 2005).

Another factor the study discovered that impeded the realisation of the objectives of the policy was the malfunctioning of the dams due to poor construction. For instance, in the Upper West region, part of the Domino Project was washed away by heavy rains. Anang et al. (2021), gathered from famers in a number of the irrigated areas that the dams have very small reservoirs and cannot store enough water for dry season irrigation farming. Respondents in the interviews noted that even communities with the dams have one challenge or the other in their quest to access and use them. According to the first participant:

*The dam over here, you need to buy a machine that will pull the water to your garden. Most of us cannot afford to buy that machine and as such, we are left with no other choice than to travel out of the community to other places to do 'paa'. In that case, we can get money to feed our families (Male Focus Group Discussant, March, 2022, Siiru).*

Highlighting a similar phenomenon, an opinion leader of Pinyiri revealed that the dam lacks water channels through which water could be pumped to people's farms. Farmers would have to use bucket to fetch water from the dam to water their plants. This situation does not only consume farmers' time, it also discourages large scale farming and consequently results in low crop yields, increased poverty and food insecurity situations in the region. This phenomenon potentially drives outmigration as people are not able to adapt to climate change and its effects (Aniah et al., 2016; Fielmua, 2017; Jarawura & Smit, 2015). The participant noted that:

*We also have a dam that people use for farming. Many people also have animals they rear. [...]. We have a little challenge with the dam. Even though it has been fenced, water channels were not constructed. Farmers use buckets to fetch water to water their plants. If we could get people to create proper water channels that connect the pipes to various parts of the dam, many more people will undertake farming during the dry season, and will not see the need to migrate for greener pastures during the dry season. Seasonal outmigration will be minimised (Opinion leader, 46 Years, March, 2022, Pinyiri).*

The two quotations reveal that despite the fact that dams were constructed in some communities, farmers could not derive the full benefits of these dams. Furthermore, given that this policy was meant to augment capacity of farmers to adapt to climate hazards (drought and irregular rainfall) through dry season irrigation farming (MoFA, 2021; Owusu et al., 2021), the account by the opinion leader reveals that the policy insignificantly enhanced crop farming. This stems from the inability of farmers to raise money to acquire the needed accessories for the dams, thereby widening the irrigation deficit in the area. Given that agriculture constitutes a major livelihood source of rural households (Antwi-Agyei, 2021; Asare & Ebo, 2019; Fielmua, 2017; Teye et al., 2021), any events (particularly climate and non-climate related) that hamper its sustenance may compel farmers to employ other means to diversify livelihoods including outmigration (Bawakyillenuo et al., 2016; Musah-Surugu et al., 2018; Vinke et al., 2021).

In addition to the poorly constructed nature of the dams and the fact that not every community has the dam, findings from the interview revealed that the policy has also been politicised. Respondents claimed that the project was executed in areas noted as strongholds of the ruling party to enable it garner more votes during the 2020 general elections. This finding is similar to that of Teye et al. (2021), where interview participants reported that government tractors meant to be distributed to farmers were given to only NPP stalwarts. Buttressing this, an opinion leader of Kunzokala reported that, the chances of a community to receiving the dam is hinged on the ability of its leaders such as the Assembly member, chiefs and other influential people to lobby. According to him, the stony nature of their farmlands makes farming very difficult especially in the dry season. As a result, he took advantage of the government's flagship programme of the one-village-one dam policy and lobbied for the dam to be built in the community. Here is what he said:

*The nature of the land we have here is stony which makes irrigation non-negotiable during the dry season for farmers. As an opinion leader, I recently made them (authorities) to construct One-Village-One-Dam here [...]. Currently, my uncle who is the 'Dubai man' is constructing another dam for me [...]. This practice, if you ask me, does not encourage dry season farming as communities that cannot lobby or vote along certain party lines will not have their fair share of the national cake. What this means is that farmers in communities that suffer this fate have more people moving out to different destinations as a way to diversify livelihoods (Opinion leader, 45 Years, Male, March, 2022, Kunzokala).*

The above statement indicates the influence of political dynamics on the implementation and sustenance of policies intended to shape livelihoods of rural households. In this instance, while only few communities in the district may have capable leaders to lobby for this project, several others may lack competent leaders who can lobby for the construction of irrigation dams. Since irrigation is critical in farming households' adaptability to the adverse effects of climate change (Adger et al., 2021; Alemayehu & Bewket, 2017; Teye et al., 2021), it stands to reason that, leaders who deploy their agency to build dams for their communities will discourage or minimise outmigration. This is because potential migrants may have the opportunity to adapt by engaging in dry season farming. Notwithstanding, it should be noted that migration can also emerge as the product of the interaction of factors such as potential migrant's intrinsic aspirations, demographics and social networks (de Haas, 2021; Massey, 2019; Teye, 2022). On the contrary, farming communities with leaders who lack the connections and the potentials to lobby for the irrigation dams may have people migrating given the slimmer chances at their disposal to adapt in-situ to the impacts climate change on livelihoods. In consonance with Sibeon's (2004, p.53) assertion on the relationship between structures and human agency, the findings to a larger extent revealed that the national policy on dams constrained farmers efforts to adapt to the adverse impacts of climate change, thereby intensifying outmigration as they need to diversify livelihoods.

### **6.1.3 National Fertiliser Subsidy Programme (FSP)**

The GoG, since independence to the 1960s, has mainly been in charge of the purchase and supply of fertilisers to crop farmers in all the regions of Ghana (Teye & Torvikey, 2018). State-owned enterprises and MoFA and agriculture extension officers were tasked to offer the fertilisers to farmers at the same price. To stabilise fertiliser prices in the country even when global prices shot up rapidly because of oil crises in the 1970s, MoFA increased fertiliser subsidy from forty percent to eighty-six percent of the prevailing market price (Nuhu & Wale, 2023). However, fertiliser subsidies were removed because of the adoption of the SAPs and market liberalisation programmes in the 1980s and 1990s (Fearon et al., 2015). The combined effects of devaluation of the currency and scrapping of subsidies resulted in a quick upsurge of fertiliser prices by more than 360% between 1982 and 1994. In the early 2000s, the multiple impacts of climate change, production stagnation, decreasing soil fertility and increased food insecurity revived interest in enhancing fertiliser subsidies as a strategy for dealing with food insecurity.

Ghana's resumption of a multi-party democracy considered subsidies scrapping as a major political capital. The NPP government coupled with other opposition political parties, during the 2000 elections pledged to bring back fertiliser subsidies if elected into office. To this end, both political parties as they take their turn in office have fulfilled this promise (Teye & Torvikey, 2018). For instance, the NPP government did not only introduce subsidised fertilisers but also brought a mechanised programme in 2007 prior to the general elections in 2008 (MoFA, 2021). The NDC government then continued with the fertiliser subsidy programme up to 2016 having won power in 2008, and even made the highest payments GHC 117.43 and GHC 164.24 in 2012 and 2016 respectively (MoFA, 2016). The government within the same year extended its subsidy programme on to organic fertiliser, the first of its kind in the country (Nuhu & Wale, 2023). The

subsidy programme was rebranded as one of the modules under the flagship programme of Planting for Food and Jobs (PFJ) when the NPP recaptured power in 2017 (Yakubu et al., 2019). Under the programme, smallholder farmers with 0.4 to 2ha of land were the major target group in addition to forty percent of woman engaged in farming (MoFA, 2019). Again, whilst chemical fertiliser subsidy dropped from 50% to 38%, the subsidy on organic fertiliser declined from 50% to 40% (MoFA, 2021). In 2020, the government through MoFA, purchased and supplied 364,233 metric tonnes of inorganic and organic and fertilisers to 1.2 million farmers at 50 % subsidy (MoFA, 2020). However, in 2021, a total of 521,380 metric tonnes of inorganic and organic fertilisers was distributed by MoFA to 1.5 million farmers. More so, whilst chemical fertiliser subsidy dropped from 50% to 38%, the subsidy on organic fertiliser declined from 50% to 40% (MoFA, 2021). This phenomenon got stakeholders to raise concerns about the sustainability of the programme. In 2022, the 25kg NPK and SOA fertilisers were sold to farmers at prices ranging from GHC 125 to GHC160 (MoFA, 2022). The various kinds of organic fertiliser, on the other hand, was sold to farmers at prices ranging from GHC 33 to GHC 55 (MoFA, 2022).

The government's fertiliser subsidy programme has been in the Upper West region since its inception (Yakubu et al., 2019). Given the impact of climate change on livelihoods coupled with high rate of declining soil fertility in the region (Baffour-Atta et al., 2021; Derbile, 2022; MoFA, 2022), the programme is considered beneficial and one of the best strategies that can help farmers adapt to climate change and consequently shape outmigration. However, farming households in the study areas expressed varied opinions about the impacts of the programme on their livelihoods during the interviews. Respondents revealed that issues such as high cost, limited access, late distribution, politicisation and smuggling of fertilisers bedeviled the fertiliser subsidy programme. They reported that the current hike in the price of fertilisers has been their

major concern as many farmers are poor and lack the financial capacity to purchase the commodity and apply on their farms. This is consistent with Crawford et al. (2003) and Jayne et al.'s (2018) assertion that only the rich farmers and those with high incomes benefit from input subsidies due to poor targeting.

Others linked the price hike to the claims that the subsidy has been scrapped from the fertiliser. These views are a confirmation of the 2021 MoFA's annual report, which indicates that government slashed the subsidies on chemical fertilisers from 50% to 38%, thereby making farmers pay more (MoFA, 2022). The case of Don, a 58-year-old man in the Siiru community sheds light on this phenomenon. Don has been farming in this community almost all his life. He mentioned that their farmlands have increasingly witnessed severe decline in fertility resulting in poor crop yields. This phenomenon, according to him, has made the use of fertilisers very crucial and rampant. He, however, revealed that farmers who lack the financial capacity to purchase the product usually embark on seasonal migration as a way of dealing with idleness:

*I have been farming almost all my life in this village. Consistently, farmlands in this village have increasingly lost fertility making the use of fertilisers a vital aspect of farming. But these fertilisers have become so expensive that many farmers including myself cannot afford, even though our agriculture officials keep telling us that government has subsidised the cost.[...]. For instance, the first time I bought fertilizer, it was GhC20 but these days I buy fertiliser at GhC500 for just a bag. I know the price of fertiliser is going to double next year. [...]. And because it is not possible to farm here without fertilisers these days, many farmers particularly the male adults have migrated to the south. As they arrive their destinations, some engage in menial jobs through which they earn income and buy the fertiliser from the south and bring it home during the rainy season to farm. But for my age I would have also left **(Don, 58 Years, March, 2022, Siiru).***

The narration above confirms the limited impact the FSP has on agrarian livelihood as portrayed in the literature (Teye & Torvikey, 2018; Yakubu et al., 2019). Even though the policy aims at reducing rural poverty by supporting smallholder farmers to increase agriculture output in the

face of negative climate activities (MoFA, 2021; Teye & Torvikey, 2018), the rise in fertiliser prices partly attributed to a combination of fertiliser subsidy decline and other factors (MoFA, 2022), hinder the achievement of this objective. As the policy in this instance, is perceived as slightly shaping livelihoods, thereby limiting rural farmers' ability to adapt in-situ, the young male adult farmers are more likely to migrate seasonally to the south, since the impact of the slash in fertiliser subsidy directly hits them. This could partly explain the high incidence of male outmigration in the study areas (Table 5.1). Nonetheless, it should be clarified that migration could be the outcome of the interplay of multiple factors (de Haas, 2021; King, 2012; Lee, 1966; Massey, 2019; Teye et al., 2019). On this account, it can be argued that the FSP is one of the triggers of outmigration. In consonance with the concept of duality of structures (Holt-Jensen, 2009; Leach et al., 1999), even though a multiplicity of economic (unstable market prices) and political (downward review of subsidies) factors somewhat constrained human agency (farmers' ability to buy and use fertilisers on farmlands), male adult farmers who had the capabilities were able to adopt migration to mitigate the limitation of the programme. Moreover, this shows the materiality of the transforming structures and processes (FSP) in the conceptual framework, as it shapes farmers' ability to address the vulnerability—declining soil fertility (DFID, 2005).

In a similar account, another respondent recounted that, as fertiliser usage is inevitable, coupled with its rising price, a number of farmers particularly the youth whose inclination to farming is peaking are losing interest in the said livelihood. According to the respondent, this situation is shaping the youth to consider outmigration as a feasible alternative to agrarian livelihoods, given that non-farm livelihood such as trade is equally hampered by climate change. A participant during a focus group discussion stated that:

*At first, agriculture officers told us that they were going to bring us fertiliser, so they made us write our names but the fertilizer never came. They told us we were going to pay something small and the government will pay the rest, so we paid the money. The few farmers that paid their money first got the fertiliser but majority of us that paid later had their money refunded without the fertiliser [...]. What we should know is that for one to farm without fertiliser, then it is better you do not farm because you will not get anything. The youth who are much involved in farming are now losing interest. And this is one of the reasons why our young men and women are migrating out of the community, given that even non-farm livelihoods are also affected by climate change. ...*  
**(Male focus group discussant, March, 2022, Pinyiri).**

The FSP, aside from aiming to reduce poverty and expanding agriculture output (MoFA, 2021; Teye & Dzifa, 2018), was also implicitly intended to shape particularly seasonal outmigration (Nuhu & Wale, 2023). As farmers including women have access to cheap and free fertilisers to deal with infertility of farmlands, many will be attracted to farming given that the product has the potentials to churn out high crop yield (Abakisi, 2018; Nehu & Wale, 2023). Although market fluctuations and post-harvest loss could adversely affect crop yield (Antwi-Agyei, 2021; Baffour-Atta et al., 2021), it is possible that increased agriculture output may improve household income, bolster adaptation to climate disturbances and downwardly shape their outmigration aspirations (Teye et al., 2021). However, as the statement above reveals, even instances where farmers had registered and paid for the product they were not given. This incident, according to the discussant, has forced adult male farmers particularly to consider migration as a feasible means of supplanting their loss livelihoods. Against this backdrop, one could argue that largely, FSP positively shaped farmers' capabilities and migration aspirations (de Haas, 2021). It should be noted that despite the fact that many people cannot access the fertilisers to farm and therefore need to move, some are still not able to move due to financial constraints and other personal factors (Black et al., 2014; Foresight, 2011; Teye et al., 2022). The precarious situation this category of people are plunged into are further exacerbated (Ribot et al., 2020). As evident in the

conceptual framework of this study, the position of the transforming structures and processes (FSP) is crucial as it determines the degree of vulnerability poor farming households are engulfed (Carney et al., 1999).

Contrary to the initial findings that FSP has led to increased outmigration, an interview with a key informant at the department of agriculture in the Jirapa Municipality revealed that the programme to a higher degree has minimised migration. The informant reported that since the reintroduction of the FSP as a module under the PFJ from 2017 until date, farmers through diverse spectrum have been supplied with primarily inorganic fertilisers. This according to him has reduced the rate at which people move out of the municipality. The statement below captures his views:

*With regards to migration, I think this policy has helped a lot in reducing it. In the sense that, under the PFJ, farmers have access to subsidized fertilisers, and cheap and free seeds that mature early. Prior to the implementation of this policy, young people were traveling a lot, because they did not have enough money to buy fertilisers to deal with the declining soil fertility. While at the destinations, they worked for money so they could buy these items. In this community, if you do not have money to buy fertilisers, then it is better you do not farm at all. [...]. This place prior to 2017 was virtually empty due to increased outmigration. But now people are not moving, as many are engaged in farming. This has resulted in increased farmlands as those who were not into farming are now farming... (Key Informant, July, 2023, Jirapa).*

The informant's statement enlightens that but for the reintroduction of the FSP; poor soil fertility would have continued to weaken the adaptive capacity of farming households. As farmers could barely adapt in-situ to this hazard prior to the reintroduction of the programme in 2017, outmigration became a viable livelihood alternative that provided income generation channel by which this farming input was acquired. What the narration is silent on, however, is the fact that migration in the context of slow-onset climate process does not happen in a vacuum (Codjoe & Atiglo, 2020; Hoffmann et al., 2020; Zickgraf, 2021). It involves either individual or household

decision making where the potential migrants rationalise the pros and cons (cost-benefit analysis) of the movement and decide whether to move or stay (Massey, 2019; Musah-Surugu et al., 2018; Stark, 1991). Additionally, outmigration is also hinged on aspirations and capabilities of the potential migrants, and other socioeconomic and political factors (de Haas, 2021; Lee, 1966; Massey, 2018). Notwithstanding, migration according to the informant's account, dwindled after the programme was rolled out since farmers now had the 'antidote' to declining soil fertility, and subsequently gaining higher yields and reducing poverty. This finding confirms the assertion that fertiliser application forms a crucial adaptation practice for communities experiencing declining soil fertility partly attributed to adverse impacts of climate change (Asante & Bawakyillenuo, 2021; Nuhu & Wale, 2023; Yakubu et al., 2019; Yaro et al., 2016). However, literature shows that outmigration in recent times is prevalent in the region particularly among young male adults (GSS, 2021; Teye et al., 2021). Based on the narration, it could be conjectured that the FSP significantly reduced outmigration among young household members. This phenomenon also affirms the significant function of the transforming structures and processes (FSP) in shaping the outcome (improved crop yield, increased income and reduced migration) of a livelihood strategy (fertiliser application) adopted to shape vulnerabilities—poor soil fertility (DFID, 2005).

#### **6.1.4 One-District-One-Factory**

The One-District-One-Factory (1D1F) is an initiative of the current government to transform the nature of the country's economy from the type, which is reliant on an import and export of raw material to one that is fixated on manufacturing, value addition and export of processed goods. According to available data, 106 out of 278 factories have been built with additional 148 at various stages of completion (Ofori-Atta, 2022). Although the policy has a number of strategic objectives including the creation of massive employment particularly for the youth in rural and

peri-urban communities, so as to improve income levels and standards of living, as well as reduce rural-urban migration; to add value to the natural resources of each district and exploit the economic potential of each district based on its comparative advantage; ensure even and spatial spread of industries that would stimulate economic activity in different parts of the country; promote exports and increase foreign exchange earnings; and enhance the production of local substitutes for imported goods thereby conserving scarce foreign exchange (Eshun, 2019; Ofori-Atta, 2019), given the focus of this study, the first strategic objective was examined.

As the Upper West Region, and for that matter the study areas, is known for its high incidence of rural-urban migration which stems from persistent rise in unemployment and poverty (Fielmua, 2017; GSS, 2021; Tanle & Kyereme, 2014; Teye et al., 2021), it was imperative to examine the significance of the 1D1F policy in shaping rural livelihoods and outmigration. During interviews and focus group discussions, it emerged that the policy is not playing any significant role in connection with employment creation, which in turn has implication for outward mobility. In expressing his views, an opinion leader of Kunzokala lamented that:

*As you already know that when it comes to poverty, unemployment and youth outmigration, this region suffers the worst form. Majority of us are farmers but climate change has rendered us jobless because the drought these days is severe. When you farm is either you will get poor or no yield at all. With this situation if you are a man with family would you still stay here? No. So I was very happy when I first heard this government talking about 1D1F. Because I was hoping that the youth including myself will finally get something substantial to do, but all this ended as a wishful thinking. We were also of the view that since the policy talks about adding value to natural resources for export, farmers here will be well resourced to do large-scale farming, but I think that was another wishful thinking. In short, as an assembly member of this area, I haven't seen any factory, and as for migration, it's not only common but also rampant ... (Opinion leader, July, 2023, Kunzokala).*

Another participant during adult mixed focused group discussion also reported that:

*The very first time I heard of this policy, I said if it's not one of the failed government policies, then it would be the best given that it will not only reduce outward migration (due to loss of agrarian activities to climate change) but it will also result in increased return migration. This is because many more people will get both direct and indirect jobs to do, which will reduce their socioeconomic burden. But it seems I guessed right, the policy has failed (Female Focus Group Discussant, March, 2023, Kunzokala).*

The above submissions suggest that the 1D1F has failed to realise its first strategic objective of creating more employment, improving income and standard of living of rural folks and reducing rural-urban migration (Adu-Prah et al., 2019; Ofori-Atta, 2019). As the first respondent alluded, climate change is hampering agrarian livelihoods (Chapter four of this study), exacerbating unemployment and poverty situations of households. Outmigration therefore becomes a feasible option of dealing with the socioeconomic vulnerabilities created by climate hazards (Awuse & Tando, 2016; Fielmua, 2017; Vinke et al., 2022). Community members particularly the youth anticipated that the 1D1F would offer alternative livelihood that would enhance their abilities to adapt in-situ and minimise the incessant outmigration (Adu-Prah et al., 2019). This account mirrors the conceptual framework of the study, where climate and non-climate related hazards define the vulnerability context (livelihoods loss) of households, with transforming structures and processes (1D1F) shaping capabilities (assets) through job creation so as to enhance adaptation and further minimise outmigration (DFID, 2005).

Nonetheless, as confirmed by the second respondent, the expectations of households and community members remained a wishful thinking as the implementation of the 1D1F policy failed to achieve one of its strategic objectives (Ofori-Atta, 2019). To enable households deal with unemployment partly caused by loss of agriculture livelihoods through negative climate impacts coupled with the failed 1D1F policy, the youth resort to outmigration (Fielmua, 2017; GSS, 2021; Tanle, 2016; Van der Geest, 2011). This may partially account for the greater

proportion of household members (68%) who migrated in search of employment opportunities and to hustle for better livelihood alternatives (see Table 5.1: Reasons for migration). The principle of duality of structures plays out here, as though a combination of climate and political factors (1D1F) did not enhance the ability of farmers to adapt to the impacts of climate change on livelihoods, farmers particularly the youth were able to deploy outmigration as their agency to deal with these structural deficiencies (Holt-Jensen, 2009; Leach et al., 1999).

The literature shows that out of the 106 factories completed, only three are located in the northern savannah zones of the country, which in total have provided both direct and indirect jobs for about 6000 individuals (Ofori-Atta, 2022). According to available data, the three completed and operational factories are located in Tamale Municipal (LK International Company-Motor King), Wa Central (Savannah Foods Empire Limited) and Tamale Municipal (Gee Fresh Company-Rearing and processing Guinea Fowls). Learning from available data that only 1 out of the 9 proposed factories in the Upper West Region is completed and operational and employing only 210 people, coupled with the views expressed by respondents, it can be contended that the 1D1F policy is not enhancing livelihood situations and rural-urban migration.

## **6.2 The role of local institutions in shaping livelihoods and climate-induced migration**

The local and place-specific context of climate impacts (Antwi-Agyei et al., 2021; Bawakyillenuo et al., 2016; Warner et al., 2015; Wilkinson et al., 2016), makes the role of local institutions paramount in shaping household livelihoods and adaptation as these have implications for people's mobility decisions (Adaptation Learning Programme, 2015; Agrawal, 2008; Mataga, 2019; Yaro et al., 2016). Mostly, these institutions play intermediary role between national governments, international organisations and the affected households and communities. According to Ostrom (2000), institutions are the rules that are functional in relationships between

individuals and not simply construed as an organisation. According to Koelble (1995), whilst institutions constitute the rules, norms and strategies that shape individual and organisational behaviour, organisations are the social structures that contain agency.

Local institutions, which are mainly formal and informal, are further categorised into three namely; state/public, private/market, and civic/civil society (Agrawal, 2008). Institutions that are classified as state/public constitute local governments and local state agencies. The private/market institutions on the other hand, include services organisations and private businesses. In addition, civic/civil society constitutes membership of organisations, cooperatives, savings and loan groups, and other informal groups. Agrawal's (2008) categorisation also reveals that there are formal-local and external institutions. The formal-local institutions are composed of village council/chiefs and subjects, forest local management committee, family meetings and local NGOs. The external institutions include local government agency, international organisations and international research centres. Although these institutions play diverse roles, they complement each other's effort in meeting specific needs of households at a given time.

Through in-depth interviews and FGDs, a number of local formal state institutions were found in the study areas, these included government agencies such as MoFA, NADMO, agriculture extension officers, veterinary officers, local government, district weather stations and district fire service department. Additionally, among the local formal institutions, the land tenure system was identified as key. Not much of private sector institutional influence is present as only one major private business in the hospitality industry (Royal Cozy Hills Hotel—Jirapa Dubai) is found in Kunzokala in the Jirapa Municipality. However, a number of civic/civil society organisations were found including NGOs, religious bodies, village savings and loans group (Susu scheme for women). In addition, local informal institutions and actors present include local chiefs, sub-

chiefs, family systems, friends, farmers association, women's group, and community volunteer group. In spite of these, the next sub-section examined how key local institutions (formal and informal) such as land tenure system, family and friends, NGOs and District/Municipal Agriculture Department significantly influenced household livelihoods and outmigration.

### **6.2.1 Land Tenure System**

For agrarian rural communities adversely affected by climate change, land plays a critical role in shaping livelihood and adaptation needs of farming households (Anang & Owusu, 2020; Baffour-Atta, 2021; IPCC, 2022; Teye et al., 2021). This makes land governance a crucial issue in these areas. In that regard, Abbas et al. (2018) posited that many local institutions that promote and help improve livelihoods do so through better and more sustainable governance of local natural resources largely land. According to Mensah et al. (2022), land governance embodies policies, procedures, processes and institutions through which land, assets and other natural resources are managed. The authors further posited that land governance also involves decisions on access to land, land right, land use and land development. As it pertains to all African countries including Ghana, two forms of land ownership and acquisition are prevalent and these are traditional or customary medium of land acquisition and ownership and modern medium of land ownership and acquisition (Abakisi, 2018; Yaro, 2010). However, this study focuses on the former, as it is the dominant mode of agriculture land acquisition and use in the northern Ghana including the Upper West region (Songsore, 2009). The traditional mode of land acquisition and ownership dates back to history. In the olden days, the first settlers of an area through migration, conquest and natural disasters became the owners of the land (Bebelleh, 2008). The 'first settlers' in some communities in the northern regions are usually referred to as the "tendaanas" (Songsore, 2009). Customary lands are therefore lands owned and regulated by

stools (ethnic groups), clans or families where traditional and customary norms and practices govern their leases or tenure administration (Fiadzigbey, 2006; Mensah et al., 2022). As a result, customary lands are believed to belong to the past, present and future generations

In the Upper West Region and for that matter the study areas, governance and control of land are under the authority of family heads, clan and others (Dittoh, 2004; Jinbaani, 2016; Songsore, 2009). This mode of land governance is an evolution of the communal land tenure system which dates back to pre-colonial eras (Bebelleh, 2008; Songsore, 2009). Studies have shown that as far as ownership and control of land are concerned, chiefs or chieftaincy institutions have very limited influence (Abakisi, 2018; Anaglo, 2014; Dittoh, 2004; Songsore, 2009). Families and clans are the rightful owners of all lands in the region; therefore, they determine what actions to take. Unlike the Northern and Savannah regions where chiefs control lands, heads of families and clans, and “tindaanas” hold lands in trust for the people in the region. However, the authority of tindaanas over land has progressively become more spiritual than physical. As spiritual custodians of the land, tindaanas are consulted when someone’s purposes of using the land has a spiritual connotation. For instance, activities such as funerals, burials, building of new houses and sacrifices at fetish coppices are deemed to have spiritual implications (Songsore, 2009). Even though chiefs do have control over their own family lands, this authority cannot be extended to other families. According to Abakisi (2018) and Kuusaana (2013), this form of land tenure practices does not support women acquisition and ownership of land due to the patriarchal norms. Nonetheless, women have the right to gather firewood and collect fruits of economic trees, barks, roots and foliage on very fertile lands. To ascertain the current state of this mode of land governance in the study areas, an opinion leader during in-depth interview affirmed that there has been no change in this system of land tenure. He, however, clarified that:

*It is believed that land belongs to the family head of a particular unit or clan. And once the head of the family, we always assume that the man who feeds the family is the head of the family. So once the land belongs to the head of the family, when he is about to pass on he passes that to his elderly son who is also basically a man. So depending on the number of children in the family, you share the land and farm. So if they give you a piece of land and you have a wife and you think that you can give her part of it, fine it is not prohibited, but it is not owned by a female in the community (Opinion leader, 35 Years, March, 2022, Kunzokala).*

As revealed in the aforementioned statement, patrilineal system of inheritance as practiced in the areas is key in ensuring that male children inherit portions of land owned by their father (household head). Some scholars have, therefore, argued that this practice offers men the superior authority in owning and accessing farmlands over women in the region (Abakisi, 2018; Quisumbing & Pandolfelli, 2010). This preferential treatment given to men over women reflects the ideals of the conceptual framework, where access to livelihood assets is mediated by transforming structures and processes (Carney et al., 1999).

Having established that land is governed through family systems and anchored on patriarchal norms in the study areas, it was important to ascertain the manner in which this system of land tenure influences household livelihood, their adaptability to climate impacts and outmigration. During key informant interview, the chiefs revealed that the tenure system has minimal impact on agriculture production and in-situ adaptation, hence partly contributing to increased outmigration in the area. One of the chiefs had this to say:

*This system of land ownership and acquisition has been there before some of us were born. One thing I have noticed is that every family has their own portions of land that the family head shares among male children as their inheritance. So, in the first place, if the male children are many and the available land to be shared is not vast, then it implies that each will receive only small parcel of the land barely enough for subsistence farming. More so, the tenure system is such that it is nearly impossible to get other idle land to farm, unless from people who have left their lands and traveled or from those who deliberately left the land to fallow. Notwithstanding, as they continue to*

*farm over and over again on the same piece of land, the fertility of the land declines, and this in addition to prolong drought have given rise to low crop yield and low income, thereby increasing the poverty that affects us. As many cannot farm due to the factors I mentioned earlier, they (mostly the youth) resort to migration, as there are no alternative livelihood sources in this village (Opinion leader, July, 2023, Siiru).*

From the above narrative account, it could be observed that the traditional land tenure system does not enhance large-scale (commercial) farming owing to the limited size of farmlands, which is further plagued with soil infertility partly caused by over-cultivation. The resultant effect of these challenges are low crop yield and increased poverty. Boone (2013) confirms this assertion by stating that this system of land tenure does not encourage agriculture growth and economic productivity as compared with the Western-style tenure system and property rights. This situation in conjunction with negative climate event such as drought amplify the existing socioeconomic vulnerabilities of farmers (Abubakar et al., 2021; Aniah et al., 2016; Antwi-Agyei, 2021; Baffour-Atta et al., 2021). Given this scenario, farmers are less likely to adapt in-situ to climate change and its disturbances. In their bid to build resilience against vulnerability, some individual farmers (male adults) embark on seasonal migration to diverse destinations in search for economic opportunities (Codjoe & Atiglo, 2020; Fielmua, 2017; Hoffman et al., 2020; Kluger et al., 2020; Vinke et al., 2020). It is not surprising that male outmigration for this purpose is relatively high (see Table 5.2: Reasons for migration). Although migration exudes development potentials through remittances (Banerjee et al., 2017; de Haas, 2021; Teye et al., 2023), it can intensify vulnerabilities and further weaken the adaptive capacities of households through livelihood losses and non-economic losses (Campbel, 2014; Jacobson et al., 2019; Vinke et al., 2020). Based on this narrative account, it could be argued that the traditional land tenure system does not enhance agrarian livelihoods, thereby limiting in-situ adaptation and encouraging outmigration. As important as this livelihood asset (land) is to households and

communities, the role of transforming structures and processes (traditional land tenure system) in ensuring farmers' access and use is more pivotal (DFID, 2005; Serrat; 2017; Small, 2007).

### **6.2.2 Family and friends**

Family and friends are considered an important social informal local institution due to its significant contributions towards assisting households and communities negatively affected by climate change (Barnes et al., 2020). According to McCarthy (2021), family is seen as the primary and the most significant social grouping of individuals and societies. It is a relationship that exist between a minimum of two people who are connected by birth, marriage or adoption. Like other parts in Ghana, two main family systems exist in the study areas; these are the nuclear and the extended family systems. Whilst the nuclear family is constituted of father, mother and children either biological or adopted, the extended family, on the other hand, consists of several of nuclear families standing as one entity. The family systems were identified as more of an extended than nuclear as each nuclear family had a relative of either the husband or wife included. In this study, friendship is explained as a socially oriented set of relationships that bind a minimum of two individuals who are not linked to one another through birth, marriage or adoption (Policarpo, 2015). They are dedicated to assisting each other with emotional, material and monetary supports. This study did a combined analysis of the family and friends considering the similar social function and support they provide.

These social informal institutions play crucial role in sustaining vulnerable households through the provision of essential resources such as money, food and inputs. During the survey, respondents were asked if they had received assistance from their relatives and friends in the past in connection with climate change perturbations. Additionally, explanations to how these forms of assistance received influenced livelihood activities, adaptation and migration were gathered

during the qualitative study. Table 6.1 summarises the multiple responses of the respondents as a respondent could receive both or all the supports provided.

**Table 6.1: Family and friends’ assistance to households with regular or occasional support**

Kinds of support	Wa West			Jirapa			Overall		
	Male N=21	Female N=16	All N=37	Male N=19	Female N=11	All N=30	Male N=40	Female N=27	All N=67
	%	%	%	%	%	%	%	%	%
Money	100	93.8	97.3	94.7	90.9	93.3	97.5	92.6	95.5
Food	33.3	31.3	52.6	52.6	54.6	53.3	42.5	40.7	41.8
Inputs	9.5	0.0	5.4	0.0	18.2	6.7	5.0	7.4	6.0
Total valid cases	143	125.1	135.1	147.4	163.7	153.3	145.0	140.7	143.3

Source: Fieldwork, 2020

The survey data as presented in Table 6.1 above indicated that out of the 67 respondents who acknowledged receiving food, inputs and money from family and friends, nearly all (95.5%) from both study areas received monetary assistance. The overall gender disparity revealed that approximately 98% of the male respondents claimed to have received money from their relatives and friends. Similarly, a higher proportion of the female respondents (92.6%) also received same assistance from their family and friends. The data at the district level showed a high level of acceptance of monetary gift from family and friends with respondents from the Wa West District (97.3%) marginally surpassing their counterparts in the Jirapa Municipality (93.3%). On a similar tangent, the Wa West District recorded greater proportions of both males (100%) and females (94.7%) who reported receiving money than their colleagues, male (94.7%) and female (90.9%) in the Jirapa Municipality. It was discovered through focus group discussions and in-depth interviews that migrant remittances mainly constituted monetary assistance received from family and friends. During one of the in-depth interviews, Mohammed, a 56-year-old farmer who had three children living in Sunyani and Kumasi revealed how the monthly stipend he receives

from his children has supported his crop production especially during the dry season. Consequently, he does not aspire to migrate even considering his age.

*I have three adult children who are currently living in Sunyani and Kumasi and are working. But I have been farming in this village for several years. [...]. My children send me money every month to support my farm activities and other household needs such as paying school fees for their younger siblings. I am able to use part of the money to buy fertilisers and hire tractors and farm labours to work on my farm. Even during the dry season when not everyone is able to farm, I do cultivate vegetables because I hire women to fetch water from the river to water my crops. About eight years ago, I always wanted to migrate because of crop failures and poverty, but now I do not even think about it because I know my children will send me money at the end of every month (Mohammed, 56 years, July, 2023, Siriyiri).*

The case of Mohammed depicts how family as a social informal local institution can shape livelihood and migration decisions of households through remittance or monetary assistance. For instance, in the face of decreasing soil fertility, Mohammed used part of the remittances he received to buy fertilisers to boost the fertility of the soil in order to enhance crop yield. Since increased crop yield potentially results in increased household income and reduces poverty (Aniah et al., 2016; Antwi-Agyei, 2021; Ribot et al., 2020), outmigration for people who experience these positive socioeconomic variables is less likely to persist, as migration is greatly determined by some of these socioeconomic factors (Adger et al., 2021; Lee, 1966; Ribot et al., 2020; Teye et al., 2021). The monetary assistance Mohammed received also enabled him to adjust and adapt to the impact of drought through dry season farming. This discovery is consistent with the assertion of Gemmene & Blocher (2017), that migrant remittances are very significant in building the resilience of left behind family members who engage in crop and livestock production. The finding also supports studies conducted in Asia and Pacific; where climate affected households depend on savings and on money from family and friends as their source of finance (Erman et al., 2021). The more people like Mohammed are able to adapt to

climate change disturbances through family and friends' monetary support, the less likely they will aspire to move, even though their migration decision could be influenced by aspirations and capabilities (de Haas, 2021). This revelation also supports Mcleman's (2018) postulation that migration reduces as people build more adaptive capacity to the impact of climate change. As postulated by Sebion (2004) that structures have the potentials to constrain or enhance individual's agency, in connection with this finding, family as an informal local institution is enhancing the capabilities of some farmers in adapting to climate change hence, reshaping their migration aspiration.

To confirm the case above, a participant in a focus group discussion reported that even though our relatives and friends are helping us to adjust to the effect of climate change, the flow of remittances are either irregular or the amount sent are not adequate. Monetary assistance from friends are mostly insignificant and mainly comes in the form of loans which are payable on agreed terms (sometimes with or without interest). A female focus group participant said that:

*Yes, those who have migrant children in the south sometimes do receive something small (money) from them. This money is not only enough but also does not come all the time. We cannot blame them because things are not easy for them over there too. Nonetheless, we are able to manage whatever we receive to acquire fertilisers, seeds and other farming inputs. As for support from friends it is not common, but even those who receive such support claim it comes in the form of a loan. Because of this little support some of us receive, those of us who planned to migrate have always rescinded such decisions, but the youth still migrate even after receiving this support. ... (Female Focus Group Discussant, 47 Years, July, 2023, Kunzokala).*

Though insignificant, the aforementioned report reveals that family and friends enhance the adaptive capacity of households in building resilience to climate impacts, as financial support received were channeled into acquiring farming inputs. As farmers are able to proactively and reactively adjust to the disturbances of climate change on their livelihoods (Vinke et al., 2020;

Hoffman, 2020), their drive for migration will be minimised if not curtailed (McLeman, 2019; Rigaud et al., 2018; Wilkinson et al., 2016; Zickgrafe, 2021). However, migration is also hinged on demographic dynamics and aspiration of potential migrants (de Haas, 2021 GSS, 2021; IOM, 2019; Teye et al., 2019). This situation is revealed in the above statement as the youth in particular are noted for migrating even after receiving assistance from family and friends.

It can be inferred from Table 6.1 above that not much input support was received, as only 6.0% of the respondents who acknowledged receipt of family and friends' assistance from the entire study areas claimed so. The combined analysis of gender from the two districts showed that more female respondents (7.4%) than male respondents (5.0%) received input support. The proportion who received input support in the Jirapa Municipality (6.7%) slightly exceeded their counterparts in the Wa West District (5.4%). While no male respondent received input support in the Jirapa Municipality (0.0%), Wa West District had only 5.4% of the male respondent who received input support. Reports gathered from the qualitative studies validated the results of the survey data as participants confirmed rarity of receiving inputs such as fertiliser, seeds and agrochemicals from relatives and friends. They instead indicated that the monetary support that comes from family and friends are used to acquire some of these inputs. The account of a participant is captured in the statement below:

*To the best of my knowledge, we do not receive input support from our relatives and friends who are here or outside this community. What we do is that, the monetary support we receive from our relatives and friends are used to purchase inputs mostly fertilisers, seeds, and agrochemicals. But if we were to receive inputs from our relatives and close associates, it would have gone a long way to help our crop production, as due to the numerous financial needs we have, some are not able to buy the inputs with the money they receive, coupled with the fact that government's subsidy programme are failing.[...]. As we receive this support to supplement the little we have, many will engage in all-year-round farming and not travel out of the community. This would stop*

*or reduce the increased incidence of migration (Male Focus Group Discussant, 45 Years, March, 2022, Kunzokala).*

It is evident from the above narration that the failure of family and friends to support farming relatives with inputs has implications for crop production considering the little to no government subsidy or intervention programme to farmers. This phenomenon may limit local farmers' ability to adapt to climate change as inputs support is pivotal in agriculture production (Bawakyillenuo et al., 2016; Nuhu & Wale, 2023; Yakubu, 2018). This can potentially result in increased human migration, as people may want to diversify livelihoods (Adger et al., 2018; Vinke et al., 2022). In this context, it could be debated that family and friends as a social local informal institution is to some extent contributing towards outward human migration.

### **6.2.3 NGOs supports and service provision**

NGOs are defined as private, non-profit and independent organisations that seek to relieve difficulty, promote interests of the poor, protect environment, provide basic services or do community development in developing countries (Yakubu et al., 2019). NGOs play crucial roles in climate adaptation particularly at the local and community levels. Among the NGOs identified in the study areas were RESULT, World Vision International, GIZ and Action Aid. The agriculture departments and the communities of study, through in-depth interviews, key informant interviews and FGDs jointly identified these NGOs. This section identifies the kinds of support given by these non-profit organisations and how household livelihoods, climate adaptation and migration aspirations were influenced by these organisations. Respondents during the quantitative survey disclosed that some of these NGOs provided them with money, training and input supports. The proportions of respondents who received these supports are summarised in table 6.2 below:

**Table 6.2: Proportion of households that received different types of supports from NGOs**

Receipt of help	Wa West			Jirapa			Overall		
	Male N=3	Female N=4	All N=7	Male N=4	Female N=1	All N=5	Male N=7	Female N=5	All N=12
	%	%	%	%	%	%	%	%	%
Money	-	-	-	0.0	100	20	0.0	20.0	8.0
Inputs	100	75.0	85.7	100.0	0.0	80	100	60.0	83.3
Training	0.0	25.0	14.3	25	0.0	20	14.3	20.0	16.7
Others	0.0	25.0	14.3	25	0.0	20	14.3	20.0	16.7
Total valid cases	100	125.0	114.3	150	100	140	128.6	120.0	125.0

**Source: Fieldwork, 2020**

As evident in Table 6.2 above, the contribution of NGOs about the provision of money, inputs and training is insignificant given the limited number of recipients of such supports. However, out of the total respondents who received NGOs supports, majority 83.3% across the study areas claimed to have received input supports. Whilst all the male respondents (100%) across the entire study areas received this form of support, three-fifth of the female respondent (60%) also claimed to have been assisted with inputs by the non-profit organisations. Part of the reasons for which all the males received inputs may be attributed to the fact that farming is largely undertaken by men. When differentiated by districts, the data showed that the proportion that received input support in the Wa West District (85.7%) exceeded those that received it in the Jirapa Municipality (80%). Whereas all the male respondents in both districts received NGOs input support, Wa West District had (75% of female respondents who received it. Contrary to the data gathered from the survey (Table 6.2), the impact of NGOs concerning input support, as per the qualitative data collected, is enormous. To ascertain the kinds of support farming households receive and how these shape livelihood and people's decision to migrate, it emerged that the NGOs, among other things, supported farmers with fertilisers, seedlings and agrochemicals,

fencing materials and fish. As a way of helping farmers to diversify crop production, household members are also provided with poultry for keeping and animals such as goat, pigs, rabbit and sheep to rear. Though several stakeholders including chiefs, assembly members, farmers association expressed similar views to this effect, all these views are subsumed in the thoughts of the chief of Siriyiri as shared below:

*This community has a number of NGOs working with us. Notable among them are World Vision International, Action Aid and GIZ. These organisations have assisted farmers in diverse ways. They have given us primarily fertilisers, agrochemicals, seeds, materials for fencing farmlands to prevent animals from destroying our crops. Some farmers also received fowls and goats, sheep, rabbits, and pigs to rear. For instance, World Vision and Action Aid in particular support our women with bags of fertilisers and maize seeds for cultivation. This form of support has improved farming in this community, hence attracting more people to engage in crop farming [...]. Those who normally travel seasonally to the south have minimised the rate at which they move. The animal project has also reduced youth outmigration as they now earn income through the sale of the animals to do other things (Opinion leader, March, 2022, Siriyiri).*

The statement of the opinion leader agrees with existing literature on the contribution of NGOs to rural development through enhancing agrarian livelihoods and other non-farm livelihood intervention programmes for climate affected households and communities (Haris et al., 2021; Persson, 2019; Teye et al., 2021; Yakubu, 2018; Yaro et al., 2016). The provision of these inputs by the non-profit organisations marks a significant feat in positively transforming agricultural activities of farmers, given that many lack the financial capacity to acquire them. This serves as a disincentive for beneficiaries to migrate, given that farming, the main source of livelihood, has not only become less expensive, but also more rewarding in terms of growth in both crop yield and household income (Lederer, 2015; Yakubu et al., 2019; Yaro et al., 2016). Contrary to this, scholars have posited that as socioeconomic situations of households or communities improve people aspire to move (de Haas, 2021; King, 2012; Teye et al., 2019). This moreover, confirms

the assertion that migration is a social transformational phenomenon with complex causalities (Massey, 2019).

In addition to input support, NGOs also provided training services to farmers as a way of building their resilience against the impacts of climate change. The overall analysis of the data across both study areas (Table 6.2) showed that less than twenty percent of respondents (16.7%) claimed to have received training support from NGOs. At this level, the female respondents (20%) who received training support were more than their male respondents (14.3%) who received it. When differentiated by districts, while Jirapa Municipality had one-fifth of its respondents (20%) acknowledging receipt of training services, a little over ten percent of the respondents (14.3%) from the Wa West District also received training services from NGOs. On gender, whereas only female respondents (25%) from the Wa West District were trained, same proportion of only male respondents (25%) from the Jirapa Municipality received training support from NGOs. Generally, NGOs offer training on new methods and practices of farming and on marketing strategies for women (Yakubu et al., 2019). In communicating these training strategies such as farmer-field schools and demonstration lessons are adopted (Antwi-Agyei, 2021). When asked about the specific training received and how these have transformed their livelihoods and influenced the conception and perpetuation of migration, respondents through interviews and focus group discussions shared varied opinions. In a focus group discussion for instance, a participant indicated that World Vision International has organised meetings on several occasions to educate farmers on manure preparation and application, changing planting dates and where they could access improved seeds and how to sow them. He further explained how these training has positively affected their ability to adjust and adapt to the effects of climate change and subsequently shaping outmigration in the community. The discussant reported that:

*We have received lessons on preparation of manure and maybe the seasonal farming. If you want to farm you have to know the time you plant or you sow the crops; they taught us something like that. They also taught us how and where to get improved seeds; how to select your seeds. They told us it wasn't good to sow the seeds and then select some of the harvests to sow again [...]. From my observation, beneficiaries of these training programme particularly those on manure preparation and planting date adjustment, have witnessed remarkable improvement in crop yield even in the face of climate disturbances. This has resulted in a reduction in seasonal mass human migration from the community. There are people in this community that I personally know who always migrated to Kumasi during the dry season until NGOs started educating us (Male Focus Group Discussant, March, 2022, Siiru).*

The role of NGOs in shaping agrarian livelihoods and its implication for human migration is once again, evident in the account above. As beneficiaries applied the knowledge acquired from the training on these in-situ adaptation strategies, not only were they able to adapt to the impacts of climate, they also witnessed a boost in crop yields (Aniah et al., 2016; Antwi-Agyei, 2021; Baffour-Atta, 2021). The improvement in crop yield which possibly results in household income growth, food security and decline in poverty potentially discourages household members from migrating to the south for greener pastures. This result resonates with Mcleman's (2018) assertion that outmigration reduces as people build more adaptive capacity to the impact of climate change. It should, however, be noted that migration is also shaped by other intrinsic (aspirations) characteristics of the potential migrants (de Haas, 2021). The influence of NGOs in shaping migration in this context is alluded to the critical functions of the transforming structures and processes in determining the outcome of livelihood strategies adopted (DFID, 2005).

In affirming earlier responses from household members, a key informant of Action Aid, in the Upper West Region, stated that the organisation has been instrumental in enhancing agrarian livelihood through the provision of some farming inputs, training, sensitising and educating farmers on new methods of crop cultivation in particular. The informant, however, revealed that

to achieve its goals, the organisation works in collaboration with both private and public institutions. The views of the key informant are presented in the following statement:

*We train farmers on how to plant multiple or variety of crops. This is beneficial because if one crop (say maize) fails the other (say Soya) will not fail. The organisation also educates farmers on planting early maturing plants and changing planting dates. We train our women and small-scale farmers on compost production so that they can produce their own compost to fertilise their own farmlands. Some of these training are done based on the request of the beneficiary [...]. We also work hand in hand with the department of agriculture, SARI, UDS and District Assemblies to engage the communities in general on sensitization of bush fire prevention and tree cutting and facilitating their own action plans (Key Informant, Action Aid, July, 2023, Upper West Region).*

Aside from being trained on planting variety of crops, early maturing crops, and adjusting planting dates, that enabled farmers to adapt to negative effects of climate change, the training farmers received on compost preparation would not only be beneficial in terms of crop production, but can also serve as a means of diversifying income source. In that, farmers can be supported with start-up capital to enable them commercialise compost production (Yakubu et al., 2019). These multiple streams of income farmers are exposed to may compel them to stay and not migrate, as the socioeconomic needs that may push them away will be partly addressed.

In assessing the impacts of these strategic training programmes on outmigration, the key informant believed that largely Action Aid is contributing towards immobility of mostly the youth. In a more nuanced manner, the officer explained how the organisation seeks to reduce outmigration by empowering and making farmers more self-reliant through supporting their own livelihood initiatives. He gave an extensive account as presented in the following statement:

*We believe that because we have one rainy season in the north, labour during dry season will be idling and that forces people to move down south for greener pastures. We just don't provide help, we go through series of activities and training and sensitisation to appreciate that you make a livelihood of your choice. So within the*

*community, we have people who are rearing rabbit and others who are into shea butter and others in vegetable production. This has stopped them from migrating. For instance, in Jirapa, some of the young females said they used to travel to Accra or Kumasi just to do menial jobs because they did not have any income related activities in the community. [...]. What are the things that have market but do not exist in the local economy? So they will identify these things and based on that the training will be done for them, and we now provide them with start-ups. Based on these interventions, we have stories where someone will say for the past two years, I have not been travelling again. And even because of the income I have gotten new business channels now. I'm into another form of business such as small provision shops, selling of fuel, and not only the primary one Action Aid has supported me with **(Key Informant, Action Aid, July, 2023, Upper West Region)**.*

It could be observed from the above elaborate account that, the organisation is not only building farmers' resilience to climate change, but it is also devising a more sustainable means of shaping their livelihoods that will make them financially independent. This account is similar to the finding of Yakubu et al. (2019), where a number of NGOs in the northern region are assisting farmers to adapt to climate change by rolling out several livelihood transformation programmes. In this context it could be contended that as farmers become economically self-reliant through their own livelihood initiative programmes, the less likely they will aspire to migrate, particularly when the cost-benefit analysis favours their immobility decisions. This phenomenon conforms to the postulation of Jacobson et al. (2019) that, as climate affected households accumulate wealth through livelihood diversification, the more voluntary migration appeals to them. More so, the local economy will witness growth as farmers are empowered to develop multiple livelihood initiatives within their communities. The growth in the local economy will enhance the ability of households and communities to adapt to climate effects thereby enhancing their aspirations to stay instead of moving. On this basis, it could be claimed that the activities of NGOs are helping to reduce outmigration. This is a confirmation of Sibeon's (2004, p.53) supposition that structures (in this case NGOs) have the potentials to enhance human capabilities

(livelihood and migration). Nonetheless, other studies conducted in recent times have reported a high incidence of mostly youth outmigration in the region (GSS, 2021; Teye et al., 2021).

#### **6.2.4 Department of Agriculture (Agriculture Extension Section)**

At the decentralised level, the district/municipal agriculture department, which is made up of crops unit, animal production unit, women in agriculture department, agriculture engineering unit, and MIS section (MoFA, 2018), play crucial roles in climate change adaptation and migration (Antwi-Agyei, 2021). Although there are no clearly defined mandates of the department concerning migration, it undertakes a number of activities that implicitly shape migration decisions of local farmers in climate-affected areas. Notable among these activities are partaking in the provision of extension services on natural resource governance, rural infrastructural and small-scale irrigation in the districts and municipalities. Others are aid enactment and implementation of Agricultural Policy for the MMDAs within the ambit of national policies; advice the MMDAs on issues related to Agricultural enhancement in the Municipality; advance extension services to farmers; guide and partake in on-farm adaptive research; enhance the establishment of workable fishermen associations and assisting in farming fishes. Not only the above, but also an improvement in soil and water conservation measures by the appropriate agricultural technology; promote agro-forestry development to minimise the outbreaks of bush fires; encourage improvement in livestock breeds; assist in creating early warning systems on animal diseases; and advise and encourage crop development through nursery propagation (MoFA, 2018).

To assess the impact of the above elaborate activities on household livelihoods and outmigration, a key informant from the municipal agriculture department revealed that although there are several intervention programmes rolled out with the view of minimising outward mobility, the

attention and resources are channeled into fostering dry season irrigation farming. This according to him, was because majority of the people move during that period. The informant noted that this feat is achieved primarily through sensitisation, admonition and provision of inputs. The idea is that, once the people start making the same money for which they intend to migrate out of the community, they will have no reason to move. His report is presented below:

*Yes, I think apart from our sensitisations, because we are Agriculture, whatever we are telling them is about farming. So, we have started encouraging them to do dry season farming; where you will get engaged. Once you know you can equally get money here from agriculture without moving, you will not move. Initially, we started with the Black Volta, where we encourage people to go farm during the dry season; because there is so much land there. By way of input support, the department first of all, negotiates with the chiefs in the Black Volta enclave to grant access to farmlands along the river. We have also given solar powered mechanized machines to a couple of them. [...]. This and other supports the department gives just to encourage them to farm. Those who heeded this advice made a lot of money during that particular season hence did not migrate. However, those who did not see the sense in what we said still moved to the south during the dry season. ... (Key Informant, March, 2022, Jirapa).*

As a way of addressing their livelihood challenges for which they move, farmers were encouraged to engage in dry season vegetable farming along the bank of the Black Volta, where they had access to constant water supply to water their crops. In addition to this, the department meets with the chiefs in the communities along the Black Volta enclave to negotiate for the farmlands. This confirms the role of transforming structures in mediating households' access to livelihood assets, which shape strategies for appropriate livelihood outcome (Carney et al., 1999). Other inputs like solar powered mechanised machines, which enable famers to pump water from the river to water their crops were also provided. These strategies are supposed to enable farmers adjust and adapt in-situ to the long period of drought (Antwi-Agyei et al., 2021; SADA, 2016; Yaro et al., 2016). The data reveals that as people followed the admonition from the Officers, they stayed and farmed, however, those whose cost-benefit analysis (King, 2012),

favoured their migration aspirations declined the Officers' advise and migrated. This partly explains that people's migration decision is not shaped by only economic or monetary factors, but other drivers such as social, political and personal factors (Foresight, 2011; Lee, 1966). The unwillingness expressed by the farmers to accept the adaptation strategy proposed by the municipal agriculture department resonates with the fact that social actors, irrespective of how weak and lowly they appear, exude some degree of influence on the social structures that suppress them (Giddens, 1984; 72).

### **6.3 Chapter conclusion**

This chapter examined the role of national policies and local institutions in shaping livelihoods and migration of households. The first section analysed how livelihoods and outmigration of households were influenced by the selected national policies. The SADA policy was formulated as an alternative livelihood strategy to enable farmers adapt in-situ to climate change; to minimise poverty; and close the development gap between the northern and southern ecological zones and to consequently discourage outmigration (SADA, 2016). However, it was gathered that SADA's accelerated agricultural production for small-holders, which was less deficient at its formative stages, created few jobs and boosted livelihoods of some beneficiaries, was later saddled with budgetary constraints, inadequate staff, late planting times and marketing issues (Cao, 2017). The study further found that at the initial stages of its implementation outmigration declined, as beneficiaries of the policy were able to adapt in-situ to climate perturbations. On the contrary, as the policy grappled with the aforementioned challenges, which resulted in livelihood losses for some beneficiaries, people perceived outmigration as a viable livelihood alternative. This supports the argument that livelihood losses and outmigration are negatively related (see Birkmann et al., 2022; Ellis, 2000; Ribot et al., 2020). Notwithstanding, improvement in

livelihoods of households does not necessarily result in reduced outmigration. For instance, migration scholars have posited that as people develop, they build capabilities that shape their migration aspirations (de Haas, 2021; Martin & Taylor, 1996). Consistent with the Sustainable Livelihood Framework, the role of SADA, which constitutes the transforming structures and processes is significant in determining the outcome (improved livelihood and reduced outmigration) of the livelihood strategies adopted to deal with household vulnerability to climate change (Carney et al., 1999; DFID, 2005).

On the impact of NFSP on livelihoods, adaptation and outmigration, the study gathered two contradictory views. While institutional heads argued that the programme has positively shaped livelihood and adaptation hence reducing outmigration, other participants stated otherwise. According to the key informant, prior to the reintroduction of the programme, the region witnessed increased outmigration of the active labour force who were much involved in agriculture livelihoods, owing to decreased soil fertility, which led to poor crop yield and low household income. He, however, maintained that, after the programme was reintroduced, farmers experienced high crop yields, increased household income, adapted in-situ, and hence did not find outmigration attractive. Finding from the previous chapter of this study and current studies, however, discovered that the region still experiences high incidence of outmigration (GSS, 2021; Teye et al., 2021). Moreover, the informant failed to recognise that with slow-onset climate processes, migration is the product of a combination of multiple factors including aspirations and capabilities of the potential migrants (de Haas, 2021; Foresight, 2011; Martin, 2017). Other participants, on the contrary submitted that, the policy, due to challenges such as price hike; difficult accessibility; late distribution; and smuggling of fertilisers, had insignificant impact on crop farming and in-situ adaptation hence, triggering increased outmigration. Notwithstanding,

these participants also failed to appreciate the fact that livelihood failure due to these challenges will have negative impact on their migration aspirations and capabilities, except by drawing on a viable social network as their social capital (d Haas, 2021; Massey, 2019; Teye & Yeboah, 2015). This is relevant in appreciating the function of the transforming structures and processes (FSP) as it influences the viability and success of livelihood strategy used in realising the desired livelihood outcomes – improved livelihood and reduced outmigration (DFID, 2005).

The analysis of the 1V1D or the dam policy also showed that, livelihood situations were not improved, farmers could not adapt in-situ, and outmigration increased as climate impacts exacerbated. All the respondents including a key informant from the department of agriculture attributed this phenomenon to a plethora of factors. These factors, among other things, included lack of adequate government resources to construct more dams (MoFA, 2021), lack of maintenance of old dams (Swatuck, 2008), malfunctioning of the new dams due to poor construction—the dams have very small reservoirs and cannot store enough water for dry season irrigation farming (Owusu et al., 2021), the dams lack water channels through which water could be pumped to people’s farms (Teye et al., 2021), and politicisation of the dam policy. Meanwhile, the 1V1D policy was meant to facilitate all-year-round farming, improve household income, foster in-situ adaptation and ultimately reduce outward migration (MoFA, 2022). This mirrors the literature that irrigation significantly shapes households’ adaptability to the adverse effects of climate change (Adger et al., 2021; Alemayehu & Bewket, 2017). Nonetheless, Awuni et al. (2023) reported that as young adults failed to adapt in-situ to the effects of the dry season, the need to migrate for greener pastures became a reality to them. Reflecting Sibeon’s (2004, p.53) assumption that structures can constrain or enhance human agency, the analysis so far shows that the national policy on dams or 1V1D failed to enhance the ability of households to

engage in dry season farming and to adapt in-situ, hence intensifying the existing outmigration trends.

Similarly, on the 1D1F, respondents registered their discontents as the policy, which sought to create more jobs, improve standard of living of the rural poor and eventually reduce rural-urban migration, failed to achieve its objective. As agriculture livelihood losses emanating from climate impacts continues to exacerbate unemployment and poverty situations in the study areas (Fielmua, 2017; Tia et al., 2023), households perceived that the implementation of the 1D1F would offer alternative livelihood source that would enhance their abilities to adapt in-situ and minimise the incessant outmigration (Adu-Prah et al., 2019). Meanwhile, the literature reveals that only 1 out of the 9 proposed factories in the Upper West Region is completed and operational and employing only 210 people (Ofori-Atta, 2019). According to Adu-Prah et al. (2019), this development has intensified outward mobility. The conceptual framework of the study highlights this incident, where households' vulnerability is shaped by climate and non-climate hazards with transforming structures and processes (1D1F) shaping capabilities (assets) through job creation so as to enhance in-situ adaptation and further minimise outmigration (Carney et al., 1999; DFID, 2005). Though the implementation of this policy could have partly checked increased outmigration, historical antecedents and literatures indicate that outmigration in the region has always been high, as people have diverse motives for moving.

The second part of this chapter analysed the role of local institutions in shaping livelihoods and migration. Although several local institutions and actors were identified in the study areas, these four were key in the analysis; land tenure system, family and friends (informal actors), NGOs and District/Municipal Agriculture Department. Concerning traditional land tenure system, the findings showed that family/clan heads and tindanas are the owners and distributors of lands

among male children as their inheritance (Songsore, 2009). As it is difficult to own land from other families (including its purchase), farmers are compelled to over-cultivate the same parcel of land, which results in land fertility loss. The loss of land fertility coupled with drought account for livelihood losses, poor crop yield and low income (Antwi-Agyei et al., 2021). Households that suffer this fate may have slimmer chances to adapt in-situ and may subsequently embark on seasonal migration even though other factors may play out (see Codjoe & Atiglo, 2020; Fielmua, 2017; Kluger et al., 2020; Vinke et al., 2021). As important as this livelihood asset (land) is to households and communities, the transforming structures (traditional land tenure system) to a limited extent is shaping farmers' access and use of it (DFID, 2005).

Another informal local institution (actors) that shapes livelihoods and migration of households through the provision of food, input and money is family and friends. The survey revealed that family and friends mostly supported relatives with money as majority of the respondents (95.5%) who received the support affirmed. It was gathered from the study that the monetary support, which was migrant remittances enabled beneficiaries to purchase farm inputs like fertiliser, hire the services of tractors and pay farm wage labours. This raised both crop yield and income to an appreciable level of the recipients of such assistance and subsequently discouraged them from migrating. However, given the limited number of recipients of remittances (with relatively low amount) in the region (GSS, 2021; Teye et al., 2023), coupled with the current rise in input costs (Nuhu & Wale, 2023; Yakubu et al., 2019), it could be conteded that family and friends' support does not enhance livelihood activities of the majority and as such they are not able to adapt in-situ, thereby stimulating migration aspirations for the youth in particular. This implies that transforming structures can enhance the ability of some to adapt in-situ and stay put, and also

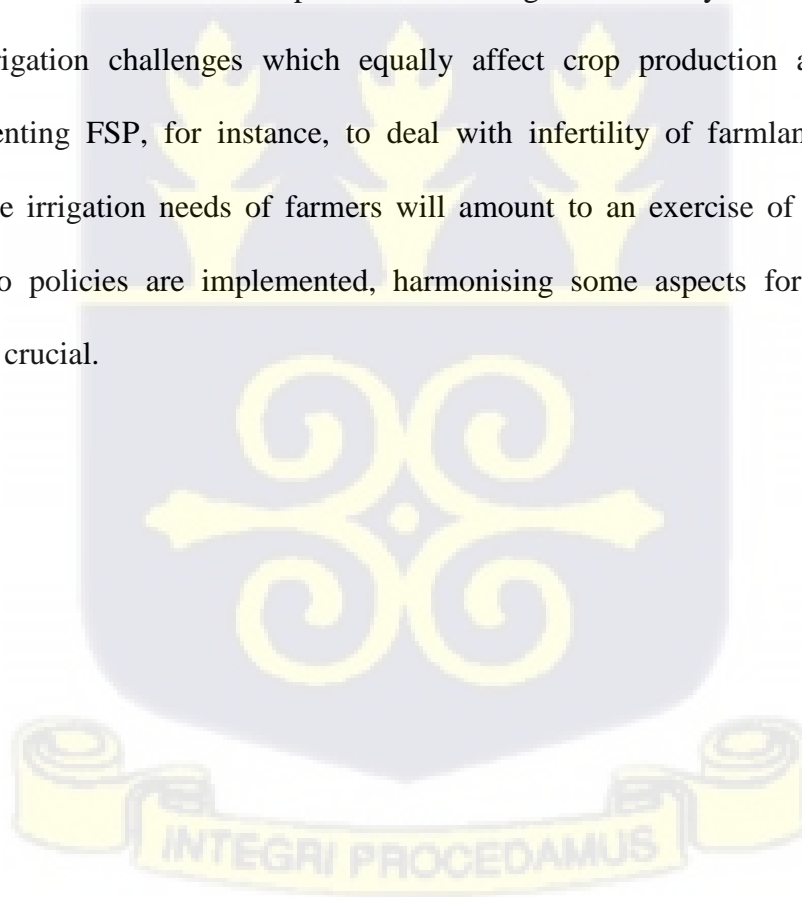
constrain the adaptability of others and hence enforcing their aspirations to migrate (Sibeon, 2004).

The influence of NGOs in the northern part of the country in terms of building resilience of climate-affected households is enormous. The study enlightens that the non-profit organisations supported farmers with input, training and money. Majority of the recipients (83.3%) of NGOs assistance, however, claimed to have received farming inputs such as fertilisers, seeds or seedlings and agrochemicals. It was reported that, prior to the receipt of these input supports, a number of peasant farmers could not engage in food crop production given the hike in the prices of these inputs coupled with the level of poverty that engulfs them. The study further gathered that beneficiaries of these input support schemes did not consider outmigration as a better livelihood alternative, hence stayed put. Though literature on NGOs influence on climate-related mobility is scanty, Harris et al. (2021) and Yakubu et al. (2019) affirm this finding by indicating that as agrarian livelihoods are enhanced through input support and training programme, the active labour force in particular stay put in order to focus on farm activities. The influence of NGOs in shaping migration in this context alludes to the critical functions of the transforming structures in determining the outcome of the livelihood strategies adopted (Carney et al., 1999).

Lastly, the agriculture officer at the municipal agriculture department in the Jirapa Municipality indicated that the department is encouraging and resourcing farmers to engage in dry season farming, as the department has realised that outmigration is high during that period. He stated that majority of the people are not receptive to the strategy hence are always migrating. Farmers who were not receptive to the programme might have done cost-benefit analysis of their movements and realised that the result favoured their movements than staying put (see King, 2012; Massey, 2018). The reluctance exhibited by the farmers in adhering to the adaptation

strategy rolled out by the municipal agriculture department resonates with the fact that social actors, irrespective of how weak and lowly they appear, still exude some degree of influence on the social structures that suppress them (Giddens, 1984; 72).

In relation to the above discussions, I submit that no single development policy can explicitly shape household livelihoods and migration in response to climate change. This is because of the intricate relationship between climate change and migration. As households suffer multiple stressors that shape livelihood and ultimately shaping outmigration flows, it is important that comprehensively all these aspects are concurrently tackled. For instance, it is possible that households and communities that experience declining soil fertility are at the same time experiencing irrigation challenges which equally affect crop production and outmigration. Hence, implementing FSP, for instance, to deal with infertility of farmlands alone without policies to tackle irrigation needs of farmers will amount to an exercise of futility. Instances where these two policies are implemented, harmonising some aspects for complementarity purposes will be crucial.



## CHAPTER SEVEN

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 7.0 Introduction

As the impacts of climate change on livelihoods are getting severer due to increased emission of greenhouse gases triggered by anthropogenic and natural factors, particularly in sub-Saharan African countries, several adaptation strategies are employed to deal with the phenomenon. Migration has been one of the strategies adopted by households whose livelihoods are disrupted by climate change to cope with the effects. Whereas most studies done so far have examined in-situ adaptation strategy, and the relationship between climate change and migration, little is known of how governance shapes climate change and migration. To contribute to the climate change and migration literature, this study examined the relationship between governance, climate change and migration.

The study adopted the Structuration theory and the DFID Sustainable Livelihood Framework as its theoretical perspective and conceptual framework respectively. The study, which was conducted in the Wa West District and Jirapa Municipality of the Upper West region of Ghana, employed the Sequential Explanatory Mixed Method Design for data collection and analysis. While the quantitative study comprised of 300 respondents through a survey, the qualitative study comprised of 25 participants through in-depth interviews and 7 focus group discussions. The study adopted the ethical clearance obtained by the GCM project from the Internal Review Board (IRB) of the University of Ghana, Legon. This chapter summarises the key findings of the study coupled with conclusions drawn from them. It also gives recommendations for future studies and to shape climate migration governance.

## 7.1 Summary

The summary of the main findings from the study are discussed below

### 7.1. 1 Experiences of climate change and its impacts on livelihoods

The data collected from the survey, focus group discussions and interviews on household livelihoods identified crop farming as the major livelihood predominantly engaged in by majority of the male respondents (91.1%). Although the survey revealed that a greater proportion of the female respondents (89.3%) also engaged in the said livelihood activity, responses from the interviews had it that women primarily played supporting role to their male partners, as per the customs, women cannot exercise ownership right over farmlands until after the demise of their male partners.

Findings from the study, which also resonate with available literature, revealed that irregular rains is the dominant climatic hazard experienced by nearly all the respondents (99.3%). The Chi-square test shows no significant statistical difference between the proportions of respondents that experienced the hazard in both study assemblies. This phenomenon implies that irregular rain is a major problem. Notwithstanding, report from the interviews and focus group discussions has it that some farmers with the assistance of NGOs and Agriculture Extension Officers are adapting by changing planting dates. The data, again, showed that because of irregular rains and long period of drought, flood was reported by only 4% of the respondents as the least dominant climatic hazard.

Regarding non-climate related hazards, the study discloses that decreasing soil fertility is the major hazard as the highest proportion of the respondents (98.7%) experienced it across the entire study areas. However, within the same region, the proportion that experienced this hazard in the Wa West District (99.3%) slightly exceeded the proportion that reported the same

experience in the Jiarap Municipality (98%). The Chi-square analysis found this difference as statistically insignificant between households across the two assemblies. This by implication signifies the severity of the phenomenon within the study areas. To minimise the impact of this hazard on their livelihoods, farmers resorted to the application of soil amendment to enhance agricultural output. Nonetheless, these soil amendments were found to be more expensive and inaccessible to farmers. From the data, conflict over land was discovered as the least prevalent non-climate related hazard as this was experienced by only 10.7% of the respondents. Given that land plays a crucial role in shaping livelihoods, adaptation and migration of climate affected households, this finding is a positive signal for boosting crop production even though lands in the communities are increasingly becoming infertile.

The concluding part of this chapter looked at the combined analysis of the impacts of climate and non-climate related hazards on household livelihoods. The quantitative survey disclosed that crop production was severely hampered by incessant decline in the fertility of farmlands. Almost all the respondents (98.2%) reported this across the various communities of study. This phenomenon was linked to the impacts of climatic hazards like drought and irregular rains on farmlands (Antwi-Agyei et al., 2021; Derbile et al., 2022). Accounts from the qualitative study showed that this situation has resulted in outmigration due to low agriculture output, food insecurity and small household income. Contrary to this, floods were reported by only 3% of the respondents to have caused the least impact on crop cultivation. Concerning the impacts of climate and non-climate related hazards on other livelihood sources, the findings record petty trading and fishing to have been adversely affected by declining soil fertility, while floods had the least negative impacts on other livelihoods. It was discovered that households adversely

affected by climate and non-related hazards were not likely to vary livelihood sources as the phenomenon affected petty trading, the second most practiced livelihood (Table 4.2).

### **7.1.2 Migration as a coping and an adaptation strategy to deal with the adverse effects of climate change**

The analysis of the historical antecedents of migration in relation to climate change, first of all revealed that, the phenomenon has always been a livelihood diversification strategy even prior to the colonial rule in the Upper West region (Goody, 1967; Lentz (2006). It was discovered that migration during the pre-colonial, post-colonial and post-independence eras was underpinned by a combination of climate and environmental, economic, social and political factors (Van der Geest, 2011; Songsore, 2006). For instance, in the pre-colonial era, migration in search of a fertile land for farming and to escape from conflict and slave raiders reveals the impacts of environmental and political factors at play. This agrees with Foresight's (2011) postulation that migration is a multidimensional social transformational phenomenon.

The study discovered that outmigration in the region is still persisting given that majority of the respondents (63.7%) had more household members migrating, a phenomenon they linked to rising negative effects of climate related hazards on their livelihoods (irregular rains, drought and declining soil fertility). The trend, which was more prevalent in the Jirapa Municipality than the Wa West District, also had more female respondents reporting the incident than male respondents. Concerning reasons for which people migrated, economic reasons emerged the topmost as approximately forty-three percent moved in search of or to hustle for better economic opportunities. The distribution at the district level revealed that, economic reasons for migration resonated more with migrants in the Wa West District (49.3%) than those in the Jirapa Municipality (36.6%), and among a higher proportion of males than females. Aside from

historical antecedent that reveals male dominance in migration flows, the form of hustling such as head portage (kayayei), illegal mining (galamsey), and waged farm labour work ('paa' oo 'paa'), identified through the qualitative study, partly accounted for increased male outmigration. For instance, the study indicated that males were increasingly moving to illegal mining (galamsey) sites to undertake such activities as they claimed it provides quicker avenue for making money. It was, moreover, revealed that migration in relation to climate hazards was rather minimal given that drought and floods altogether resulted in the movement of only 1.6% of the outmigrant population. Surprising as it may appear considering the severe impact of climate hazards in the region, the phenomenon confirms the minimalist's perspectives on migration stemming from climate change (McLeman, 2018; Ribot et al., 2020). A nuanced analysis of the qualitative data enlightened that the region experiences increased seasonal outmigration during the dry season as many farmers lack the financial capacity to undertake dry season irrigation farming. This reason, moreover, resulted in outward mobility to mainly rural settlements by 45.5% of the respondents across the entire areas.

As a temporary strategy to cope with the adverse effects of climate change on their livelihoods, nearly half (48.3%) of the out-migrant population adopted internal seasonal migration. Highlighting this during interviews and focus group discussions, participants revealed that as prolonged drought erodes farmers' livelihoods, crop yield, food security and household income, household members particularly the youth, move seasonally for about three to four months to destinations where they engage in menial jobs. Out of this, seasonal migrants are able to acquire basic items such as food and other farming inputs on their return to engage in farming during the rainy season. These seasonal migrants at the end of the farming season move back to the destinations to continue the hustling until the next farming season.

In a more proactive and reactive manner, household used migration as an adaptation strategy to deal with negative effects of climate change on livelihoods. This was done primarily through the receipt and use of migrant remittances either mainly, partly, or not at all on food, healthcare, education, farming inputs, livestock rearing and house construction. The survey data showed that the greater proportion (76.4%) of household that received remittances partially spent it on food. Expending remittances on food, according to climate migration literature, forms the basis of building resilience against adverse effects of climate change (Banerjee et al., 2017; Vinke et al., 2022). Moreover, given the usefulness of farming inputs to climate affected household (Szaboova, 2023), it was surprising to note that nearly half (46%) of the remittance-receiving households across the entire study areas did not spend a dime of the amount received to acquire such. The data showed that households' use of remittances on long-term investment was insignificant, as a greater proportion (82.9%) of remittance-receiving households refused to spend a dime of remittance received on livestock rearing.

Lastly, on immobility, the data revealed that factors such as obligation at home and lack of funds respectively rendered 47.4% and 38.6% of some household members involuntary immobile.

### **7.1.3 The role of national policies and local institutions in shaping livelihoods and climate--induced migration**

As livelihoods form an important component in climate change adaptation and migration decisions of households, the role of policies in shaping both variables becomes indispensable. The study, which examined a number of national level policies in this regard found out that livelihood issues in northern Ghana, to a limited extent, were positively affected by the identified policies. It was discovered that from colonial era through to post-independence including the

1980s and '90s, policies formulated have widened the poverty and inequality gap between the north and the south through the concentration of development projects in the south (Bening, 2005). The improvement in socioeconomic situations in the south as against the north resulted in the perpetuation of the north-south migration. Within the same context, new policies have been formulated and implemented in the last one and half decades. Among these policies, this study adopted the Savanna Accelerated Development Authority (SADA), National Policy on Dams (1V1D), National Fertiliser Subsidy Programme (FSP), and One-District-One-Factory (1D1F). The analysis of these policies revealed that livelihoods, adaptation and migration not enhanced.

On SADA, it was discovered that due to challenges such as budgetary constraints, limited staff, late planting times and lack of market for agriculture produce, the policy could not maintain the initial progress it made hence, leading to increased outmigration of young adult farmers. Meanwhile, the policy was meant to enable households adapt in-situ to climate impacts, reduce poverty, and close development deficit between the northern and southern ecological zones and subsequently minimise outmigration. Pertaining to the FSP, the data gathered from interview participants disclosed that the policy at the initial stages of its implementation boosted crop production. This is attributed to increased subsidy on the fertiliser, thereby making it cheaper for farmers to purchase in large quantities. As agrarian livelihood was improved, many farmers had improved income and hence did not want to migrate. Confirming this assertion, a key informant from the Department of Agriculture in the Jirapa Municipality, maintained that the policy largely has reduced outmigration as it enhanced crop production. Other participants, however, revealed that the policy, due to higher prices of fertilisers caused by the subsidy slash, accessibility challenges, late distribution and smuggling, negatively affected crop production, hence making in-situ adaptation difficult and outward migration non-negotiable for young male adults. In

connection with the 1V1D policy, participants including a key informant from the Department of Agriculture in the Wa West District, registered that livelihood situations for majority of households were adversely affected as the policy failed to create the opportunity for farmers to adapt in-situ, therefore, causing more youth outmigration. On a similar tangent, farmers in the study areas were displeased with the implementation of the 1D1F policy, though it was intended to provide more jobs and reduce rural-urban migration. They made a hypothetical statement that there is no single beneficiary of the policy within the community.

Concerning local institutional role in shaping livelihoods and migration, traditional land tenure system, family and friends (informal actors), NGOs and District/Municipal Agriculture Departments were identified as pivotal. The general perception about the traditional land tenure system was that, although every family owns and controls their own lands, the system of land tenure does not enhance agrarian livelihoods. This is attributed to over-cultivation of the same parcel of land, which partly results in fertility loss of farmlands. The situation makes in-situ adaptation difficult leading to increased outmigration of mostly the youth. On family and friends, respondents indicated that outmigration did not appeal to the few individuals who received monetary assistance from their family and friends, as beneficiaries channeled part of the monies received into purchasing farming inputs, which boosted crop production. Participants maintained that due to differing life aspirations, even though some youths received this assistance, they still migrated. NGOs have tremendous impacts on livelihoods and adaptation practices of households adversely affected by climate change. This is through their input and monetary supports, and education and training programmes. According to interview participants, the input support such as fertilisers and improved seeds, and training programme including demonstration farms, and in-situ adaptation practices have yielded positive results for the beneficiaries. Respondents

claimed that beneficiaries whose crops were boosted with these practices at that period did not migrate. Buttressing this, a key informant from Action Aid, mentioned that their strategic programmes of supporting individual livelihood initiatives with start-ups of some farmers have contributed to immobility of these beneficiaries. The departments of agriculture at the districts, through their initiative of encouraging and providing inputs to some farmers to engage in dry season vegetable farming has enhanced in-situ adaptation of these few farmers henced minimising their outward mobility. However, many youth are still migrating because they rejected the proposed adaptation strategy from the district.

## **7.2 Conclusions**

This study examined the possible links between governance (national policies and local institutions), climate change and migration. The major linkage between climate change, migration and governance in the context of this study is loss of household livelihoods. Even though the study shows that livelihoods (particularly crop farming) are increasingly being lost to combined effects of climate and non-climate related hazards such as drought, irregular rains, decreasing soil fertility, livestock diseases and crop pest and diseases (Antwi-Agyei et al., 2021; Baffour et al., 2022; Codjoe & Atiglo, 2020; Derbile et al., 2022; Kebede, 2019), other studies have contended that the adverse impacts of these hazards on livelihood could be minimised if governance factors and actors were fervent with the implementation of effective and tailor-made adaptation and mitigation strategies (Adams, 2011; Benzie & Persson, 2019; Kural, 2021; Persson & Dzebo, 2019; Ribot et al., 2020; Teye et al., 2021). This is because climate change will contitually take a toll on the global ecosystem, and adversely affect lives and livelihoods (IPCC, 2022). Juxtaposing the findings of this study with the standpoint of existing literature, the study concludes that agrarian livelihood failures cannot be attributed to only severe climate

hazards, but much more to governance limitations. This phenomenon confirms a major tenet of the conceptual framework of the study, where transforming structures and processes (policies and institutions) play pivotal role in reducing household vulnerability to climate change through its efforts in mediating households' access to livelihood resources and devising efficient livelihood strategies (Carney et al., 1999).

To cope with and adapt to livelihood losses orchestrated by negative impacts of climate change, the study discovered that households adopted primarily seasonal migration as an alternative livelihood strategy (Awuse & Tandoh, 2016; Fielmua, 2017; Kluger et al., 2020). Although economic migration is predominant in the region as the study shows, this is attributed to the influence of climate and environmental factors. Given the rate at which people are moving out of the region in search of better economic opportunities, the study contends that governance role in terms of bolstering livelihoods and other socioeconomic variables such as poverty eradication and reducing unemployment is less effective. The fact that migration offers the opportunity for farmers to cope with and adapt to harsh climatic condition like prolonged drought in times of crop failure, food insecurity and unemployment (Awuse & Tandoh, 2016; Bawakyillenuo et al., 2016; Call & Gray, 2020; Vinke et al., 2022), principally through migrant financial remittances (Banerjee et al., 2017; Gemmene & Blocher, 2017; Musah-Surugu et al., 2018; Szaboova, 2023; Teye et al., 2023), as the study reveals, is evident of its significant contribution in building resilience of households and communities. However, it has been argued that governance role in shaping migration into an effective climate adaptation strategy is rather lacking (Baldwin et al., 2014; IOM, 2020; McLeman, 2019). This is because governance actors believe that the ability of households to use migration as a strategy to cope with climate vulnerabilities mirrors their potentials to address climate change and its impacts, hence the shirking of governments

responsibilities (Vinke et al., 2022). Another factor that accounts for this governance gap is the fact that, the concept of migration as climate change adaptation is yet to catch the attention of global governance actors in the context of policy formulation (Honarmand et al., 2019; IOM, 2020; Wiegler et al., 2019). This study contends that even though migration proves to be a significant coping and adaptation strategy at the micro and meso levels, its lack of recognition at the national and global levels may render it less effective. This account mirrors the relationship between the transforming structures and livelihood strategy of the Sustainable Livelihood Framework, which shows that for any livelihood strategy to deliver the desired outcomes, the role of the structures and processes is paramount (DFID, 2005).

The governance gap (lack of explicit policy and institutional framework) concerning climate-induced migration has necessitated a shift in governance focus onto the intervening factors between climate change and migration. In this context, governance of climate related issues is rather tilted more to shaping livelihoods and in-situ adaptation than migration (Hoffmann et al., 2022; Ribot et al., 2020; McLeman, 2019). This is attributed to the fact that migration is considered as a phenomenon embedded in other issue areas, hence, policy directives that shape these areas are intended to implicitly address migration issues (Betts, 2011; IOM, 2018). Aside from its embeddedness, migration, right from the global to the national levels, has been perceived as a negative phenomenon arguably stemming from migrant-host nation or community relationship postulations (UNHCR, 2019; Miller, 2019; Taylor et al., 2016). As a result, policies formulated are geared towards making people stay instead of facilitating their movements irrespective of the degree of vulnerability at the origin (IOM, 2020; UNHCR, 2019). It has been argued that, most governments believe that by promoting in-situ adaptation strategies such as providing irrigation facilities, distributing fertilisers and providing agriculture extension services

to farmers, then people will stay and not move (Bawakyillenuo et al., 2016; IOM, 2020; Persson, 2019; Warner et al., 2015). However, these policy interventions in most cases have not yielded the intended results as migration is on the increase due to its coping or adaptation verities. Moreover, migration is a multidimensional social phenomenon such that it is inappropriate to attribute human migration to a single driving force (de Haas, 2021; Foresight, 2011; Lee, 1966; Massey, 2019; Zickgraf, 2021). As discovered in this study, national policies such as the SADA, FSP, 1V1D and 1D1F were all designed and implemented to explicitly shape livelihood and in-situ adaptation in order to implicitly control outmigration of the active labour force from the northern region (Ofori-Atta, 2019; Owusu et al., 2021; MoFA, 2021; SADA, 2016; Teye et al., 2021). Notwithstanding, as the findings showed, this governance context did not significantly enhance livelihoods and in-situ adaptation, as outmigration particularly among the youth intensified (GSS, 2021). This is because, aside from people's aspirations and capabilities, potential migrants also have the opportunity to assess the outcome of the cost-benefit analysis of their migration decisions and choose migration instead of other adaptation strategies (Massey, 2019; Waldinger & Frankhauser, 2015). The study thus, concludes that existing national policies and local institutions (formal and informal), are not enhancing livelihoods and in-situ adaptation of the majority, hence, outmigration is adopted by the youth in particular as a coping mechanism to the impacts of climate change on household livelihoods.

### **7.3 Recommendations**

Climate change is severely affecting livelihoods of farming households. The study has revealed that a combination of climate and non-climate-related hazards affects livelihoods. However, decreasing soil fertility was identified as the major hazard that adversely affect livelihood activities of farming households. It is, therefore, recommended that MoFA, through its extension

officers, should educate local farmers on how climate-related hazards such as drought and irregular rainfall cause a decline in soil fertility, and the possible ways local farmers can help minimise the incidence of soil erosion.

As organic and chemical fertilisers help in boosting soil fertility for increased crop yields, it is recommended that MoFA revises its Fertiliser Subsidy Programme by upscaling subsidies on both organic and inorganic fertilisers to reduce their prices per a bag, reintroducing the postpaid system, making the fertiliser easily accessible to farmers, checking smuggling, avoiding late distribution and depoliticisation of the subsidy programme. To check smuggling, government could task custom and immigration officers to monitor the Ghana-Burkina Faso border and other unapproved routes through which the fertiliser gets to Burkina Faso. This will enhance agricultural livelihood and aid in-situ adaptation in the study areas.

The findings from the study indicate that economic factors are the main driving force of migration in the region. However, these factors have been triggered by a multiplicity of climate and environmental, sociocultural and political factors. This explains the complex relationship between climate change and migration. It is, therefore, important that MoE, MESTI, EPA and researchers communicate this complexity to farmers, policy makers, development partners and donor agencies through education, policy dialogues, symposiums and dissemination workshops. This is vital as the understanding of this complexity will help to attract the right policy intervention to deal with the actual causality of the phenomenon.

The findings again revealed that migration is adopted as a coping and an adaptation strategy by households to deal with the impact of climate change on their livelihoods. Moreover, the phenomenon has been part of humans since creation; as a result, formulating policies that will make people stay irrespective of the circumstances at the origin may not suffice. It is, therefore,

recommended that the government through the MELR, MoFEP and MESTI formulate policies that will facilitate outmigration, harness the benefits and minimise the cost of internal migration.

Finally, the findings revealed there is no single policy that explicitly govern climate related migration. However, the only policy framework that is expected to regulate all aspects of migration is the National Migration Policy, which is also not implemented yet. As this policy is not yet implemented because it requires the establishment of the Ghana National Migration Commission to spearhead its affairs, this study recommends that the MoFARI, the Ministry of the Interior (MI) and other agencies such as the Migration Unit (MU) facilitate the establishment of the GNMC to further trigger the operation of the NMP.



## REFERENCES

- Aasoglenang, A.T., Kanlisi, S. K., Naab, F. X., Dery, I., Maabesog, R., Maabier, E.B. & Naa-Obmuo, P. (2013). Land access and poverty reduction among women in Chansa in the North Western Region of Ghana. *International Journal of Development and Sustainability*, 2 (2), pp. 1580-1596.
- Abakisi, O. (2018). *Access of women to land, and household food security in the Nandom District of the Upper West Region of Ghana* (Doctoral dissertation).
- Abbas, M., Ribeiro, P. F., & Santos, J. L. (2023). Farming system change under different climate scenarios and its impact on food security: an analytical framework to inform adaptation policy in developing countries. *Mitigation and Adaptation Strategies for Global Change*, 28(8), 43.
- Abdul-Korah, G (2007) ‘‘Where Is Not Home? Dagaaba migrants in the Brong Ahafo Region, 1980 to the present’. *African Affairs* 106(422): 71-94.
- Abdul-Korah, G. B. (2011). ‘Now If You Have Only Sons You Are Dead’: Migration, Gender, and Family Economy in Twentieth Century Northwestern Ghana. *Journal of Asian and African Studies*, 46(4), 390-403.
- Abdul-Razak, M., & Kruse, S. (2017). The adaptive capacity of smallholder farmers to climate change in the Northern Region of Ghana. *Climate Risk Management*, 17, 104-122.
- Abebaw, W. A. (2019). Review on impacts of land degradation on agricultural production in Ethiopia. *J. Resour. Dev. Manag*, 57.
- Abe, O. (2010). Democratization and governance reforms in Ekiti State (Unpublished doctoral dissertation). University of Ibadan, Ibadan, Nigeria.
- Abobi, S. M., Alhassan, E. H., & Akongyuure, D. N. (2023). Managing reservoir fisheries: a critical look at reservoir physical environment. *Multidisciplinary Science Journal*, 5(1), 2023008-2023008.
- Abubakar, A., Ishak, M. Y., Makmom, A. A., & Danhassan, S. S. (2021). Climate Change and Smallholder Farmers in the Sahel: Adaptation and Resilience.
- Abugre, C. (1993). Behind the crowded shelves: An assessment of Ghana's structural adjustment experience. *Manoscritto inedito*.
- Abutima, T. K. (2019). North-South Internal Migration: Gendered Experiences and Coping Strategies of Left-Behind Spouses in Northern Region of Ghana (Doctoral dissertation, University of Ghana). *An Unpublished PhD Thesis Submitted to the Centre for Migration Studies, University of Ghana, Legon, Ghana*.

- Acemoglu, D., & Robinson, J. (2012). *Why nations fail: The origins of power, prosperity, and poverty*. New York, NY: Crown Business
- Acheampong, E. N., Ozor, N., & Sekyi-Annan, E. (2014). Development of small dams and their impact on livelihoods: Cases from northern Ghana.
- Acheampong, E.O.; Sayer, J.; Macgregor, C.J.; Sloan, S. (2021). Factors Influencing the Adoption of Agricultural Practices in Ghana's Forest-Fringe Communities.
- Acquah, H. D. G., Nunoo, J., & Darfor, K. N. (2015). Farmers' perceptions and adaptation to climate Change: evidence from Ghana. *Environment, Agriculture and Cross-Border Migrations. CODESRIA*, 35-52.
- Adams, A., & Cox, A. L. (2008). *Questionnaires, in-depth interviews and focus groups* (pp. 17-34). Cambridge University Press.
- Adaptation Learning Programme (ALP) and Care International (2015). *Climate Change Vulnerability and Adaptive Capacity in Northern Ghana*.
- Addaney, M., Boshoff, E. & Oyetola, B. (2017) 'The climate change and human rights nexus in African', Special Edition on the Environment and International Law. *Amsterdam Law Forum* 9(3), 5–28.
- Adekunle, R., Rasheed A. & Ashira R. (2017). Soil fertility challenges and Bio-fertiliser as available alternative for increasing smallholder farmer crop productivity in sub-Saharan Africa, *Cogent Food & Agriculture*.
- Adepoju, A. (1995). Migration in Africa. *The migration experience in Africa*, 202, 87.
- Adepoju, A. (Ed.). (2010). *International Migration within, to and from Africa in a Globalised World*. Sub-Saharan Publishers.
- Adger, W. N. and Barnett, J. (2005) 'Compensation for Climate Change Must Meet Needs', *Nature*, 436 /7049: 328.
- Adger, W. N., Agrawala, S., Mirza, M. M. Q., Conde, C., O'Brien, K., Pulhin, J., Takahashi, K. (2007). Assessment of adaptation practices, options, constraints and capacity. In M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linde, & C. E. Hanson (Eds.), *Climate Change 2007: Working Group III: Mitigation of Climate Change* (pp. 717–744). Cambridge, UK: Cambridge University Press.
- Adger, W.N., Campos, R. S. de, Codjoe, S. N. A., Siddiqui, T., Hazra, S., Das, S., Adams, H., Gavonel, M. F., Mortreux, C., & Abu, M. (2021). Perceived environmental risks and insecurity reduce future migration intentions in hazardous migration source areas. *One Earth*, 4(1), 146–157.

- Adu-Prah, S.; Appiah-Opoku, S.; Aboagye, D. (2019). Spatiotemporal evidence of recent climate variability in Ghana. *Afr. Geogr. Rev.* 2019, 38, 172–190
- Afifi, T. Liwenga, E and Kwezi, L. (2014). Rainfall-induced crop failure, food insecurity and out-migration in Same-Kilimanjaro, Tanzania. *Climate and Development*, 6(1), pp.53-60.
- Afful, K. N. (2016). Policies for technological development/innovation and the sustained economic growth of the Ghanaian economy. *Weshin Innovation, Accra, Ghana*.
- AgNRM. (2017). *Land tenure and natural resource access in Northern Ghana – with a focus on women*. Tamale, TA: Agriculture and Natural Resource Management: Feed The Future Project.
- Agrawal, A., & Perrin, N. (2008). Climate adaptation, local institutions and rural livelihoods. In *IFRI Working Paper #W081-6*. Michigan: International Forestry Resources and Institutions Program, University of Michigan.
- Ahinful, G., Boateng, F., & Oppong-Boakye, P. (2013). Remittances from abroad: The Ghanaian household perspective. *International Journal of Business and Social Science*, 4(1).
- Aleksandrova, M., Gain, A. K., & Giupponi, C. (2016). Assessing agricultural systems vulnerability to climate change to inform adaptation planning: an application in Khorezm, Uzbekistan. *Mitigation and Adaptation Strategies for Global Change*, 21, 1263-1287.
- Amfo, B., Shafiwu, A. B., & Tanko, M. (2022). Fertilizer subsidy in Ghana: a gain or loss of cocoa productivity? *International Journal of Productivity and Performance Management*.
- Anaglo, J. N., Boateng, S. D. & Boateng, C. A. (2014). Gender and Access to Agricultural Resources by Smallholder Farmers in the Upper West Region of Ghana. *Journal of Education and Practice*, 5 (5).
- Anang, B. T., & Owusu, R. (2023). Adoption Determinants and Productivity Effect of Improved Maize Technology in Tolon District Of Northern Ghana. *International Journal of Food and Agricultural Economics*, 11(3), 149-163.
- Aniah, P., Kaunza-Nu-Dem, M. K., Quacou, I. E., Abugre, J. A., & Abindaw, B. A. (2016). The effects of climate change on livelihoods of smallholder farmers in the upper east region of Ghana. *International Journal of Sciences: Basic and Applied Research*, 28(2), 1-20.
- Antwi-Agyei, P., Fraser, E.D.G., Dougill, A.J., Stringer, L.C., Simelton, E., (2012). Mapping the vulnerability of crop production to drought in Ghana using rainfall, yield and socioeconomic data. *Appl. Geograp.* 32, 324–334.
- Antwi-Agyei, P., Doegah, P. T., & Codjoe, S. N. A. (2019). The perceived impacts of climate change on agro-based and fishery-based livelihoods in the Savannah and Coastal Ecological Zones of Ghana. *Climate Change in Ghana*, 25.

- Antwi-Agyei, P.; Nyantakyi-Frimpong, H. (2021). Evidence of Climate Change Coping and Adaptation Practices by Smallholder Farmers in Northern Ghana. *Sustainability* 2021, 13, 1308.
- Antwi-Agyei, P., Dougill, A. J., Doku-Marfo, J., & Abaidoo, R. C. (2021). Understanding climate services for enhancing resilient agricultural systems in Anglophone West Africa: The case of Ghana. *Climate Services*, 22, 100218.
- Arango, J. (2004). Theories of International Migration. In D. Joly (ed.), *International Migration and the New Millennium*. Aldershot: Ashgate, 15-36. *Assessing the Evidence* (Geneva: International Organisation for Migration).
- Aryeetey, E., Mensah, E.J. & Owusu, G. (2009). *An analysis of poverty and regional inequality in Ghana*. GDN working paper series number 27, global development network (GDN), New Delhi.
- Asante, F. A., & Bawakyillenuo, S. (2021). *Farm-level effects of the 2019 Ghana planting for food and jobs program: An analysis of household survey data* (Vol. 57). Intl Food Policy Res Inst.
- Asare-Nuamah, P., Amungwa, A.F. (2021). Climate Change Adaptation among smallholder farmers in rural Ghana. In: Oguge, N., Ayal, D., Adeleke, L., da Silva, I. (Eds) *African Handbook of Climate Change Adaptation*.
- Asmamaw, D. K., Janssens, P., Dessie, M., Tilahun, S., Adgo, E., Nyssen, J., & Cornelis, W. M. (2022). Effect of integrated soil fertility management on hydrophysical soil properties and irrigated wheat production in the upper Blue Nile Basin, Ethiopia. *Soil and Tillage Research*, 221, 105384.
- Auffhammer, M. (2018). Quantifying economic damages from climate change. *Journal of Economic Perspectives*, 32(4), 33-52.
- Awedoba, A. K. (2008). *Cultural Sensitivity and Programming. The Case of Government of Ghana-UNFPA 5th Country Programme*.
- Awumbila, M. (2018). Dynamics of intra-regional migration in West Africa: Implications for ECOWAS migration policy. *Migration in a globalizing world: Perspectives from Ghana*, 9-30.
- Awumbila, M. Teye, J.K. and Yaro, J. A (2016). “Of Silent Maids, Skilled Gardeners and Careful Madams: Gendered Dynamics and Strategies of Migrant Domestic Workers in Accra, Ghana”, *Geojournal* DOI 10.1007/s10708-016-9711-5.
- Awumbila, M., Owusu, G. and Teye, J.K. (2014) *Can Rural-Urban Migration into Slums Reduce Poverty? Evidence from Ghana*. Brighton: University of Sussex, Migrating Out of Poverty Working Paper No. 13.

- Awuse, N., Agyei, J., & Tandoh-Offin, P. (2016). The cost-benefit analysis of migration from Northern to Southern Ghana. *Researchjournali's Journal of Economics*, 4(5), 1-15.
- Aydemir, A., & Duman, E. (2021). Migrant Networks and Destination Choice: Evidence from Moves across Turkish Provinces. IZA Discussion Paper No. 14677, Available at : <https://ssrn.com/abstract=3917292>
- Bäckstrand, K., & Kuyper, J. W. (2017). The democratic legitimacy of orchestration: the UNFCCC, non-state actors, and transnational climate governance. *Environmental Politics*, 26(4), 764-788.
- Baffour-Ata, F., Antwi-Agyei, P., Nkiaka, E. (2021). Climate Variability, Land Cover Changes and Livelihoods of Communities on the Fringes of Bobiri Forest Reserve, Ghana. *Forests* 2021, 12, 278. <https://doi.org/10.3390/f12030278>.
- Baird, R, Migiro K, Nutt D, Kwatra A, Wilson S, Melby J, Pendleton A, Rodgers M, Davison J  
Human tide: the real migration crisis (2007)
- Banerjee, S., Kniveton, D., Black, R., Bisht, S., Das, P. J., Mahapatra, B., & Tuladhar, S. (2017). Do Financial Remittances Build Household-Level Adaptive Capacity? A Case Study of Flood-Affected Households in India.
- Bariw, S. A., Kudadze, S., & Adzawla, W. (2020). Prevalence, effects and management of fall army worm in the Nkoranza South Municipality, Bono East region of Ghana. *Cogent Food & Agriculture*, 6(1), 1800239.
- Barnett, J. R., & Webber, M. (2010). Accommodating migration to promote adaptation to climate change. World Bank Policy Research Working Paper Series.
- Bawa, A. (2019). Agriculture and food security in Northern Ghana. *Asian Journal of Agricultural Extension, Economics & Sociology*, 31(2), 1-7.
- Baweje, P., Kumar, S., & Kumar, G. (2020). Fertilizers and pesticides: Their impact on soil health and environment. *Soil health*, 265-285.
- Bawakyillenuo, S., Awetori Y. J. & Teye J. (2016). Exploring the autonomous adaptation strategies to climate change and climate variability in selected villages in the rural northern savannah zone of Ghana, Local Environment: The International Journal of Justice and Sustainability. Berlin, Heidelberg.
- Bebelleh, F. D. (2008). *Land tenure security for the rural poor and marginalised under Ghana's land Administration project (LAP): A Case Study of Communities in the Upper West Region* (Doctoral dissertation).
- Bekye, P. (1998). Peasant development: The case of northern Ghana. Leuven: ACCO.

- Bening, R. B. (2005). *The University for Development Studies in the history of higher education in Ghana*. Accra: Hish Tahwah Publications.
- Benzie, M., & Persson, A. (2019). Governing borderless climate risks: Moving beyond the territorial framing of adaptation. *International Environmental Agreements: Politics, Law and Economics*, 19(4–5), 369–393. <https://doi.org/10.1007/s10784-019-09441-y>
- Berrang-Ford, L., Ford, J. D., & Paterson, J. (2011). Are we adapting to climate change? *Global Environmental Change*, 21(1), 25–33.
- Betts, A. (2011). (Eds) *Global Migration Governance* Oxford: Oxford University Press.
- Bettini, G. (2017). Where next? Climate change, migration, and the (bio) politics of adaptation.
- Bhaskar, R. (2013). *A realist theory of science*. Routledge.
- Bhatta, G. D., Aggarwal, P. K., Kristjanson, P., & Shrivastava, A. K. (2015). Climatic and non-climatic factors influencing changing agricultural practices across different rainfall regimes in South Asia. *Current Science*, 110(7), 1272–1281.
- Biermann, F., Boas I. (2012) *Climate Change and Human Migration: Towards a Global*
- Biesbroek GR, Klostermann JE, Termeer CJ, Kabat P (2013). On the nature of barriers to climate change adaptation. *Reg Environ Change* 13(5):1119–112.
- Bird, N., Watson, C., & Schalatek, L. (2017). *The Global Climate Finance Architecture (Climate Funds Update)*. London, England: ODI and Heinrich Böll Stiftung.
- Birkmann, J., Liwenga, E., Pandey, R., Boyd, E., Djalante, R., Gemenne, F., Leal Filho, W., Pinho, P.F., Stringer, L., & Wrathall, D. (2022). Poverty, Livelihoods and Sustainable Development. In Pörtner, H. O., Roberts, D.C., Tignor, M., Poloczanska, E.S., Mintenbeck, K., Alegría, A., Craig, M., Langsdorf, S., Löschke, S., Möller, V., Okem, A., Rama, B. (Eds.), *Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.
- Black, R., D. Kniveton and K. Schmidt-Verkerk (2011). “Migration and Climate Change: Towards an Integrated Assessment of Sensitivity”, *Environment and Planning A*, 43, 431–450.
- Black, Richard, and Michael Collyer. 2014. ‘Trapped’ Populations: Limits on Mobility at Times of Crisis. In *Humanitarian Crises and Migration*. Edited by Susan F. Martin, Sanjula Weerasinghe and Abbie Taylor. London: Routledge, pp. 287–305
- Blinder, S. Allen, W. & Mcneil, R. (2017). *World Migration Report 2018*.
- Boas, I., Farbotko, C., Adams, H., Sterly, H., Bush, S., van der Geest, K., & Blondin, S. (2019). Climate migration myths. *Nature Climate Change*, 9(12), 901–903.

- Boano, C., Zetter, R., and Morris, T., (2008). Environmentally displaced people: understanding the linkages between environmental change, livelihoods and forced migration. Forced Migration Policy Briefing 1, Refugee Studies Centre, Oxford.
- Boateng, A. (2012). Survival voices: Social capital and the well-being of Liberian refugee women.
- Boko, M., Niang, I., Nyong, A., Vogel, C., Githeko, A., Medany, M., Yanda, P. (2007). Africa. In M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden, & C. E. Hanson (Eds.), *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (pp.433–467).Cambridge, United Kingdom: Cambridge University Press.
- Boncour, P., Burson B. (2009). Climate change and migration in the South Pacific region: policy perspectives. *Policy Q* 5(4):13–20. <https://doi.org/10.26686/pq.v5i4.4312>
- Boone, C. (2013). Land regimes and the structure of politics: patterns of land-related conflict. *Africa*, 83(1), 188-203.
- Botai, C. M., Botai, J. O., Dlamini, L. C., Zwane, N. S., & Phaduli, E. (2016). Characteristics of droughts in South Africa: a case study of free-state and North West Provinces. *Water*, 8(10), 439.
- Boyd, E., Cornforth R., J., Lamb P. J, Tarhule A., Lélé M. I, Brouder A. (2013). Building resilience to face recurring environmental crises in African Sahel. *Nat Clim Change* 3(7):631–6.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Breinl, K., Di Baldassarre, G., Mazzoleni, M., Lun, D., & Vico, G. (2020). Extreme dry and wet spells face changes in their duration and timing. *Environmental Research Letters*, 15(7), 074040.
- Brown, O., (2008). Migration and climate change. International Organisation for Migration (IOM): Research Series No. 31, IOM, Geneva.
- Bryman, A. (2001). *Social Research Methods* (London, England: Oxford University Press.
- Bui, M., & MacDowell, N. (Eds.). (2022). *Greenhouse Gas Removal Technologies*. Royal Society of Chemistry.
- Burrows, K.; Kinney, P.L. (2016). Exploring the Climate Change, Migration and Conflict Nexus. *Int. J. Environ. Res. Public Health*

- Call, M., & Gray, C. (2020). Climate anomalies, land degradation, and rural out-migration in Uganda. *Population and Environment*, 41, 507–528. <https://doi.org/10.1007/s11111-020-00349-3>.
- Cannon, T., et al. (2003). *Social Vulnerability, Sustainable Livelihoods and Disasters: Report to DFID Conflict and Humanitarian Assistance Department and Sustainable Livelihoods Support Office*. London: University of Greenwich, Natural Resources Institute. Retrieved from: [http://www.benfieldhrc.org/disaster\\_studies/projects/soc\\_vuln\\_sust\\_live.pdf](http://www.benfieldhrc.org/disaster_studies/projects/soc_vuln_sust_live.pdf).
- Cao, J. (2017). *An Economic Analysis of Ghana's Savannah Accelerated Development Program* (Doctoral dissertation).
- Carlsson, L. and Sandström A (2008). Network governance of the commons. *International Journal of the Commons* 1(2): 33–54
- Carney, D. (1999). *Sustainable Livelihoods Approaches: Progress and Possibilities for Change*.
- Carney, D., Drinkwater, M., Rusinow, T., Neefjes, K., Wanmali, S., and Singh, N. (1999). *Livelihoods Approaches Compared*, DFID, London.
- Carr, E.R. (2005). Placing the environment in migration: environment, economy, and power in Ghana's Central Region. *Environment and Planning A*. 37(5), pp, 925-946.
- Chambers, R. & Conway, G. (1992). "Sustainable Rural Livelihoods: Practical Concepts for the 21st Century". IDS Discussion Paper Number 296, Institute of Development Studies.
- Chemura, A.; Bernhard, S.; Christoph, G. (2020). Impacts of climate change on agro-climatic suitability of major food crops in Ghana. *PLoS ONE* 2020, 15, e0229881.
- Chenoweth, E. (2014). Civil Resistance: Reflections on an Idea Whose Time Has Come. *Global Governance*, 20(3), 351–358. <http://www.jstor.org/stable/24526217>.
- Chevallier, R., & Chesterman, S. (2022). Enhancing the operationalization of the African Union's climate change and resilient development Strategy and action Plan (2022-2032).
- Christian Aid, (2007). *Human Tide: The Real Migration Crisis* (London: Christian Aid).
- Cleveland, D. A. (1991). Migration in West Africa: a savanna village prespective. *Africa*, 61(2), 222-246.
- Climate and Migration Coalition (2015). *Visualising migration and climate change: What can web and social media data tell us about public interest in migration and climate change?* Oxford: *Climate and Migration Coalition*.
- Cloke, P., & Johnston, R. (2004). *Spaces of Geographical Thought: Deconstructing Human Geography's Binaries*. SAGE.

- Cloke, P. J., Philo, C., & Sadler, D. (1991). *Approaching human geography: An introduction to contemporary theoretical debates*. London: Paul Chapman. ISBN: 1 853 96 100.
- Cobbinah, P. B., & Anane, G. K. (2016). Climate change adaptation in rural Ghana: indigenous perceptions and strategies. *Climate and Development*, 8(2), 169-178.
- Codjoe, S. N. A., & Atiglo, D. Y. (2020). The Implications of Extreme Weather Events for Attaining the Sustainable Development Goals in Sub-Saharan Africa. *Frontiers in Climate*, 2, 592658. <https://doi.org/10.3389/fclim.2020.592658>
- Codjoe, S. N. A., Atidoh, L. K., & Burkett, V. (2012). Gender and occupational perspectives on adaptation to climate extremes in the Afram Plains of Ghana. *Climatic Change*, 110, 431-454.
- Collins, J. W., & O'Brien, N. P. (2003). *The greenwood dictionary of education*. Westport, Connecticut. London: Greenwood Press.
- Connolly-Boutin, L., & Smit, B. (2016). Climate change, food security, and livelihoods in sub-Saharan Africa. *Regional Environmental Change*, 16, 385-399.
- Conradson, D. (2005). "Focus groups". In Flowerdew, R. and Martin, D. (Eds) *Methods in Human Geography: A Guide for Students Doing a Research Project*, second edition (Harlow: Pearson Prentice Hall) pp 128-143.
- Considine, M. 1994. *Public Policy: A Critical Approach*. South Melbourne: Macmillan.
- Craib, I. (1992). *Anthony Giddens's structuration*, Routledge a division of Routledge, Chapman and Hall Inc.
- Creswell, J. (2014). *Research design Qualitative Quantitative and Mixed Approaches*. SAGE Publications, Inc. 2455 Teller Road Thousand Oaks, California 91320
- Cresswell, T., & Merriman, P. (Eds.). (2011). *Geographies of mobilities: Practices, spaces, subjects*. Gower House. Hampshire: Ashgate Publishing, Ltd.
- Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative & Mixed methods Approaches, 3rd ed.* SAGE Publications. Inc., Thousand Oaks, California.
- Creswell, J. W., Tashakkori A. (2007). Developing publishable mixed methods manuscripts [editorial]. *Journal of Mixed Methods Research*, 1(2), 107-111.
- Crossman, J. (2021). Qualitative research writing: surveying the vista. *Handbook of Qualitative Research Methodologies in Workplace Contexts*, 190.
- Das, D. (2016). Changing climate and its impacts on Assam, Northeast India. *Das Bandung Journal of the Global South*, 2(26), 1-13.

- Debela, N., Mohammed, C., Bridle, K., Corkrey, R., & McNeil, D. (2015). Perception of climate change and its impact by smallholders in pastoral/agropastoral systems of Borana, South Ethiopia. *SpringerPlus*, 4(1), 236. <https://doi.org/10.1186/s40064-015-1012-9>
- De Haas, H. (2021). A theory of migration: the aspirations-capabilities framework. *Comparative migration studies*, 9(1), 1-35.
- Derbile, E. K., Chirawurah, D., & Naab, F. X. (2022). Vulnerability of smallholder agriculture to environmental change in North-Western Ghana and implications for development planning. *Climate and Development*, 14(1), 39-51.
- DFID, (2005). Sustainable Livelihoods Guidance Sheets. Department for International Development (UK). London.
- De Vaus, D., & de Vaus, D. (2013). *Surveys in social research*. Routledge.
- Devereux, S. (2006). Vulnerable Livelihoods in Somali Region, Ethiopia. Institute of Development Studies Research Report 57.
- Dietz, A. J, D. Millar, S. Dittoh, F. Obeng and E. Ofori-Sarpong (2004). “Climate and Livelihood Change in North East Ghana” in A. J. Dietz, R. Ruben, and A. Verhagen (Eds.). *The Impact of Climate Change on Drylands with a Focus on West Africa* (Dordrecht: *Kluwer Academic Publishers*), 149–172.
- Dilling, L., Daly, M. E., Travis, W. R., Wilhelmi, O. V., & Klein, R. A. (2015). The dynamics of : Why adapting to climate variability will not always prepare us for climate change. *Wiley Interdisciplinary Reviews: Climate Change*. <https://doi.org/10.1002/wcc.341>
- Dittoh, S. (2004). Land tenure, traditional institutions and sustainable development in Northern Ghana within the context of the national land policy. *Ghana Journal of Development Studies*, 1(1), 61-71.
- Domínguez-Mujica, J., Díaz-Hernández, R., & Parreño-Castellano, J. (2016). Migrating abroad to get ahead: the emigration of young Spanish adults during the financial crisis (2008–2013). *Global change and human mobility*, 203-223.
- Dougill, A. J., Fraser, E. D., & Reed, M. S. (2010). Anticipating vulnerability to climate change in dryland pastoral systems: using dynamic systems models for the Kalahari. *Ecology and Society*, 15(2).
- Doyle, S. (2007). Member checking with older women: A framework for negotiating meaning. *Health care for women international*, 28(10), 888-908.
- Duncan, B. A. and Brants, C. (2004). *Access to and control over land: From a gender Perspective. A study conducted in the Volta Region of Ghana*. Accra: The Printer Press.

- ECOWAS – Economic Community of West African States (1979). Protocol Relating to Free Movement of Persons. Residence and Establishment. A/P.1/5/79. Dakar, 29 May 1979. Available at: <http://ecowasmigration.ug.edu.gh/wpcontent/uploads/2015/03/ECOWAS->
- Egyir, I. S., Owusu, K., Jatoe, J. B. D., & Wrigley-Asante, C. (2014). Climate change and agricultural adaptation measures in the transition zone of Mid-Ghana. *Journal of Agricultural Research*, 2(3), 23-66.
- Elliott, M., Day, J. W., Ramachandran, R., & Wolanski, E. (2019). A synthesis: what is the future for coasts, estuaries, deltas and other transitional habitats in 2050 and beyond? *In Coasts and Estuaries* (pp. 1-28). Elsevier.
- Ellis, F. (2000). *Rural Livelihoods and Diversity in Developing Countries*; Oxford University Press: Oxford, UK, 2000.
- Elum, Z. A., Modise, D. M., & Marr, A. (2017). Farmer's perception of climate change and responsive strategies in three selected provinces of South Africa. *Climate Risk Management*, 16, 246-257.
- EPA, (2007). *Climate change and the Ghanaian economy. Policy Advice Series Ghana*. Environmental Protection Agency. Ghana Government, Accra, Ghana.
- EPA, (2011). *Ghana's Second National Communication to the UNFCCC*. Accra.
- Eriksen, S.H.; Brown, K.; Kelly, P.M. (2005). The dynamics of vulnerability: Locating coping strategies in Kenya and Tanzania. *Geogr. J.* 171, 287–305.
- Erman, A., S. Robbe, S. Thies, K. Kabir, and M. Maruo. (2021). *Gender Dimension of Disaster Risk and Resilience*. Washington, DC: Global Facility for Disaster Reduction and Recovery, World Bank Group.
- Etwire, P. M., Buah, S., Ouédraogo, M., Zougmore, R., Partey, S. T., Martey, E., & Bayala, J. (2017). An assessment of mobile phone-based dissemination of weather and market information in the Upper West Region of Ghana, *Agriculture & Food Security*, 6(1), 1-9.
- FAO, (2017). *The future of food and agriculture: Trends and challenges*.
- FAO, (2019). *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*. Rome. Licence: CC BY-NC-SA 3.0 IGO.
- Farrington, D. P. (2003). Developmental and life-course criminology: Key theoretical and empirical issues-the 2002 Sutherland Award address. *Criminology*, 41(2), 221-225.
- Feitelson, E., & Tubi, A. (2017). A main driver or an intermediate variable? Climate change, water and security in the Middle East. *Global environmental change*, 44, 39-48.

- Felli, R. (2013) ‘Managing Climate Insecurity by Ensuring Continuous Capital Accumulation: “Climate Refugees” and “Climate Migrants,”’ *New Political Economy*, 18/3: 337–363.
- Fielmua, N., Gordon D. Darius M. (2017). Migration as an Adaptation to climate change. *Journal of Sustainable Development*; Vol. 10, 6.
- Fink, L. D. (2013). *Creating significant learning experiences: An integrated approach to designing college courses*. John Wiley & Sons.
- Foresight, (2011). Final Project Report: *Migration and Global Environmental Change London: The Government Office for Science*).
- Fosu-Mensah, B.Y., Manchadi A., and Vlek P. L. G. (2019). “Impacts of climate change and climate variability on maize yield under rain-fed conditions in the sub-humid zone of Ghana: a scenario analysis using APSIM,” *West African Journal of Applied Ecology*, 27(1), 108–126.
- Foucault, M. (1980). Power/Knowledge: Selected Interviews and Other Writings, 1972–77, Ed. C. Gordon. Brighton: Harvester Ghana’s Central Region. *Environment and Planning A*. 37(5), 925-946.
- Friedlingstein, P., Jones, M. W., O’sullivan, M., Andrew, R. M., Bakker, D. C., Hauck, J., & Zeng, J. (2022). Global carbon budget 2021. *Earth System Science Data*, 14(4), 1917-2005.
- Furio, C. (2017). *Conceptualising Politics: An introduction to Political Philosophy*. Routledge. P. 17
- Füssel, H.-M. (2007a). Adaptation planning for climate change: Concepts, assessment approaches, and key lessons. *Sustainability Science*, 2(2), 265–275.
- Geddes, A. (Ed.). (2011) *International Migration* (London: Sage)
- Gbetibouo, G. A. (2009). *Understanding Farmers’ Perceptions and Adaptations to Climate Change and Variability. The Case of the Limpopo Basin, South Africa* (No. 00849). Washington D.C.
- Gemenne, F. (2011). Why the numbers don’t add up: A review of estimates and predictions of people displaced by environmental changes. *Global Environmental Change*, 21, S41-S49.
- Gemenne, F., & Blocher, J. (2017). How can migration serve adaptation to climate change? Challenges to fessing out a policy ideal. *The Geographical Journal*, 183(4), 336–347 *Geographers*,
- Ghana Statistical Service (2021). “Population and housing census press release.

- Ghana Statistical Service—GSS (2020). Rebased 2013-2019 Annual Gross Domestic Product, GSS, Accra, Ghana. [www.statsghana.gov.gh](http://www.statsghana.gov.gh)
- Ghana Statistical Services (GSS), (2017). *Ghana Living Standards Survey 7 (GLSS)*, Available at: <https://statsghana.gov.gh/gsspublications.php?category=MTAwMjg3Mzk3NC4MDc=/webstats/1opr93rn5>
- Ghana Statistical Service (GSS), (2012) 2010 population and housing census. Accra: GSS.
- Ghana Statistical Service (2014). 2010 Population and Housing Census.
- Giddens, Anthony. (2009). *Sociology*, Polity press, Main street, USA.
- Giddens, A. (1984). *The Constitution of Society, Outline of the Theory of Structuration*. Polity Press, Cambridge.
- Giddens, A. (1986). *The Constitution of Society*. University of California Press. USA.
- Giddens, A. (1979). Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis. Berkley: University of California Press.
- Giddens, A. (1991). *Structuration theory: past, present and future*, in Christopher G.A. Bryant and David Jary (eds.): *Giddens' Theory of Structuration. A critical appreciation*. Routledge, London, 201-221.
- Giddens, A. (2000). *The Third Way and Its Critics*. Cambridge: Polity Press.
- Girvetz, E. H., Corner-Dolloff, C., Lamanna, C., & Rosenstock, T. S. (2017). 'CSA-Plan': strategies to put Climate-Smart Agriculture (CSA) into practice. *Agriculture for Development*.
- GoG, (2020). National Labour Migration Policy 2020-2024. Ministry of Employment and Labour Relations.
- Goody, J., & Goody, E. (1967). The circulation of women and children in Northern Ghana. *Man*, 2(2), 226-248.
- Goody, J. (2018). *Changing social structure in Ghana: Essays in the comparative sociology of a new state and an old tradition*. Routledge.
- Gray, C. L. (2010). Gender, natural capital, and migration in the southern Ecuadorian Andes. *Environment and Planning A*, 42(3), 678–696.
- Grolle, J. (2015). Historical case studies of famines and migrations in the West African Sahel and their possible relevance now and in the future. *Population and environment*, 37, 181-206.

- Hall, N. (2016). *Displacement, development, and climate change: International organizations moving beyond their mandates*. Oxon and New York: Routledge.
- Haris, S. M., Mustafa, F. B., & Raja-Ariffin, R. N. (2021). Roles of non-governmental organisations in the national climate change governance: A systematic literature review. *Journal of Administrative Science*, 18(2), 222-248.
- Hauser, R. M., & Featherman, D. L. (1973). Trends in the occupational mobility of US men, 1962-1970. *American Sociological Review*, 302-310.
- Herrero-Arias, R., Hollekim, R., & Haukanes, H. (2020). Self-legitimation and sense-making of Southern European parents' migration to Norway: The role of family aspirations. *Population, Space and Place*, 26(8), e2362.
- Hirons, M., Mehrabi, Z., Gonfa, T. A., Morel, A., Gole, T. W., McDermott, C., & Norris, K. (2018). Pursuing climate resilient coffee in Ethiopia—A critical review. *Geoforum*, 91, 108-116.
- Hoffmann, R., Dimitrova, A., Muttarak, R., Crespo Cuaresma, J., & Peisker, J. (2020). A meta-analysis of country-level studies on environmental change and migration. *Nature Climate Change*, 10(10), 904–912. <https://doi.org/10.1038/s41558-020-0898-6>
- Hoffmann, E. M., Konerding, V., Nautiyal, S., & Buerkert, A. (2019). Is the push-pull paradigm useful to explain rural-urban migration? A case study in Uttarakhand, India. *PLoS one*, 14(4), e0214511.
- Holland, J. & Campbell, J. (2005). Context and challenges for combining methods in development research, in Holland, J. and Campbell, J. (Eds), *Methods in Development Research: Combining Qualitative and Quantitative Approaches* ITDG Publishing, Rugby.
- Holt-Jensen, A. (1999). *Geography: History and Concepts*. 3rd ed. London: SAGE
- Holt-Jensen, A. (2009). *Geography, History and concepts: A Student's Guide*; SAGE Publications. <http://www.newsobserver.com/12/07/2011/1696110/petersons->
- Honyenuga, B. Q., & Wutoh, E. H. (2019). Ghana's decentralized governance system: the role of Chiefs. *International Journal of Public Leadership*, 15(1), 2-18.
- Hope, K. R. (2011). Climate change in the context of urban development in Africa. In B. Yuen & A. Kumssa (Eds.), *Climate Change and Sustainable Urban Development in Africa and Asia* (pp. 37–55). Berlin: Springer Science & Business Media.
- Houssou, N., K. Andam, and C. Asante-Addo (2017). “Can Better Targeting Improve the Effectiveness of Ghana's Fertilizer Subsidy Program? Lessons from Ghana and other Countries in Africa South of the Sahara.” IFPRI Discussion Paper 01605 February.

- Hugo, G. (2011). Future demographic change and its interactions with migration and climate change. *Global Environmental Change* 21(S1): S21–S33.
- Hugo, G. (1996). Environmental concerns and international migration. *International Migration Review*, 30(1), pp. 105–131.
- Hunter, L. M., Luna J. K., Norton R. M. (2015). Environmental dimensions of migration. *Annu Rev Sociol* 41:377–397. <https://doi.org/10.1146/annurev-soc-073014-112223>
- IDMC, (2021). “Assessing Urban Disaster Displacement Risk” February 2021.
- Ifejika-Speranza, C., Kiteme, B., Opondo, M. (2009). Adapting public agricultural extension services to climate change: Insights from Kenya. In Amsterdam Conference on the Human Dimensions of Global Environmental Change. *Journal of Immigrant & Refugee Studies* 8(4): 386–408.
- ILO, (International Labour Organization) (2020). “ILO Monitor: COVID-19 and the World of Work, Sixth Edition.” Briefing note, ILO, Geneva, September 23, 2020
- International Monetary Fund. Research Dept. (2015). *World Economic Outlook, October 2015: Adjusting to Lower Commodity Prices*. International Monetary Fund.
- IOM, (2018). 'Chad: Lake Region. Displacement Tracking Matrix (DTM) Report 2
- IOM, (2019a). 2019a Glossary on Migration. International Migration Law, No. 34. Available at [www.iom.int/glossary-migration-2019](http://www.iom.int/glossary-migration-2019).
- IOM, (2020), *Environmental Migration Portal-Environmental Migration*.
- IOM, (2022). World Migration Report. Geneva.
- Ionesco, D., Mokhnacheva D., Gemenne F. (2017). *The atlas of environmental migration*. Routledge, London.
- IPCC, (2007a). *Climate Change 2007: impacts, adaptation and vulnerability: contribution of Working Group II to the fourth assessment report of the Intergovernmental Panel*. (M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden, & C. E. Hanson, Eds.). Cambridge, UK: Cambridge University Press
- IPCC, (2007b). *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva: Intergovernmental Panel on Climate Change.
- IPCC, (2018). IPCC Special Report on the Impacts of Global Warming of 1.5 C - Summary for Policy Makers. Incheon, Korea.
- IPCC, (2019). *Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems*.

- IPCC, (2021). The physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfeld, O. Yelekçi, R. Yu and B. Zhou (Eds.)]. Cambridge University Press. In Press.
- IPCC. (2022). *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Cambridge, UK, Cambridge University Press.
- IPCC, (2014a). Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. In Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Field, C.B., Barros, V.R., Dokken, D.J., Mach, K. J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., Eds., Cambridge University Press: Cambridge, UK, 2014.
- Issahaku, A., B. B. Campion, and R. Edziyie (2016). Rainfall and temperature changes and variability in the Upper East Region of Ghana, *Earth and Space Science*, 3, 284–294.
- Jacobson, C., Crevello, S., Chea, C., & Jarihani, B. (2019). When is migration a maladaptive response to climate change? *Regional Environmental Change*.
- Jarawura, F. X., and Smith. L. (2015). "Finding the Right Path: Climate Change and Migration in Northern Ghana." p. 245-66 in *Dealing with Climate Change in the Coastal Savannah Zone of Ghana: In Situ Adaptation Strategies and Migration*, edited by Felicitas Hillman, Marie Pahl, Birte Rafflenbeul, and Harald Sterly. New York: Palgrave Macmillan.
- Jirapa Municipal Assembly, (2018). District Medium Term Development Plan. 2018 – 2021.
- Johnston, M. (2004). "Good governance: Rule of law, Transparency and accountability," *Colgate University, New York Journal of the Commons* 1(2): 33–54.
- Kakahy, A. N. N., Alshamary, W. F. A., & Kakei, A. A. (2021, May). The Impact of Forward Tractor Speed and Depth of Ploughing in Some Soil Physical Properties. In *IOP Conference Series: Earth and Environmental Science* (Vol. 761, No. 1, p. 012002). IOP Publishing.
- Kates, R.W.; Travis, W.R. Wilbanks, T.J. (2012). Transformational adaptation when incremental adaptations to climate change are insufficient. *Proc. Natl. Acad. Sci. USA* 2012, 109, 7156–7161.
- Kebede, A.; Kang, M.S.; Bekele, E. (2019). Advances in mechanisms of drought tolerance in crops, with emphasis on barley. *Adv. Agron.* 2019, 156, 265–314

- Kima, S. A., Okhimamhe, A. A., Kiema, A., Zampaligre, N., & Sule, I. (2015). Adapting to the impacts of climate change in the sub-humid zone of Burkina Faso, West Africa: Perceptions of agro-pastoralists. *Pastoralism*, 5(16), 1–14.
- King, D., Bird, D., Haynes, K., Boon, H., Cottrell, A., Millar, J., & Thomas, M. (2014). Voluntary relocation as an adaptation strategy to extreme weather events. *International journal of disaster risk reduction*, 8, 83-90.
- King, R. (2002). Towards a New Map of European Migration. *International Journal of Population Geography*, 8(2), pp. 89-106.
- King, R. (2012). Geography and Migration Studies: Retrospect and Prospect, *Population, Space and Place*, 18(2): 134-153.
- Kollmair & Gamper, (2002). Input paper for the Integrated Training Course of NCCR North-South Aeschiried, *Swifter land*
- Kotir, J. H. (2011). Climate change and variability in Sub-Saharan Africa: a review of current and future trends and impacts on agriculture and food security. *Environment, Development and Sustainability*, 13(3), 587–605.
- Krosnick, J. A. (2018). Improving question design to maximize reliability and validity. *The Palgrave handbook of survey research*, 95-101.
- Krueger, R. A., & Casey, M. A. (2002). *Designing and conducting focus group interviews* (Vol. 18).
- Krupocin, D. and Krupocin, J. (2020) "The Impact of Climate Change on Cultural Security." *Journal of Strategic Security* 13, no. 4
- Kudjey, A. (2014) <https://www.researchgate.net/publication/312607139>
- Kusakari, Y., Asubonteng, K. O., Jasaw, G. S., Dayour, F., Dzivenu, T., Lolig, V., & Kranjac-Berisavljevic, G. (2014). Farmer-perceived effects of climate change on livelihoods in Wa West District, Upper West Region of Ghana. *Journal of Disaster Research*, 9(4), 516-528.
- Kuu-ire, S. M. A. (2009). Poverty reduction in northern Ghana: A review of colonial and post-independence development strategies. *Ghana Journal of Development Studies*, 6(1), 175-203
- Kuuiire, V. Z., Mkandawire, P., Arku, G., & Luginaah, I. (2013). ‘Abandoning’ farms in search of food: Food remittance and household food security in Ghana. *African Geography Review*, 32(2), 125–139.

- Kwankye, S. O., Anarfi, J. K., Tagoe, C. A., & Castaldo, A. (2009). Independent North-South child migration in Ghana: The decision-making process. *Development Research Centre on Migration, Globalisation and Poverty, University of Sussex Working Paper T-29*.
- Laczko, F. and Aghazarm, C (Eds.) (2009). *Migration, Environment and Climate Change: Assessing the Evidence* (Geneva: International Organisation for Migration).
- Lau, H., Michel, M., LeDoux, J. E., & Fleming, S. M. (2022). The mnemonic basis of subjective experience. *Nature Reviews Psychology, 1*(8), 479-488.
- Lawson, E. T., Alare, R. S., Salifu, A. R. Z., & Thompson-Hall, M. (2020). Dealing with climate change in semi-arid Ghana: understanding intersectional perceptions and adaptation strategies of women farmers. *GeoJournal, 85*, 439-452.
- Leach, M., Mearns, R., & Scoones, I. (1999). Environmental entitlements: dynamics and institutions in community-based natural resource management. *World development, 27*(2), 225-247.
- Lederer, M. (2015). Global governance. In K. Bäckstrand & E. Lövbrand (Eds.), *Research handbook on climate governance* (pp. 3–13). Cheltenham, England: Edward Elgar.
- Lee, E.S. (1966). A Theory of Migration, *Demography, 3*(1): 47-57
- Lemberg-Pedersen, M. (2019). Manufacturing displacement. Externalization and postcoloniality in European migration control. *Global affairs, 5*(3), 247-271.
- Lentz, C. (2006). *Ethnicity and the making of history in Northern Ghana*. Edinburgh University Press.
- Lentz, C. (2013). ‘Land, Mobility, and Belonging in West Africa.
- Lindgaard, L. S., Jarawura, F. X., & Kleist, N. (2024). Climate migration management? Contrasting international policy approaches with evidence from Ghana. *Climate Policy, 1-16*.
- Lobell, D. B., Bänziger, M., Magorokosho, C., & Vivek, B. (2011). Nonlinear heat effects on African maize as evidenced by historical yield trials. *Nature climate change, 1*(1), 42-45.
- Loss, A., Couto, R. D. R., Brunetto, G., Veiga, M. D., Toselli, M., & Baldi, E. (2019). Animal manure as fertilizer: changes in soil attributes, productivity and food composition. *Int. J. Res. Granthaalayah, 7*(9), 307.
- Ludi, E. (2009). Climate change, water and food security - ODI Background Note. London.
- Luginaah, T. Weis, S. Galaa, M. K. Nkrumah, R. Benzer-Kerr and R. Bagah (2009). “Environment, Migration, and Food Security in the Upper West Region of Ghana” in I.

- N. Luginaah and E. K. Yanful (eds.), *Environment and Health in Sub-Saharan Africa: Managing an Emerging Crisis* (London: Springer), 25–38.
- Mabe, F. N., Sarpong D. B., Osei-Asare Y. (2012). Adaptive capacities of farmers to climate change adaptation strategies and their effects on rice production in the Northern Region of Ghana.
- Mabogunje, A. (1970). Systems Approach to a Theory of Rural-Urban Migration, *Geographical Analysis*, 2(1): 1-18.
- Magnan, A. K., Schipper E. L. F, Burkett M, Bharwani S, Burton I, Eriksen S, Gemenne F, Schaar J and Ziervogel G (2016). Addressing the risk of maladaptation to climate change *WIREs Climate Change* 7 646–65.
- Manandhar, S., Pratoomchai, W., Ono, K., Kazama, S., & Komori, D. (2015). Local people's perceptions of climate change and related hazards in mountainous areas of northern Thailand. *International Journal of Disaster Risk Reduction*, 11, 47–59.
- Maponya, P., Mpandeli, S., (2013). The role of extension services in climate change adaptation in Limpopo province, South Africa. *J. Agric. Ext. Rural Dev.* 5 (7) 137–142.
- Marfo, S., Musah, H., & Abukari, A. (2019). Chieftaincy conflicts and food and livestock production challenges: an examination of the situation in Bimbilla, Ghana. *ADRRRI Journal of Arts and Social Sciences*, 16(7), 11-34.
- Martin, S. (2010). *Global Governance*, *International Migration* 3(16) p. 397-414. Available at: <https://www.jstor.org/stable/29764954>
- Martin, S. F. (2017). Environmental change and human mobility: trends, law and policy. *Comparative Population Studies-Zeitschrift für Bevölkerungswissenschaft*, 42, 187-217.
- Martiniello, M. and Rath, J. (Eds.) (2012). *An Introduction to International Migration Studies*. Amsterdam: Amsterdam University Press
- Mason, J. (2002). *Qualitative researching* (2nd e d.). London: Sage.
- Massey, D. S. (2019). The perils of seeing twenty-first century migration through a twentieth-century lens. *International Social Science Journal*, 68(227–228), 101–104.
- Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. E. (1998). *Worlds in Motion. Understanding International Migration at the End of the Millennium*. Oxford: Clarendon Press.
- Massey, D.S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A. and Taylor, J.E. (1993). Theories of International Migration: A Review and Appraisal. *Population and Development Review*, 19(3): 431-466.

- Mataga, J. (2019). Unsettled spirits, performance and aesthetics of power: The public life of liberation heritage in Zimbabwe. *International Journal of Heritage Studies*, 25(3), 277-297.
- McAdams, J. (2011). Environmental Migration Governance. In *Global Migration Governance*. Oxford University Press. (Original work published 2009).
- McCarthy, R. J. (2022). Family sociology as a theoretical enterprise? A personal reflection. *Families, Relationships and Societies*, 11(2), 303-319.
- McLeman, R. and Smit, B. (2006). Migration as an adaptation to climate change. *Climatic Change*, 76, pp. 31–53.
- McLeman, R. (2019). International migration and climate adaptation in an era of hardening borders. *Nat Clim Chage* 9(12):911–918. <https://doi.org/10.1038/s41558-019-0634-2>.
- McLeman, R., Wrathall, D., Gilmore, E., Thornton, P., Adams, H., & Gemenne, F. (2021). Conceptual framing to link climate risk assessments and climate-migration scholarship. *Climatic Change*, 165, 1-7.
- McSweeney, R. (2020). Carbon Brief Explainer: Nine Tipping Points that could be triggered by climate change
- Meeto, D. and Temple, B. (2003) "Issues in multi-method research: constructing self-care" *International Journal of Qualitative Methods*, 2(3): 1-21.
- MELR – Ministry of Employment and Labour Relations (2020). National Labour Migration Policy 2020–2024. Accra: Government of Ghana.
- Mendelsohn, R., Dinar, A., & Williams, L. (2006). The distributional impact of climate change on rich and poor countries. *Environment and Development Economics*, 11(02), 159–178.
- Mensah, A. A., Amponsah, O., Takyi, S. A., & Mensah, H. (2022). Land governance in Ghana and its implications for inclusive city development. *SN Social Sciences*, 2(1), 5.
- MESTI. (2013). Ghana National Climate Change Policy.
- Meze-Hausken, E. (2000). Migration caused by climate change: how vulnerable are people in dryland areas? *Mitigation and Adaptation Strategies for Global Change*, 5, 379-406.
- Milan, A., Schraven, B., Warner, K., & Cascone, N. (Eds.). (2016). *Migration, risk management and climate change: evidence and policy responses*. Springer International Publishing.
- Minia, Z. (2004). Climate Scenarios Developed for Climate Change Impacts Assessment Ghana (Accra: EPA).
- Ministry of Food and Agriculture (2014). Government of Ghana. [www.mofa.gov.gh](http://www.mofa.gov.gh) page.

- Ministry of Food and Agriculture – MOFA (2017). Agricultural Sector Progress Report. Ministry of Food and Agriculture. Republic of Ghana
- Ministry of Food and Agriculture -MOFA (2022). <https://mofa.gov.gh/site/programmes/pfj>
- Ministry of the Interior. (2017). Migration Unit (MU). Accra: Author. Retrieved from <https://www.mint.gov.gh/directorates/migration-unit-mu/>
- Mmbando, F. E., and Baiyegunhi L. J. S. (2016). “Socio-Economic and Institutional Factors Influencing Adoption of Improved Maize Varieties in Hai District, Tanzania.” *Journal of Human Ecology* 53 (1): 49–56.
- Mohammad, R. (2001). "Insiders and/or outsiders: positionality, theory and practice". In Limb, M. and Dwyer, C (eds.) *Qualitative Methods for Geographers: Issues and Debates* (London: Arnold) pp 101-117.
- Moore, D., Z. Niazi, R. Rouse, and B. Kramer. (2019). Building Resilience through Financial Inclusion: A Review of Existing Evidence and Knowledge Gap. Innovation for Poverty Action. <https://www.poverty-action.org/sites/default/files/publications/Building->
- Morgan, J., & Waskow, D. (2014). A new look at climate equity in the UNFCCC. *Climate Policy*, 14(1), 17-22.
- Moser, C. (1996) ‘Confronting crisis: a comparative study of household responses to poverty and vulnerability in four poor urban communities’ (Environmentally Sustainable Development Studies and Monograph Series No. 8), Washington, DC, World Bank.
- Muhammad, A. (2015). "Governance and Good Governance: A Conceptual Perspective." *The Dialogue*, vol. 10, no. 1
- Mukunda, (2012). *The Structuration approach of Anthony Giddens. Himalayan Journal of Sociology & Antropology*-Vol. V (2012
- Mulwa, C., P. Marenja, D. B. Rahut, and M. Kassie. (2017). “Response to Climate Risks Among Smallholder Farmers in Malawi: A Multivariate Probit Assessment of the Role of Information, Household Demographics, and Farm Characteristics.” *Climate Risk Management* 16:208 221.
- Musah-Surugu, I. J., Ahenkan, A., Bawole, J. N., & Darkwah, S. A. (2018). Migrants’ remittances: A complementary source of financing adaptation to climate change at the local level in Ghana. *International Journal of Climate Change Strategies and Management*, 10(1), 178-196.
- Nansen Initiative (2015) ‘Agenda for the protection of cross-border displaced persons in the context of disasters and climate change volume 1’. Geneva: The Nansen Initiative.

- Nash, S. L. (2017): From Cancun to Paris: an era of policymaking on climate change and migration. In: *Global Policy* 9 (1). 53–63.
- Nash, S. L. (2018). From Cancun to Paris: An era of policy making on climate change and migration. *Global Policy*, 9(1), 53-63.
- National Geographic Society (2005). *Human Migration Guide*. Pp 6-8.
- Niang, I., Ruppel, O. C., Abdrabo, M. A., Essel, A., Lennard, C. Padgham, J., & Ur P. (2014). Africa In: V.R. Barros, C. B. Field, D. J. Dokken, M. D. Mastrandrea, K.J. Mach, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S.Kissel, A. N. Levy, S. MacCracken, P. R. Mastrandrea & L.White (Eds.), *Climate Change 2014: Impacts, adaptation, and vulnerability. Part B: Regional aspects. Contribution of working group II to the fifth assessment report of the Intergovernmental Panel on Climate Change* (pp. 1199–1265). Cam-bridge University Press, Cambridge.
- Nkegbe, P. K., Abu, B. M., & Issahaku, H. (2017). Food security in the Savannah Accelerated Development Authority Zone of Ghana: an ordered probit with household hunger scale approach. *Agriculture & Food Security*, 6(1), 1-11.
- Nuhu J., A., & Wale, E. (2023). How does participation in Ghana’s fertilizer subsidy program (GFSP) affect the adoption of sustainable intensification practices (SIPs) and gross farm inputs? *Development Studies Research*, 10(1), 2180047.
- O’Brien, K. L., Leichenko, R. M., Kelkar, U., Venema, H., Aandahl, G., Tompkins, H. ... West, J. (2004). Mapping vulnerability to multiple stressors: Climate change and globalization in India. *Global Environmental Change*, 14, 303–313.
- O’Reilly, K. (2016). Migration theories—A critical overview. In A. Triandafyllidou (Ed.), *Routledge Handbook of Immigration and Refugee Studies*, (1st ed., p. 27–28). Routledge.
- Okrah, K. (2017). The dynamics of gender roles and cultural determinants of African women’s desire to participate in modern politics. *Global Engagement and Transformation* 1(2): 1–15.
- Olivier de Sardan, J. -P. (2007). Analyse Retrospective of the Food Crisis in Niger. Working document 45, *Department of Research*, Agence Française de Development (p. 50).
- Onwutuebe, J. C. (2019). Patriarchy and women vulnerability to adverse climate change in Nigeria. *Sage open*, January –March 2019: 1-7.
- Opio, A., Muyonga, M., & Mulumba, N. (2013). HIV infection in fishing communities of Lake Victoria Basin of Uganda--a cross-sectional sero-behavioural survey. *PloS one*, 8(8), e70770. doi:10.1371/journal.pone.0070770.

- Oppong, C. (2006). “Familial roles and social transformations of older men and women in sub-Saharan Africa”. *Research on Aging*, vol. 28, No6. Available on <http://onlinesagepub.com>
- Oteng-Ababio, M., Yokomatsu M., Dzivenu, T., Samaddar, S. & Akudugu J. A. (2016). Can local adaptation and mitigation strategies cooperate and synergize one another? Lessons from Wa West District, Ghana. *Environmental Management* (in press).
- Owusu-Sekyere, E., Bibariwiah, C., Owusu, V., & Donkor, E. (2021). Farming under irrigation management transfer scheme and its impact on yield and net returns in Ghana. *Land Use Policy*, 102, 105266.
- Owusu, K., and Waylen P. (2009). ‘Trends in spatiotemporal variability in annual rainfall in Ghana (1951–2000)’. *Weather*, 64(5): 115-120.
- Pauw, K. (2022). A review of Ghana’s planting for food and jobs program: Implementation, impacts, benefits, and costs. *Food Security*, 14(5), 1321-1335.
- Peach, C. (2002). Social geography: new religion and ethnoburbs—contrast with cultural geography. *Progress in Human Geography*, 26(2), 252–260.
- Persson, A. (2019). Global adaptation governance: an emerging but contested domain. *Wiley Interdiscip. Rev. Clim. Chang.* 10, 1–18. <https://doi.org/10.1002/wcc.618>.
- Persson, A. Dzebo, A., (2019). Special issue: exploring global and transnational governance of climate change adaptation. *Int. Environ. Agreements Polit. Law Econ.* 19, 357–367. <https://doi.org/10.1007/s10784-019-09440-z>.
- Peters, K., & Viveknanda, J. (2014). *Topic guide: conflict, climate and environment London: Evidence on Demand*.
- Pickbourn, L. J. (2016) 'Remittances and household expenditure on education in Ghana's northern region: why gender matters', *Feminist Economics*, 22(3): 74–100.
- Piguet, E. (2013). From “primitive migration” to “climate refugees”. The curious fate of the natural environment in migration studies. *Annals of the Association of American Geographers*. 103(1), 148-162.
- Piguet, E., Kaenzig R., Guélat J (2018). The uneven geography of research on “environmental migration.” *Popul Environ* 39(4):357–383. <https://doi.org/10.1007/s11111-018-0296-4>
- Policarpo, V. (2015). What is a friend? An exploratory typology of the meanings of friendship. *Social Sciences*, 4(1), 171-191.
- Przeworski, A., Stokes, S. C. S., Stokes, S. C., & Manin, B. (Eds.). (1999). *Democracy, Accountability, and Representation* (Vol. 2). Cambridge University Press

- Quick, D.L. and Nelson, J.C. (1997), *Organisational Behavior: Foundations, Realities, and Challenges*, (New York: West Publishing Company), pp. 83-84.
- Quisumbing, A.R. and Pandolfelli, L. (2010). Promising approaches to address the needs of poor female farmers: resources, constraints, and interventions. *World Development*, 38, pp. 581–592.
- Rademacher-schulz, C., Schraven, B., & Mahama, E. S. (2014). Time matters: Shifting seasonal migration in Northern Ghana in response to rainfall variability and food insecurity. *Climate and Development*, 6(1), 46–52.
- Radhouane, L. (2013). Climate change impacts on North African countries and on some Tunisian economic sectors. *Journal of Agriculture and Environment for International Development*, 107(1), 101–113.
- Rajan, M., Shahena, S., Chandran, V., & Mathew, L. (2021). Controlled release of fertilizers concept, reality, and mechanism. In *Controlled release fertilizers for sustainable agriculture* (pp. 41-56). Academic Press.
- Rao, V. S. P. and Narayana, P. S. (1998). *Organisation Theory and Behaviour*, (Delhi: Konark Publishing Company), (329-330).
- Ravenstein, E. G. (1885). The laws of migration. *Journal of the Royal Statistical Society*, 48(2), 167–227.
- Republic of Ghana (2000a). Immigration Act, 2000 (Act 573). Accra: Republic of Ghana. Available at: [http://www.ghanaiandiaspora.com/wp/wpcontent/uploads/2014/02/Ghana-Immigration\\_act\\_-2000-ACT-573.pdf](http://www.ghanaiandiaspora.com/wp/wpcontent/uploads/2014/02/Ghana-Immigration_act_-2000-ACT-573.pdf).
- Ribot, J., Faye, P., & Turner, M. D. (2020). Climate of anxiety in the Sahel: emigration in xenophobic times. *Public Culture*, 32(1), 45-75.
- Richmond, J. W. (2019). Seas of Change: A Case Study of Old Fadama and Understanding Informal Community Climate Change Resilience. *Research for the Sociology of Education*. New York: Greenwood, pp.241–258. Review, 23(3): 457-485.
- Rigaud, K. K., de Sherbinin, A., Jones, B., Bergmann, J., Clement, V., Ober, K., Schewe, J., Adamo, S., McCusker, B., Heuser, S., & Midgley, A. (2018). *Groundswell: Preparing for Internal Climate Migration*. Washington, DC: The World Bank.
- Rignall, K. (2016). The labor of agrodiversity in a Moroccan oasis. *The Journal of Peasant Studies*, 43(3), 711-730.
- Rosa, L. (2022). Adapting agriculture to climate change via sustainable irrigation: Biophysical potentials and feedbacks. *Environmental Research Letters*, 17(6), 063008.

- Sabogu, A., Nassè, T. B., & Osumanu, I. K. (2020). Land conflicts and food security in Africa: An evidence from Dorimon in Ghana. *International Journal of Management & Entrepreneurship Research*, 2(2), 74-96.
- Sakdapolrak, P., Naruchaikusol, S., Ober, K., Peth, S., Porst, L., Rockenbach, T., & Tolo, V. (2016). Migration in a changing climate. Towards a translocal social resilience approach. *DIE ERDE – Journal of the Geographical Society of Berlin*, 147(2), 81–94
- Sam, A. S., Padmaja, S. S., Kächele, H., Kumar, R., & Müller, K. (2020). Climate change, drought and rural communities: Understanding people's perceptions and adaptations in rural eastern India. *International Journal of Disaster Risk Reduction*, 44, 101436.
- Savannah Accelerated Development Authority SADA (2016). Resources and master plan for the transformation of agriculture in the sada zone. Tamale: SADA.
- Schewel, K. (2020). Understanding immobility: Moving beyond the mobility bias in migration studies. *International migration review*, 54(2), 328-355.
- Schraven, B., Adaawen, S., Rademacher-Schulz, C., & Segadlo, N. (2019). *Human mobility in the context of climate change in West, East and Southern Africa* (internal report). Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).
- Schroth, G., Läderach, P., Martinez-Valle, A. I., Bunn, C., & Jassogne, L. (2016). Vulnerability to climate change of cocoa in West Africa: Patterns, opportunities and limits to adaptation. *Science of the Total Environment*, 556, 231-241.
- Scott, J. (1985). *Weapons of the weak: Everyday forms of peasant resistance*. New Haven: Yale University Press.
- Segadlo, N., Krause, U., Zanker, F., & Edler, H. (2021). Effects of the COVID-19 pandemic on refugees and their protection in Kenya, Uganda, Ghana, Nigeria, South Africa and Zimbabwe.
- Shahena, S., Rajan, M., Chandran, V., & Mathew, L. (2021). Conventional methods of fertilizer release. In *Controlled release fertilizers for sustainable agriculture* (pp. 1-24). Academic Press.
- Shekhtman, L. (2019). Martian Dust Could Help Explain Water Loss, Plus Other Learnings From Global Storm. *Nasa. Gov*.
- Shenelle, L., Paramu M. & Romano L. (2021). Drought and its impacts on small-scale farmers in sub-Saharan Africa: a review, *South African Geographical Journal*, 103:3, 319-341, DOI: 10.1080/03736245.2020.1795914.
- Sibeon, R. (2004) *Rethinking Social Theory* (London: Sage Publications).

- Sikha, K., Paul B. & Brendan M. (2020). The experiences and perceptions of farmers about the impacts of climate change and variability on crop production: a review, *Climate and Development*, 12:1, 80-95, DOI: 10.1080/17565529.2019.1603096
- Simelton, E., Quinn, C. H., Batisani, N., Dougill, A. J., Dyer, J. C., Fraser, E. D. G., ... Stringer, L. C. (2013). Is rainfall really changing? Farmers', perceptions, meteorological data, and policy implications. *Climate and Development*, 5(2), 123– 138.
- Small, L. A. (2007). The sustainable rural livelihoods approach: a critical review. *Canadian Journal of Development Studies/Revue canadienne d'études du développement*, 28(1), 27-38.
- Songsore, J. and Denkabe, A. (1995). *Challenging rural poverty in Northern Ghana: the case of the Upper West Region*. Trondheim: The University of Trondheim, Centre for Environment and Development, SMU.11
- Stanturf, J. A., Warren, M. L., Charnley, S., Polasky, S. C., Goodrick, S. L., Armah, F., & Nyako, Y. A. (2011). Ghana climate change vulnerability and adaptation assessment. *Washington: United States agency for international development*.
- Stark, O. and Bloom, D.E. (1985). The New Economics of Labour Migration, *American Economic Review*, 75(2): 173-178.
- Stern, N., (2007). *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press).
- Stokke, K. & Törnquist, O. (2016). Transformative Democratic Politics, in Stokke, K., Törnquist, O. (Eds.) *Democratization in the Global South: The Importance Transformative Politics* Palgrave Macmillan.
- Stringer, L. C., Dyer, J. C., Reed, M. S., Dougill, A. J., Twyman, C., & Mkwambisi, D. (2009). Adaptations to climate change, drought and desertification: local insights to enhance policy in southern Africa. *Environmental science & policy*, 12(7), 748-765.
- Subedi, D. (2016). Explanatory sequential mixed method design as the third research community of knowledge claim. *American Journal of Educational Research*, 4(7), 570-577.
- Suhrke, A. (1993). Environmental degradation and population flows. *Journal of International Affairs*, 47, pp. 473–496.
- Sward, J. and Codjoe, S. (2012) Human Mobility and Climate Change Adaptation Policy: A Review of Migration in National Adaptation Programmes of Action (Napas)' *Migrating Out of Poverty Research Programme Consortium Working Paper 6*.

- Szabo, S., Ahmed, S., Wiśniowski, A., Pramanik, M., Islam, R., Zaman, F., & Kuwornu, J. K. (2022). Remittances and food security in Bangladesh: an empirical country-level analysis. *Public Health Nutrition*, 25(10), 2886-2896.
- Szaboova, L. (2023). *Climate change, migration and rural adaptation in the Near East and North Africa region*. Rome, FAO.
- Tanle, A. (2010). Livelihood status of migrants from the northern savannah zone resident in the Obuasi and Techiman Municipalities. *A Ph.D. Thesis submitted to the Department of Population and Health, University of Cape Coast, Cape Coast, Ghana*.
- Tanle, A., & Kumi-Kyereme, A. (2014). Out-migration and development in northern Ghana: Some empirical and anecdotal evidence.
- Tapsoba, A. T., Motel, P. C., & Combes, J. L. (2019). Remittances, food security and climate variability: The case of Burkina Faso.
- Tarhule, A., & Lamb, P. J., (2003). Climate research and seasonal forecasting for West Africans: perceptions, dissemination, and use? *Bulletin of American Meteorological Society*, 84, pp. 1741–1759.
- Taylor, J. E. (1999). The New Economics of Labour Migration and the Role of Remittances in the Migration Process, *International Migration*, 37(1): 63-88.
- Taylor, J.E., Zhu, H., Gupta, A., Filipski, M., Valli, J. and Gonzalez, E. (2016) *Economic impact of refugee settlements in Uganda*
- Taylor, M. (2012) ‘Strengthening the voice of the poor: religious organisations’ engagement in policy consultation processes in Nigeria and Tanzania’, *Development in Practice* 22(5): 792–802.
- Teshome, M. (2016). Rural households’ agricultural land vulnerability to climate change in Dembia woreda, Northwest Ethiopia. *Environmental Systems Research*, 5(14), 1– 18.
- Tetteh, B. K., Donkoh, S. A., & Ansah, I. G. (2023). Climate change coping and adaptation and its effect on livestock herd size and farmers’ welfare in the Upper West Region of Ghana. *Environment, Development and Sustainability*, 1-23.
- Teye, J. K. (2012). Benefits, challenges, and dynamism of positionalities associated with mixed methods research in developing countries: Evidence from Ghana. *Journal of Mixed Methods Research*, 6(4), 379-391.
- Teye, J. K. (2013). Forest resource governance in Africa: *Proposition for a policy network model*. *Journal of Forest Policy and Economics* 26: 63–70.

- Teye, J. K., & Owusu, K. (2015). Dealing with climate change in the coastal Savannah Zone of Ghana: in situ adaptation strategies and migration. In *Environmental Change, Adaptation and Migration: Bringing in the Region* (pp. 223-244). London: Palgrave Macmillan UK.
- Teye, J. K., Alhassan, O., & Setrana, M (2017). Evolution and nature of diaspora engagement policies in Ghana. In J. Mangala (Ed), *Africa and its Global Diaspora: The Policy and Politics of Emigration*. New York: Palgrave MacMillan (pp. 143-174).
- Teye, J.K. and Torvikey, D. (2018). *The political economy of agricultural commercialisation in Ghana*. APRA Working Paper 15. IDS.
- Teye, J., Gravesen, M., Jarawura, F., Kleist, N., Lindegaard L. S. (2020). Governance, climate change and mobility in Ghana, DIIS Working Paper, No. 2020:06, ISBN 978-87-7236-018-8, Danish Institute for International Studies (DIIS), Copenhagen.
- Teye, J., Gravesen, M., Jarawura, F., Kleist, N., Lindegaard L. S. (2021). Governance, climate change and mobility in Ghana, DIIS Working Paper, No. 2021:06, ISBN 978-87-7236-018-8, Danish Institute for International Studies (DIIS), Copenhagen
- Teye, J. K. (2022). Migration and Development. *Routledge Handbook of Immigration and Refugee Studies*.
- Teye, J., Vargas-Silva, C., & Godin, M. (2022). Migration-relevant policies in Ghana. *Changes*, 1, 24.
- Teye, J. K., & Nikoi, E. G. (2022). Climate-induced migration in West Africa. In *Migration in West Africa: IMISCOE Regional Reader* (pp. 79-105). Cham: Springer International Publishing.
- Teye, J. K., Darkwah, A. K., Thorsen, D., Abutima, T. K., & Boateng, D. A. (2023). Negotiating Gender Roles and Power Relations through the Management of International Migrant Remittances in a Patriarchal Community in Ghana. *Journal of Asian and African Studies*, 00219096231160695.
- Thiede, B. C., & Gray, C. L. (2017). Heterogeneous climate effects on human migration in Indonesia. *Population and Environment*, 39, 147-172.
- Tia, J., Kuunibe, N., & Nkegbe, P. K. (2023). Drivers of financial inclusion in Ghana: Evidence from microentrepreneurs in the Wa Municipality of the Upper West Region. *Cogent Economics & Finance*, 11(2), 2267854.
- Tol, R. S. (2018). The economic impacts of climate change. *Review of environmental economics and policy*.
- Tompkins, E. L., & Eakin, H. (2012). Managing private and public adaptation to climate change. *Global Environmental Change*, 22(1), 3–11.

- Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19, 349–357.
- Tripathi, A., & Mishra, A. K. (2017). Knowledge and passive adaptation to climate change: An example from Indian farmers. *Climate Risk Management*, 16, 195-207.
- Tschakert, P. (2007). Views from the vulnerable: Understanding climatic and other stressors in the Sahel. *Global Environmental Change*, 17(3–4), 381–396.
- Turner, N. C. (2019). Imposing and maintaining soil water deficits in drought studies in pots. *Plant and Soil*, 439, 45-55.
- UN DESA (2016). Trends in International Migration Stock; Migrants by Destination and Origin, the 2015 Revision, Population Division, United Nations Department of Economic and Social Affairs
- UNCCD (2015). Ghana National Drought Plan, vol. 1, 2015, pp. 1–91.
- United Nations Department of Economic and Social Affairs, Population Division (2019). *Living arrangements of older persons around the world. Population Facts*, No. 2019/2.
- UNESCO (2012). *Managing Water under Uncertainty and Risk* (Vol. 1). Paris: United Nations Educational, Scientific and Cultural Organization.
- UNFCCC, (2011). The Cancun agreements: *Outcome of the work of the ad hoc working group on long-term cooperative action under the convention*. Bonn, Germany.
- UNFCCC, (2014). *Report of the Conference of the Parties on its Nineteenth Session, Warsaw, 11–23 November 2013, Addendum, FCCC/CP/2013/10/Add.1*.
- United Nations, Department of Economic and Social Affairs, Population Division (2019). *International Migration 2019: Report (ST/ESA/SER.A/438)*.
- Van der Geest, K. (2011). North-South Migration in Ghana: What Role for the Environment *International Migration*, 49(sI), e69-e94. Vulnerability and Adaptive Capacity in Northern Ghana
- Van Leeuwen, J. P., Creamer, R. E., Cluzeau, D., Debeljak, M., Gatti, F., Henriksen, C. B., & Rutgers, M. (2019). Modeling of soil functions for assessing soil quality: Soil biodiversity and habitat provisioning. *Frontiers in Environmental Science*, 7, 113.
- Verme, Paolo; Schuettler, Kirsten (2020). The Impact of Forced Displacement on Host Communities. A Review of the Empirical Literature in Economics, GLO Discussion Paper, No. 583, Global Labor Organization (GLO), Essen.

- Vinke, K., Rottmann, S., Gornott, C., Zabre, P., Nayna Schwerdtle, P., & Sauerborn, R. (2022). Is migration an effective adaptation to climate-related agricultural distress in sub-Saharan Africa? *Population and Environment*, 1-27.
- Vinke, K. (2019). *Unsettling Settlements-Cities, Migrants, Climate Change. Rural-Urban Climate Migration as Effective Adaptation? Studies on International Environmental Policy*. Lit Verlag, Munster.
- Vinke, K., Bergmann, J., Blocher, J., Updadyay, H., & Hofmann, R. (2020). *Migration as adaptation? Migration Studies*, Oxford Academic.
- Waddington, C. (2003). *Livelihood Outcomes of Migration for Poor People. (Working Paper T1, Development Research Centre on Migration, Globalisation and Poverty)*. UK: University of Sussex
- Waldinger, M., & Fankhauser, S. (2015). *Climate change and migration in developing countries: evidence and implications for PRISE countries*.
- Warner, K., Ehrhart C., de Sherbinin A., Adamo S., Chai-Onn T. (2009). *In search of shelter: mapping the effects of climate change on human migration and displacement*.
- Warner, K. (2010). *Global environmental change and migration: Governance challenge. Global Environmental Change* 20 (2010): 402–413.
- Warner, K., Afifi T., Kalin W., Leckie S., Ferris B., Martin S.F and Wrathall D. (2013). 'Changing Climate and Moving People: Framing Migration, Displacement and Planned Relocation'. Policy Brief No 8. Bonn: United Nations University Institute for Environmental and Human Security (UNU-EHS).
- Warner, K., & Aff, T. (2014). *Where the rain falls: evidence from 8 countries on how vulnerable households use migration to manage the risk of rainfall variability and food insecurity. Climate and Development*, 6(1), 1–17.
- Weiss, T. G., & Wilkinson, R. (2014). *Rethinking global governance? Complexity, authority, power, change. International Studies Quarterly*, 58(1), 207–215.
- Weitz, N., & Persson, A. (2016). *Mapping the global governance of climate change adaptation. Paper presented at the Earth System Governance Conference, Nairobi, December 8–10, 2016*.
- Wiegel, H., Boas, I., & Warner, J. (2019). *A mobilities perspective on migration in the context of environmental change. Wiley Interdisciplinary Reviews: Climate Change*, 10(6), e610.
- Wild, S. (2015b). *FACTSHEET: Why Africa is vulnerable to climate change*.

- Wilkinson, E., Kirbyshire M., Mayhew L., Batra P., Milan A. (2016). Climate-induced migration and displacement: closing the policy gap. Briefing, Overseas Development Institute (ODI), London, p. 12.
- Winchester, H. P. M. (2005). "Qualitative research and its place in human geography". In Hay, I. (e.d.) *Qualitative Research Methods in Human Geography*, Second edition (Oxford, New York: Oxford University Press) pp 3- 18.
- World Bank (2006). Bridging the North-South Divide in Ghana: Draft Summary, World Development Report 2006, Background Papers.
- World Bank (2015a), Rainqaz\fed agriculture. <http://water.worldbank.org/topics/agricultural->
- World Bank, (2019). 2019 Annual remittances data. Data set. Washington, D.C. Available at [www.worldbank.org/en/topic/migrationremittancesdiasporaissues/brief/migration-](http://www.worldbank.org/en/topic/migrationremittancesdiasporaissues/brief/migration-)
- Yageta, Y., Osbahr, H., Morimoto, Y., & Clark, J. (2022). Farmers' mental models of soil fertility in a semi-arid area of Kenya. *Soil Security*, 7, 100065.
- Yakubu, R. N., Birkmann, J., & Raumer, H. S. (2019). The role of international NGOs in climate change adaptation in the agricultural sector in the northern region of Ghana. *Int. J. Dev. Sustainability*, 8(3), 249-263.
- Yakubu, R. N. (2018). The role of local government in the adaptation and mitigation of climate change in the agricultural sector in the Northern region of Ghana. *Journal of Agriculture and Environmental Sciences*, 7(2), 101-108.
- Yaro, J. A. (2013). The perception of and adaptation to climate variability/change in Ghana by small-scale and commercial farmers. *Regional Environmental Change*, 13(6), 1259–1272.
- Yaro, J. K. Teye and S. Bawakyillenuo (2015) “Local Institutions and Adaptive Capacity to Climate Change/variability in the Northern Savannah of Ghana”, *Climate and Development*.
- Yeboah, I. (27 April 2017). One year after launch, National Migration Policy not implemented – ACILA Graphic Online. Retrieved from <https://www.graphic.com.gh/news/general-news/one-year-after-launch-national-migration-policy-not-implemented-acila.html>
- Zaami M (2020) Gendered strategies among northern migrants in Ghana: the role of social networks. *Ghana Journal of Geography* 12(2): 1–24.
- Zander, K. K., Garnett, S. T., Sterly, H., Ayebe-Karlsson, S., Šedová, B., Lotze-Campen, H ... & Baggen, H. S. (2022). Topic modelling exposes disciplinary divergence in research on the nexus between human mobility and the environment. *Humanities and Social Sciences Communications*, 9(1).

Zickgraf, C. (2018). Immobility. In R. McLeman & F. Gemenne (Eds.), *Routledge handbook of environmental displacement and migration* (pp. 71–84). London, England and New York, NY: Routledge.

Zickgraf, C. (2019). Keeping People in Place: Political Factors of (Im) mobility and Climate Change. *Social Sciences*, 8(8), 228.

Zickgraf, C. (2021). Climate change, slow onset events and human mobility: reviewing the evidence. *Current Opinion in Environmental Sustainability*, 50, 21–30.



**APPENDICES**

**APPENDIX A**

**GCM SURVEY, 2020-21**

**Introduction**

This survey is being conducted as part of a study into the ways that environmental change affects how households manage their mobility practices and whether national policies local institutions (chiefs, elders, local government, local religious leaders, and others) might play in this. Your responses will be used anonymously and only for academic research purposes.

*Instruction: The male and female 'heads of household' – or closest to - interviewed separately.*

*Circle codes or answers in spaces provided.*

**A Background Characteristics and Assets**

1. Settlement Name: ..... Settlement Code: .....
2. Respondent Code: .....
3. Gender of respondent (i) Male (ii) Female
4. Age of respondent: .....
5. Relation of respondent to household head: (i) Household head (ii) Spouse (iii) Son/daughter (iv) Brother or Sister to household head (v) other (specify .....
6. How many years have you been living in this community? (i) All my life (ii) 20 years or more (iii) 10 to 19 years (iv) less than 10 years
7. Number of household members (i) Currently resident (eating together) ..... (ii) Currently non-resident (would eat together if present) .....
8. Education completed by the respondent: (i) No formal education (ii) Primary (iii) Junior Middle School (class 8-10) (iv) Senior High School (Class 11-12)/'A'level (v) Vocational (vi) Tertiary
9. Main source of livelihood: (i) Crop farming (ii) Animal husbandry (iii) Fishing (iv) Land rents (v) Trading/commerce (vi) Civil servant (vii) Business employment (viii) Skilled labour (mason, carpenter, mechanis..) (ix) unskilled labour (x) Remittances (xi) Other (specify).....
10. Additional sources of livelihoods: (i) Crop farming (ii) Animal husbandry (iii) Fishing (iv) Land rents (v) Trading/commerce(vi) Civil servant (vii) Business employment (viii) Skilled labour (mason, carpenter, mechanics..) (ix) Unskilled labour (x) Remittances (xi) Other (specify).....
11. If you cultivate crops, indicate the types of crops you cultivate? (1) Rice (2) Maize (3) Millet (4) Sorghum (5) Groundnut (6) Soya bean (7) Cassava (8) Yam (9) Beans / Cowpea (10) Bambara beans

(11) Okra (12) Pepper (13) Water melon (14) Mangoes (15) Tomato (16) Salad Vegetables (17) Cotton

12. Do you farm land? Yes/No If yes: (i) On land you own (ii) Land owned by my spouse (iii) Contract (iv) On forest land (v) On sharecropped land (vi) on family land (v) on community land (vi) On land leased under fixed term.

13. Do you own a farming land in this community? (i) Yes (ii) No

14. If yes how many acres of land do you own .....

15. Major items owned by you (Tick as many as applicable):

ASSETS	OWNED	RENTED/LEASD
1. House		
2. Working livestock (e.g. mule, horse, oxen)		
3. Cows		
4. Tractor		
5. Plough		
6. Television		
7. Radio		
8. Bicycle		
9. Motorcycle/two-wheeler		
10. Car/jeep		
11. Refrigerator		
12. Backpack hand sprayer		
13. Tricycle with load carrier		

16. Do you have a bank account? Yes / No

17. Do you have a mobile phone account that permits making payments? Yes/No/NA

18. Do you borrow money from:

	Regularly	Occasionally	Never
Bank			
Local financial institution			
Private moneylender			
Family			
Friends			
Other, specify .....			

**B. Experiences of climate change and its impacts on livelihood**

19. Has the temperature in this area changed over the past 20 -30 years? 1. Increased 2. Decreased 3. Extreme fluctuations 4. No change 5. Don't know

20. Has the rainfall in this area changed over the past 20 -30 years? 1. Increased 2. Decreased 3. Extreme fluctuations 4. No change 5. Don't know

21. How would you describe the distribution of the rainfall during the farming season over the last 20 – 30 years? 1. Increased 2. Decreased 3. Extreme fluctuations 4. No change 5. Don't know

22. In your view, is the climate in this area changing? 1. Yes 2. No 3. Don't know

23. How would you describe drought occurrence in your area over the last 20 to 30 years? 1. Decreasing 2. Increasing 3. The same 4. Don't know 5. Other

24. How often does this area get flooded? 1. Every year 2. Every other year 3. Once in 5 years 4. Not common 5. Don't know

25. Based on your experience in this community, grade the hazards and challenges given below from 1 'not a problem' to 5 'A very serious problem'. Also, indicate whether or not the hazards have become more threatening in the last 10 years than the years before.

Hazard	Mark with X if experienced within the last 5 years	Rank	How do you see the hazard?			
			Increasing	Same	Decreasing	Don't know
Drought						
Floods						
Rains irregular, insufficient or too heavy						
Extreme temperatures (high and/or low)						
Crop pests/diseases (fx locusts, rodents, birds, fungi, etc)						
Decreasing soil fertility						
Problems with input purchase (seeds, fertilizers, raw materials, etc.)						
Problems with output sales (agricultural, artisan, fish, dairy, etc products)						
Livestock diseases						
Lack of drinking water						
Illness affecting the household/family						
High food prices						
Lack of employment						
Problems with access to farming land						
Problems with access to forestry and Non-Timber Forest Products (NTFP)						
Conflicts over land (land grabbing)						
Conflicts over service provision (schools, health clinics, drinking water, electricity, etc.)						
Lack of government support to help with HH's problems						

26. What are the main effects of changes in temperature on your economic activities/livelihoods? Rank the 5 topmost responses with 1 being the most serious effect and 5 being the least serious effect (i) Declining crop yield (ii) declining income (iii) increased food insecurity (iv) increased water scarcity (v) increased incidence of crop pests and diseases (vi) emergence/worsening of human diseases (vii) increased stress load (viii) increased for work load.

27. What are the main effects of changes in rainfall on your economic activities/livelihoods? Rank the 5 topmost responses with 1 being the most serious effect and 5 being the least serious effect? (i) Declining crop yield (ii) declining income (iii) increased food insecurity (iv) increased water scarcity (v) increased incidence of crop pests and diseases (vi) emergence/worsening of human diseases (vii) increased stress load (viii) increased for work load

28. What are the main effects of flooding on your economic activities/livelihoods? Rank the 5 topmost responses with 1 being the most serious effect and 5 being the least serious effect? (i) Declining crop yield (ii) declining income (iii) increased food insecurity (iv) increased water scarcity (v) increased incidence of crop pests and diseases (vi) emergence/worsening of human diseases (vii) increased stress load (viii) increased for work load.

**SECTION C: Migration as a coping or an adaptation strategy to deal with the negative impacts of climate change.**

HH migrant	Type of mobility: (i) Per manent abroad (5 years) (ii) Per manent in-country (5 years) (iii) Rec urrent/short-term (iv) Daily commute work/ school (v) Returned migration (vi) Other (state)	Age today	Gender (i) Male (ii) Female	Destination (i) Capital (ii) Another city Rural settlement (iii) Abroad (specify) ..... ...	Reasons for Migration (multiple allowed) (i) Education (ii) Marriage (iii) Employment opportunity (iv) Hustling/look for opportunities (v) Lack of farming land (vi) Failing production (vii) Lack of work here (viii) Floods (ix) Droughts (x) Conflict/insecurity (xi) Other (specify)	Has migrant regularly sent money/food home while away?  (i) Regularly (ii) Occasionally (iii) No
1						
2						
3						
4						

29. Has any household member moved seasonally temporarily or permanently away from this village in the last 10 years (since 2012)? (i) Yes (ii) No

30. What types of mobility, Age of migrants, Gender of migrants, Destinations of migrants, Reasons for migration and remittances received? (Refer to the table above)

31. If the household has received remittances in the past 12 months, what have they be used for?

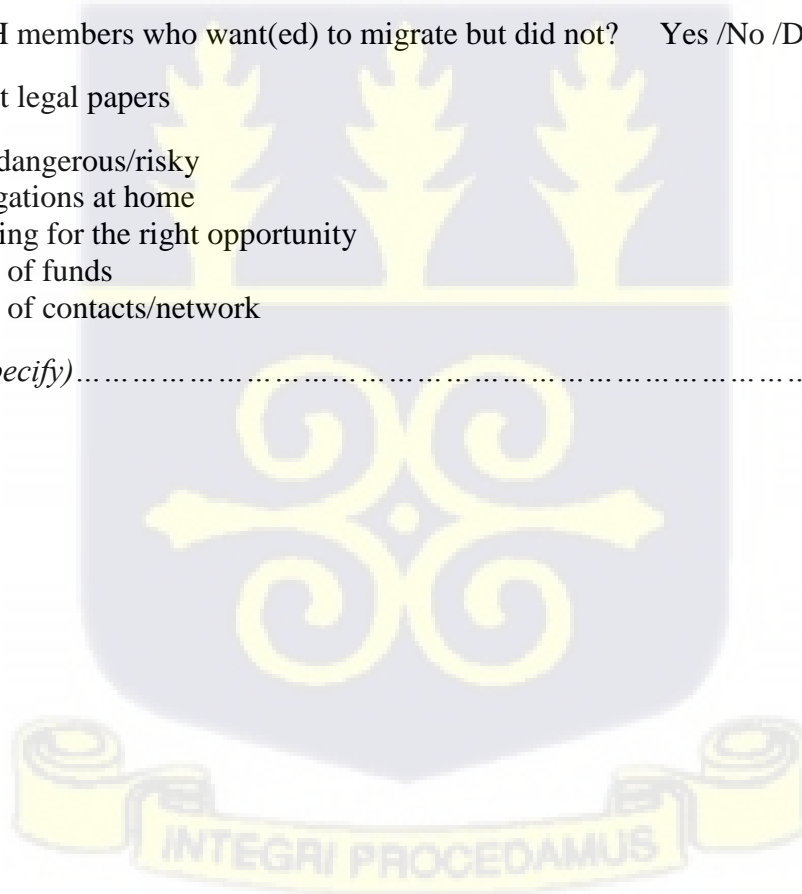
	Mainly	Partly	Not at all
Food			
Education (HH children)			
Healthcare			
Farming-seeds/insecticides/irrigation			
Farming – livestock			
House construction			
Other (specify)			

32. Are there HH members who want(ed) to migrate but did not? Yes /No /Do not know

33. Could not get legal papers

- (i) Too dangerous/risky
- (ii) Obligations at home
- (iii)Waiting for the right opportunity
- (iv)Lack of funds
- (v) Lack of contacts/network

Other (specify).....



**SECTION D: The role national policies and local institutions in shaping livelihoods and migration**

34. Has the household received help in the past specifically due to drought, flooding, poor/failed harvests, and lack of food? Yes / No / Do not know.

35. If Yes, where from and in what form:

Source of help	Form of help (i) Money (ii) Food (iii) Inputs (iv) Training (v) Other (specify)	Regularly	Occasionally	Never
Central or regional government				
Local government offices				
Local political leaders				
Traditional leaders				
Religious institutions (church/mosque, etc.)				
Family and friends				
Other (specify)				

36. Has anyone in your family come home to the household because of Covid-19?  
Yes/No/ Do not know

37. Has your household lost any of the following because of Covid-19?

	Yes	No	Not relevant
Loss of remittances			
Loss of farming income			
Loss of income from employment			
Loss of income from market sales			
Loss of income from handicrafts			
Loss of income from service work			

38. Where would you go for treatment and medicines for Covid-19?

.....

.....

## APPENDIX B

### IN-DEPTH INTERVIEW AND FOCUS GROUP DISCUSSIONS (MEN, WOMEN AND YOUTH MIXED GROUP) GUIDE

#### Governance, Climate change and Migration in the Upper West Region of Ghana

##### Introduction

Dear Sir/Madam,

Richard Seyram is my name, a Ph. D candidate from the University of Ghana, Centre for Migration Studies. I am conducting a study on Governance, Climate Change and Migration in your community as part of my course requirements in Migration Studies. This study aims to examine the relationship between governance, climate change and migration in Ghana. I would, therefore, like to have some discussions with you in relation to the above topic. Your involvement is considered very crucial for the success of this thesis. Please, be rest assured that the views that will be expressed here are only meant for academic purposes and will not be traced back to you. Please you have the liberty to discontinue with the interview at any time. Nonetheless, your opinions will be greatly appreciated.

##### **SECTION A: Background Information**

Could you tell me about yourself? Probe for background information (age, education, marital status, religious affiliation, language, occupation/profession, rank etc.)

##### **SECTION B: Experiences of climate change and its impacts on livelihoods of households**

1. What are the major sources of livelihoods of the people in these communities? (Probe for crop farming, fishing, trading, civil service, livestock etc. Also probe for gender in relation to the livelihood sources).
2. Could you please tell me the major climate and non-climate related hazards experienced by households in this community? (Probe for drought, floods, irregular rains and extreme temperatures, poor soil fertility, crop pests and disease, high inputs prices, problem with output sale, difficulty accessing farming land etc.)
3. Please how do you perceive these hazards (Probe for increasing, decreasing, remained the same, don't know).
4. How do the hazards identified in question 2 affect, disrupt and disturb households' livelihoods? (Probe for the impacts of these on farming and other livelihood sources)
5. Please how do these changes in weather impact/affect the environment? (Probe for land degradation, soil erosion, declining soil fertility, desertification, bushfires etc.)

6. What strategies/practices do households adopt to deal with the impacts of these hazards on livelihoods? (Probe for all possible in-situ adaptation strategies-irrigation, fertiliser application, changing planting dates etc.)
7. What challenges/barriers do these people face in using these strategies/practices? (Probe for gender, age, religion, level of education, financial constraints, also probe for how these barriers are removed etc.).

**SECTION C: Migration as a coping or an adaptation strategy to deal with the adverse effects of climate change.**

1. To what extent do people move out of this community?
2. Who moves out? (Probe for age, ethnicity, gender, dependent and independent movements among male youth and females).
3. To where do people move? (Probe for within the region, within the district, other parts of Ghana, to rural or urban locations, to other countries).
4. What factors/reasons account for their movements? (Probe for drought, floods, employment opportunities, hustle or search for opportunities, lack of farmlands, conflicts etc.)
5. Do they have a particular time/season that they move out and why? (Probe for dry season, rainy season? etc.)
6. What form of mobility/migration do people embark upon? (Probe for seasonal migration to urban areas, seasonal migration to rural areas, permanent migration from the settlement, number of years, short or long term abroad etc.)
7. In your opinion, how do households use migration as a strategy to deal with adverse effects of climate change? (Probe for means of coping, receipt and use of remittances etc.)
8. Can you tell me the effects of people's movements on the community/district? (Probe for both negative and positive development).
9. What factors account for the non-migration of some household members? (Probe for lack of funds, obligation at home, etc.)

**SECTION D: The role of national policies and local institutions in shaping livelihoods and migration**

1. What laws/regulations/norms regulate your farming activities in this community? (Probe for the institutions that formulated these laws, and the negative and positive effects of these laws/regulations/norms).
2. Are you aware of any initiatives/programmes/policies in this community, regional and national that address farming and outmigration? (*Probe for SADA, IVID, IDIF, PFJ etc.*).
3. Can you mention the actors and institutions that are addressing your livelihood challenges and outmigration in this community? (Probe for formal and informal local institutions and actors – Agriculture extension services, NGOs, family and friends, religious leaders, women/farmers groups, microfinance etc.)

4. Who do their activities affect most and how? (Probe for women, aged, children, farmers etc.)
5. Aside these initiatives, what other forms of assistance/support do you receive for your farming activities? (Probe for the sources and forms of assistance, also probe if any conditions are attached).
6. How far are these supports shaping your farming and human migration?
7. Please what other services are available to the people in the district/community? (Probe for health, education, roads, water, market etc.)
8. Are there any institutions (formal or informal) or groups that facilitate migration in this community? (Probe for these institutions, diaspora network, and hometown associations).



## APPENDIX C

### INTERVIEW GUIDE FOR KEY INFORMANTS/INSTITUTIONAL HEADS

#### Governance, Climate change and Migration in the Upper West Region of Ghana

##### Introduction

Dear Sir/Madam,

Richard Seyram is my name, a Ph. D candidate from the University of Ghana, Centre for Migration Studies. I am conducting a study on Governance, Climate Change and Migration in your community as part of my course requirements in Migration Studies. This study aims to examine the relationship between governance, climate change and migration in Ghana. Your policy/ institution is key for examining the governance context of this study. I would, therefore, like to have some discussions with you in relation to the above topic. Your involvement is considered very crucial for the success of this thesis. Please, be rest assured that the views that will be expressed here are only meant for academic purposes and will not be traced back to you. Please you have the liberty to discontinue with the interview at any time. Nonetheless, your opinions will be greatly appreciated.

##### **The role of NGOs in shaping livelihoods, adaptation and migration**

1. Could you give me a brief background and objectives of your Organisation?
2. Please highlight some of the strategic programmes this organisation undertakes to transform livelihoods in the study areas (Probe for financial support- loans, etc.; input – seeds, fertilizers, agrochemicals; and training - agronomic/adaptation practices, non-agronomic practices)
3. In what ways are these livelihood transformation programmes promoting/discouraging adaptation to the adverse effects of climate change?
4. What are the implications of these activities/practices/programmes for migration (Probe for whether the practices encourage or discourage migration?)
6. What challenges hinder the organization from realizing its objectives?

##### **The role of the National Fertiliser Subsidy Programme in shaping livelihoods, adaptation and migration**

1. Could you give me a brief background and objectives of this policy/programme?
2. Please what is the current state of this policy/programme? (Probe for the availability, increase or decrease of fertiliser supply, farmers' access – price, location etc.)
3. Please how is this policy influencing (hindering or promoting) agrarian livelihoods in the district? (Probe for number of farmers who receive and are trained on its application etc.)
4. In what ways is this policy/programme shaping adaptation to climate change? (Probe for how the policy helps to adapt to climate change or otherwise)

5. What are the implications of the policy for migration (Probe for whether the policy encourages or discourages migration, determine how in each case).
6. What challenges hinder the policy from realizing its objectives?

**The role of the National Policy on Dams (1V1D) in shaping livelihoods, adaptation and migration**

1. Could you give me a brief background and objectives of this policy?
2. Please what is the current state of this policy/programme? (Probe for the availability and viability of the dams – water level in the dams etc.)
3. Please how is this policy influencing (hindering or promoting) agrarian livelihoods in the district? (Probe for its irrigation potentials, how many farmers are affected etc.).
4. In what ways is this policy/programme shaping adaptation to climate change? (Probe for how the policy is helping households to adapt to climate change or otherwise)
5. What are the implications of the policy for migration (Probe for whether the policy encourages or discourages migration, determine how in each case).
6. What challenges hinder the policy from realizing its objectives?

**The role of the SADA in shaping livelihoods, adaptation and migration**

1. Could you give a brief background and objectives of the SADA/NDA?
2. Please highlight some of the strategic programmes that sort to transform livelihoods under this policy (Probe for the accelerated agricultural production for small-holders, agro forestry, dry season farming etc.)
3. Please what is the current state of these programmes?
4. In what ways are these livelihood transformation programmes helping or discouraging adaptation to climate change?
5. What are the implications of the policy for migration (Probe for whether or not the policy results in migration or immobility?)
6. What challenges hinder the policy from realizing its objectives?

**The role of the District Department of Agriculture in shaping livelihoods and migration**

1. Could you highlight the major activities your department undertakes to improve agriculture and livelihood activities of households in the district?
2. Please highlight some of the strategic programmes this organization undertakes to transform livelihoods in the study areas (Probe for financial support- loans, etc.; input – seeds, fertilizers, agrochemicals; and training - agronomic/adaptation practices, non-agronomic practices)
3. In what ways are these programmes promoting/discouraging adaptation to the adverse effects of climate change?
4. What are the implications of these activities/practices/programmes for migration? (Probe for how the policy shapes migration decision of households.)