

**CLIMATE CHANGE ADAPTATION: INTRA-HOUSEHOLD GENDER RELATIONS
AND THE DECISIONS OF SMALLHOLDER WOMEN FARMERS IN UGANDA**

by

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ABSTRACT

Climate change adversely impacts the livelihoods of smallholder farmers in the Global South. However, women experience severe effects due to adaptation decision-making constraints. The majority of studies explain these constraints on the basis of inequities in gender relations with limited focus on the contribution of the interactions between formal and informal gendered institutions even though, impediments to adaptation decision-making may link to gendered institutions. My thesis deviates from the majority of previous studies in that it makes a contribution by investigating the influences of the interconnection between the interactions of gendered institutions and intra-household gender relations. I conceptualise gendered institutions as formal and informal rules that impose gendered implications on the capacities of women and men to decide how to adapt to climate change. Adaptation decisions are conceived with respect to the liberty to choose from available adaptation strategies, appropriate implementation of adaptation strategies and adaptation intensity.

This study is guided by two distinct but related theoretical perspectives – Feminist Political Ecology (FPE) and Social Relations Approach (SRA). Helmke and Levitsky's (2004) categorisation of formal and informal institution interactions – complementary, accommodation, competition and substitution – is integrated to elucidate analysis of gendered institution interactions. These theoretical perspectives facilitate nuanced comprehension of the interlinkages between interactions of gendered institutions and intra-household gender relations and their effects on women's adaptation decision-making. This research was conducted in Uganda where rain-fed smallholder agriculture is the primary source of survival and women play a critical role. Participatory research methods were employed to collect empirical data and document review to generate secondary data to complement detailed understanding of the

interactions of gendered institutions. Data was thematically analysed. NVivo software aided the analysis of empirical data whilst the secondary data was analysed manually.

This study interrogates how the interactions between gendered institutions and their interlinkages with intra-household gender relations shape the abilities of women farmers to make adaptation decisions. Investigations are undertaken by examining, intra-household gender relations that women navigate in adaptation decision-making, how gendered institutions interact with each other and with intra-household gender relations and the climate change experiences of women farmers and decisions about how to adapt to climate change. My study reveals that, constraints to the abilities of women farmers to make adaptation decisions are, constructed and continually being reconstructed through the interrelationships between the interactions of formal and informal gendered institutions and intra-household gender relations. Therefore, I argue that, whilst informal gendered institutions, such as cultural norms and patriarchal household rules, often sabotage the intended gender equity outcomes of formal institutions conversely, they also provide women (and sometimes men) with the opportunity to develop creative agency. This facilitates women's navigation of gender disparities and space to negotiate adaptation decisions.

DEDICATION

To my beloved husband Mr. Joseph Ofamba and children Charity, Ruth and Daniel.

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I would like to appreciate the Lord God Almighty from whom I draw knowledge and wisdom for His sustenance throughout my PhD journey!

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ACRONYMS

ASSP	Agricultural Sector Strategic Plan
CCFU	Cross Cultural Foundation of Uganda
EOP	Equal Opportunities Commission
ERP	Economic Recovery Programme
FAO	Food and Agricultural Organization
FGD	Focus Group Discussion
FPE	Feminist Political Ecology
FTB	Finance Trust Bank
IFDC	International Fertilizer Development Centre
ILO	International Labour Organisation
IPCC	Intergovernmental Pannel on Climate Change
LCI	Local Council One
MAAIF	Ministry of Agriculture Animal Industry and Fisheries
MDGs	Millenium Development Goals
MWE	Ministry of Water and Environment
NAES	National Agricultural Extension Strategy
NAP	National Planning Authority
NDC-PP	Nationally Determined Contribution Partnership Plan
NDP	National Development Plan
PMA	Plan for Modernisation of Agriculture
SAPs	Structural Adjustment Programmes
SDGs	Sustainable Development Goals
SRA	Social Relations Approach
UBOS	Uganda Bureau of Statistics
UN Women	United Nations Women
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNMA	Uganda National Metrological Association
URCS	Uganda Red Cross Society
WB	World Bank
WBG	World Bank Group
WMO	World Metrological Organisation

CHAPTER ONE: INTRODUCTION

1.0 Research problem

Climate change and its adverse effects on human survival is a global concern. The changes in the climate manifest through recurrent variation in rainfall patterns, precipitation, temperature and rise in sea levels causing floods, droughts, heatwaves and high incidence of pests and diseases (Assan *et al.*, 2018; Awiti, 2022; Clayton, 2020; Rao *et al.*, 2019; Painter, 2020). Adaptation is widely advanced as a critical and inevitable response to climate change and its associated effects (IPCC, 2023; Kandel *et al.*, 2024). However, smallholder female farmers experience impediments in adapting to climate change due to limited capacity to make adaptation decisions in comparison to male household heads (Aryal *et al.*, 2022; Assefa and Gebrehiwot, 2023; Bob and Babugura, 2014; Kristjanson *et al.*, 2017; Rao *et al.*, 2019; Wrigley-Asante *et al.*, 2019).

The impediments that women farmers face in adaptation decision-making compromises their ability to adapt to climate change using strategies that effectively alleviate climate threats. Consequently, the climate adaptation decisions of women farmers are restricted to specific adaptation strategies that may be ineffective in moderating the risks of climate change (Assan *et al.*, 2018; Lawson *et al.*, 2020; Van Aelst and Holvoet, 2018; Wrigley-Asante *et al.*, 2019; Zakayo *et al.*, 2021). The situation of women farmers differ from that of male household heads. Male household heads are commonly noted to have the ability to employ diverse on-farm and off-farm adaptation measures and also have the capacity to integrate multiple strategies to enhance effective response to climate risks (Ackerl *et al.*, 2023; Adzawla *et al.*, 2019; Belay *et al.*, 2017).

Previous studies have explained constraints to women's adaptation decisions. Most studies attribute hinderances that female farmers experience in deciding how to adapt to climate change to disparities in gender relations (Anaglo, Boateng and Boateng, 2014; Assefa and Gebrehiwot, 2023; Badstue *et al.*, 2020; Blaikie *et al.*, 2014; Bomuhangi *et al.*, 2016; Deschênes, Dumas and Lambert, 2020; Diarra *et al.*, 2021; Erwin *et al.*, 2021; Mogomotsi *et al.*, 2020; Muzari, 2016; Nyantakyi-Frimpong, 2019; Van Aelst and Holvoet, 2018). In the majority of studies that associate limitations to women's adaptation decision-making to gender relations, the contributing effects of cultural norms in configuring gender inequities in resource access, division of responsibilities and power are elucidated. Besides cultural norms, a form of informal gendered institution, some studies attribute the hinderances that females experience in adaptation decision-making to gaps in formal gendered institutions such as agricultural policies and regulations. Institutional gaps in delivery of agricultural extension services, implementation of climate adaptation programmes and policies are demonstrated to inhibit adaptation decisions of women farmers (Ampaire *et al.*, 2020; Arora *et al.*, 2017; Bomuhangi, 2016; Garcia, Tschakert and Karikari, 2020; Lawson *et al.*, 2020; Ongoro and Ogara, 2012; Rao *et al.*, 2019; Shackleton *et al.*, 2015).

The literature evidences that, hinderances to adaptation decisions of women farmers are constructed by inequities in gender relations that are configured by *both* formal and informal gendered institutions. This study departs from the majority of gender and climate adaptation literature in that it focuses on the interactions between gendered institutions. This is because formal and informal gendered institutions may interactively interrelate with intra-household gender relations and the capacities of female farmers

to make adaptation decisions. Two influential, but distinct, theoretical perspectives – Feminist Political Ecology (FPE) and Social Relations Approach (SRA) – emphasise the significance of examining the interactions between institutions and their interlinkages with gender relations and environmental decisions. FPE perspectives illuminate the interconnections between institutions, their interactions, inequities in gender relations and their effects on environmental decisions (Rocheleau *et al.*, 1996; Elmhirst, 2016). Relatedly, SRA arguments assert that the interactions between institutions construct imbalances in gender relations that impact women's livelihoods. But it hardly focuses on the effect of the interactions of gendered institutions on climate adaptation decisions. This research draws from FPE perspectives to understand how the interactions of gendered institutions enhance or impede the abilities of female farmers to make adaptation decisions. SRA is incorporated to guide the comprehension of the interactions between gendered institutions and interlinkage with intra-household gender relations. Helmke and Levitsky's (2004), perspectives are also integrated to further elucidate the forms of institution interactions. The above perspectives facilitate *holistic* understanding of how gendered institutions interact and how these interactions improve or inhibit the abilities of women to make adaptation decisions.

The relationships between formal and informal gendered institutions, asymmetrical intra-household gender relations and hinderances to adaptation decisions of smallholder women farmers are evidenced in previous studies (e.g. Bhattarai, 2020; Bomuhangi, 2016; Ravera *et al.*, 2016). But rarely are the interlinkages between interactions of gendered institutions and intra-household gender relations and their influence on adaptation decisions interrogated in-depth. Since gender relations are nested with institutions, 'adaptation rarely occurs in an institutional vacuum' (Agrawal,

2009, p.178; see also Anyidoho, 2020; Kabeer, 1994; Rocheleau *et al.*, 1996). Therefore, I argue that it is critical to interrogate the interactions of gendered institutions and their connection to adaptation decision-making abilities of female farmers. My research contributes to addressing the gap discussed above by, investigating how interactions between gendered institutions interlink with intra-household gender relations and configure adaptation decisions of women farmers. This study is undertaken by examining, intra-household gender relations, interactions of gendered institutions and adaptation decisions of women farmers. My study contributes to knowledge by demonstrating the interwovenness of constraints to adaptation decision-making abilities of female farmers with the interactions of gendered institutions. This provides *holistic* rather than *simplistic* understanding of hinderances that women confront in adaptation decision-making thus unravelling the complex interconnection of factors that configure women's adaptation decisions. Furthermore, this study makes recommendations for enhancing gender equity in adaptation to climate change.

1.1 Justification for Uganda

Though my justification for focusing on Uganda will be elaboratively discussed later (cf. section 4.3.2), I provide a brief explanation for selecting Uganda as my study focus. The basis for this decision is informed in part by my positionality as a Ugandan national who has lived and worked in rural communities with livelihood experiences and socio-cultural contexts similar to those of the areas where I undertook fieldwork. This positionality is useful in gaining contextual and in-depth understanding of the research problem. Besides that, Uganda provides an appropriate context for gaining detailed understanding of the interactions of gendered institutions and their interrelationship with intra-household gender relations and configuration of adaptation decisions of women farmers. In Uganda, approximately 80 percent of households derive their

livelihoods from rain-fed agriculture and more women (87 percent) than men (74 percent) depend on agriculture for survival (NDP-III, 2020; UBOS, 2022). However, the climate in Uganda is variable, characterised by climatic events such as floods, landslides, droughts, thunderstorms, strong winds and hailstorms (NPA, 2015; OXFAM, 2020; UBOS, 2022). These changes impact agricultural outputs and human livelihoods. In addition, changes in the climate also portends that women farmers in Uganda experience climate change and practice adapting to climate risks. Due to the centrality of agriculture to Uganda's economy, the government, alongside development partners such as the United Nations and World Bank have instituted policies, programmes and projects to address farming challenges such as climate change (Ampaire *et al.*, 2017; NDP-III, 2020; Walaga *et al.*, 2005). Despite these efforts, adaptation decision-making is still a challenge to smallholder farmers in Uganda, especially women (Ampaire *et al.*, 2017; Apuuli *et al.*, 2000; Charlotte, 2020; Cooper and Wheeler, 2015; NDP-III, 2020). The hinderances that women face in making adaptation decisions despite institutional interventions highlight the complexities that circumscribe climate adaptation decision-making.

Moreover, most rural communities in Uganda are traditional and patriarchal with strong cultural norms, beliefs and value systems that shape familial relationships (Katungi, Edmeades and Smale, 2008; Theeuwien *et al.*, 2021). Cultural norms are noted to construct resources, responsibilities and power relations between household members (Barak *et al.*, 2024; Bategeka, Kiiza and Kasirye, 2013; Charlotte, 2020; Sengupta and Calo, 2016). These relationships can be typified by equities or inequities. The above aspects reflect the formal and informal gendered institutions (policies and cultural norms), intra-household gender relations and climate change contexts within which smallholder women farmers decide how to adapt to climate

change. This context enhances in-depth comprehension of the interactions of gendered institutions, their interlinkages with intra-household gender relations and influence on adaptation decisions drawn from the experiences of smallholder women farmers.

1.2 Study motivation

The inspiration to undertake this study was informed by two aspects. The first one is my interest in climate change adaptation as a strategy for alleviating increasing climate induced livelihood challenges. The second aspect is limited climate change adaptation decision-making capacities of smallholder women farmers. In gender and climate change adaptation discussions on Africa, gender relations are asserted to configure socio-economic vulnerabilities that constrain the capacity of women farmers to make adaptation decisions. Coupled with the relationships between females and males, hinderance to the abilities of women to make adaptation decisions also relate to formal and informal gendered institutions. Gendered institutions such as policies, programmes and cultural norms can exacerbate gender disparities in adaptation decision-making by marginalising the needs and interests of women farmers (Ampaire *et al.*, 2020; Ampaire *et al.*, 2017; Anyidoho, Crawford and Medie, 2021; Kowero, Campbell and Sumaila, 2003). This demonstrates the significance of examining the interactions between gendered institutions and their interlinkage with intra-household gender relations to gain a better understanding of adaptation decisions of women farmers and their consequent effects on the livelihoods of women in Africa and Uganda in particular.

1.3 Main objective

My study aims to understand how household members relate with each other with respect to resources, responsibilities and power and the influences of these relationships on adaptation decisions of smallholder women farmers.

1.4 Main research question

How do the interactions of gendered institutions and their interconnections with intra-household gender relations influence climate adaptation decisions of smallholder women farmers in Uganda?

1.4.1 Specific questions

- i. What intra-household gender relations do smallholder women farmers navigate in adaptation decision-making?
- ii. How do gendered institutions interact with each other and with intra-household gender relations?
- iii. What are the experiences of smallholder women farmers with climate change and how do they decide to adapt to climate change?

1.5 Research design

To investigate how the interactions between gendered institutions interrelate with intra-household gender relations and shape adaptation decisions of women farmers, I adopted qualitative research design and case study approach. In qualitative research, words and images are relied upon as data (Clarke and Braun; 2013; Rowley, 2012; Saunders, Thornhill and Lewis, 2019). The case study was useful because it aligns with qualitative research (Harrison *et al.*, 2017). It facilitates in-depth understanding of phenomena from the opinions, attitudes, experiences, processes, behaviours or predictions of participants (Heale and Twycross, 2018; Yin, 2018). Besides that, a

case study is consistent with the philosophical underpinnings of this study, constructivism and interpretivism (Bryman, 2015; Symon & Cassell, 2012). Guided by the research design of this study, I selected Uganda as my case and undertook fieldwork in two rural districts.

Data was collected from women farmers (25) and key informants (Five) (agricultural, gender and climate change adaptation officers) using qualitative participatory research methods. I used semi-structured interview, focus group discussion (FGD), gender resource mapping, Venn diagram, gender disaggregated seasonal calendar and transect walk to collect data. Through these methods, detailed and useful data for the study was collected (Vaughn and Jacquez, 2020). Much as my data was majorly empirical, some data was secondary. I collected secondary data by reviewing policy, reports and legislation documents to enhance in-depth understanding of gendered institutions that impose gendered implications on farmers climate adaptation capacities and their interactions. I analysed data thematically with the aid of NVivo software for empirical data. The secondary data was manually analysed. My research design and overarching methodology is discussed in detail in Chapter 4.

1.6 Core overarching research constructs

The core overarching constructs used in this research are adaptation decisions, intra-household gender relations, gendered institutions and interactions of gendered institutions. Since my research anchors on these constructs, gaining clear understanding of their interpretation and application facilitates in-depth comprehension of the discussions in my thesis.

1.6.1 Climate adaptation decisions

To gain clarity on the conceptualisation of climate adaptation decisions, I first start by defining adaptation to climate change even though I explore adaptation decisions in-depth later (cf. section 3.2). Adaptation to climate change is broadly interpreted as adjustments to the actual or expected changes in the climate and their effects (IPCC, 2022; Parry *et al.*, 2007; UNDP, 2024). In the context of smallholder agriculture, these adjustments include using on-farm and off-farm adaptation strategies that are implemented to moderate the negative effects of climate change (Adzawla *et al.*, 2019; Gordon, Odame and Victor, 2019; Twyman *et al.*, 2014). This definition of climate adaptation underscores the ecological and socio-economic benefit of adaptation practices. It further draws attention to the centrality of climate adaptation in alleviating the detrimental impacts of climate change despite smallholder women farmers struggling with adaptation as discussed above (cf. section 1.2). Adaptation struggles of smallholder women farmers relate to decisions about where to practice adaptation measures, when and how to adapt to climate change (Bikketi *et al.*, 2016; Bomuhangi *et al.*, 2016; Orlove *et al.*, 2020).

In line with the above observations, climate adaptation decisions have been defined as decisions that result in actions that impact adaptation (Orlove *et al.*, 2020; Siders and Pierce, 2021). Adaptation decisions can impact climate adaptation in the sense that they can enhance or constrain effective moderation of climate risks. This accounts for the significance of interrogating adaptation decisions to gain nuanced understanding of how women farmers adapt to climate change. In my study, adaptation decisions are conceptualised as decisions that involve adaptation strategies, integration of different adaptation measures and the methods employed to implement adaptation strategies. Therefore, I investigate the on-farm and off-farm

adaptation strategies that women farmers decide to implement, the extent to which women integrate different strategies when adapting to the climate and the ways through which female farmers implement adaptation strategies.

1.6.2 Intra-household gender relations

Intra-household gender relations are interpreted variedly in the literature. In my study, the conceptualisation of intra-household gender relations and its application is informed by perspectives from previous studies. In the majority of literature, intra-household gender relations are interpreted as relationships between household members such as men, women and children, with respect to resources, responsibilities and decision-making power (Doanh *et al.*, 2015; Ngigi, Mueller and Birner, 2016; Mehraban *et al.*, 2022; Mntambo, 2017; Mwaseba and Kaarhus, 2015; Seebens, 2011; Tambulasi, Mkwambisi and Kamoto, 2021). In some studies, the conceptualisation of intra-household gender relations have been expounded beyond resources, responsibilities and power relations between household members. It includes different attitudes, abilities, desires, personalities and behaviour patterns ascribed to females and males as well as other forms of human relations and with institutions and processes (Agarwal, 1997; Anyidoho, 2020; Nyamekye and Oppong-Mensah, 2016). The above perspectives illustrate that intra-household gender relations not only concern relationships between household members but rather involves institutions such as policies, legislation and cultural norms that configure relationships in households.

Most evidence in the literature demonstrates that intra-household gender relations are commonly asymmetrical and that they advantage men and disadvantage women (Ampaire *et al.*, 2020 Aryal *et al.*, 2022; Bikketi *et al.*, 2016; Kristjanson *et al.*, 2017;

Lawson *et al.*, 2020 Van Aelst and Holvoet, 2016; Xie, 2021; Xie, 2019). Since formal and informal institutions are noted to interlink with intra-household gender relations (e.g. Ampaire *et al.*, 2020; Ampaire *et al.*, 2017; Jütting *et al.*, 2007), gendered institutions may construct gender equities or inequities in intra-household gender relations. I question the relationships between women and men with respect to resources, responsibilities and power and their implications on women's adaptation decisions. I recognise that these relationships are linked to the interactions of gendered institutions. Intra-household gender relations and their linkages to adaptation decisions of smallholder women farmers are discussed in detail in Chapter three (cf. section 3.2).

1.6.3 Gendered institutions

The interpretation of gendered institutions in my study embodies two concerns. 'What are institutions?' and 'What are gendered institutions?' Institutions are widely described as rules of the game that shape social interactions in political, economic and social spaces (Hodgson, 2006; Kabeer, 1994; Lowndes, 2020; North, 1990). In other studies, formal rules such as policies, legislation and procedures and informal rules such as cultural norms and codes of conduct are further described as the means for achieving socio-economic ends (Helmke and Levistky, 2004; Kabeer and Subrahmanian, 1996; North, 1990; Makina and Moyo, 2016; Waylen, 2014). The socio-economic ends referred to herein may relate to gender equity in intra-household gender relations and climate adaptation decision-making. Whilst bearing in mind the 'plural and patchy' nature of institutions and their functionality, the entrenchment of gender in institutions and gendered outcomes of institutions, all institutions can be described as gendered (Acker, 1992; Chappell, 2010; Mackay, 2011; Makina and Moyo, 2016; Whaley, 2022, p.37). However, the above perspectives have been

criticised on the basis that if all institutions are interpreted as gendered then the concept 'gendered institutions' becomes complex and meaningless (Rothstein, 1996). Such lack of meaning may complicate the examination of gendered institutions, their interlinkages with intra-household gender relations and effects on adaptation decisions of women farmers. It further accounts for the relevance of the definitive interpretation of gendered institutions.

In some literature, gendered institutions are described as rules that specifically address gender, produce gendered effects and outcomes and involve actors who have genders and have also been gendered (Lowndes, 2020). This interpretation provides specific parameters for describing gendered institutions. I therefore conceptualise gendered institutions as institutions that impose intended and unintended gendered implications on the capacities of farmers to adapt to climate change such as the Land Act, National Agricultural Extension Strategy (NAES) principles and cultural norms. I investigate gendered institutions whilst mapping their interconnections to intra-household gender relations. A comprehensive exploration of gendered institutions is undertaken later (cf. section 3.3).

1.6.4 Interactions of gendered institutions

Building on the interpretation of gendered institutions discussed in the previous section, interactions of gendered institutions manifest differently. Formal and informal gendered institutions interact when they co-exist in ways that enable or constrain the achievement of desired outcomes that may be similar or divergent (Helmke and Levitsky, 2004; Kabeer, 1994; Kenny, 2007; Young, 2002). This underpins the interactions between gendered institutions such as NAES principles and cultural norms that domesticate women as means for achieving desired outcomes in different

institutional spaces where interactions occur such as the family, community, market and state (Amaru and Chhetri, 2013; Kabeer and Subrahmanian, 1996; Osei-Tutu, Pregernig and Pokorny, 2015; Rocheleau *et al.*, 1996). This implies that gendered institutions may collaborate, cooperate or coordinate with each other even in situations where their objectives conflict. Based on this, the interactions between gendered institutions may be considered to be complementary, accommodative, competitive or substitutive, revealing how interactions enhance or undermine the realisation of intended institutional outcomes (Helmke and Levitsky, 2004; Wang, 2020). These interactions interrelate with intra-household gender relations and configure adaptation decisions of women farmers. In my study, the interactions between gendered institutions are perceived to interconnect with intra-household gender relations constructing equities and inequities and hypothesised to influence women's adaptation decisions. This study examines the ways in which gendered institutions interact with each other and interrelate with intra-household gender relations. It also questions the effects of these interrelationships on the abilities of smallholder women farmers to make adaptation decisions.

1.8 Thesis structure

My thesis consists of eight Chapters. The first four form the contextual and foundational Chapters. Chapter one provides the research context. It concentrates on the study focus, highlights research concerns and how the study was undertaken. It further foregrounds discussions on how gendered institutions interact with each other and with intra-household gender relations and influence adaptation decisions of smallholder women farmers. Chapter two discusses the background of this study. It explores smallholder agriculture, climate change, intra-household gender relations and maps gendered institutions that impose gendered implications on farmers climate

adaptation capacities in Uganda. Chapter three focuses on literature review in relation to climate adaptation decisions, intra-household gender relations and interaction of gendered institutions and their interconnections. The literature review identifies the linkage between interactions of gendered institutions and adaptation decisions of women farmers which guide my adoption of the theoretical underpinnings (FPE and SRA) and designing of a conceptual framework. Chapter four covers the methodology. It explains how this study was undertaken. It discusses the ontological and epistemological commitments of this research as well as the research design, methods of data collection and analysis.

The second category are the empirical Chapters. Chapter five, on intra-household gender relations, discusses relationships between household members with respect to resources, responsibilities and power. It reveals symmetries and asymmetries in intra-household gender relations guided by FPE perspectives. Chapter six, on gendered institutions and their interactions, focuses on two aspects guided by FPE, SRA and Helmke and Levistky's (2004) categorisation of formal and informal institution interactions. It analyses the interactions of gendered institutions with each other and with intra-household gender relations revealing the construction of equities and inequities and their influences on adaptation decisions of women farmers. Chapter seven, on adaptation decisions of women farmers, describes adaptation strategies, the extent of adaptation intensification and methods of implementing adaptation strategies. The discussions also show linkages between adaptation decisions of women farmers and interactions of gendered institutions. As noted in my earlier discussion (cf. section 1.6), the focus of my study is to understand adaptation decisions of smallholder women farmers and does not involve examining the effectiveness of women's adaptation decisions in alleviating climate risks. However,

whilst exploring adaptation decisions, I demonstrate the connections between adaptation decisions of women farmers and effective climate adaptation. The last Chapter, eight, synthesises the study results and discusses these in relation to my research questions. It further identifies the contribution this research makes to knowledge, policy recommendations and areas for future research. The summary of the thesis structure is represented in Table 1 below.

Table 1: Thesis structure

Chapter	Title	Purpose
One	Introduction	Foregrounds study discussions
Two	Background	Contextualises the study
Three	Literature review	Situates the study within existing literature
Four	Methodology	Explains how the study was undertaken
Five	Intra-household gender relations	<u>Research question One</u> Explores gender relations among household members with respect to resource access and control, divisions of responsibilities and power relations
Six	Gendered institutions and their interactions	<u>Research question Two</u> Examines the mediation of intra-household gender relations by interactions of gendered institutions
Seven	Adaptation decisions of smallholder women farmers	<u>Research question Three</u> Examines the influences of intra-household gender relations configured by interactions of gendered institutions on adaptation decisions of smallholder women farmers
Eight	Conclusion	Synthesises study results, discusses contribution to knowledge, draws conclusions and recommendations

Source: Researcher (2024)

CHAPTER TWO: BACKGROUND

2.0 Introduction

This Chapter discusses the background of this study in connection to climate adaptation decisions of smallholder women farmers in Uganda. It provides an overview of Uganda's smallholder agriculture, intra-household gender relations and climate change and adaptation. Within these discussions, gendered institutional contexts that relate to the above aspects are also explained. The exploration in this Chapter provides the context for understanding how interactions of gendered institutions with each other and with intra-household gender relations influence adaptation decisions of smallholder women farmers. This Chapter is organised in four sections. Section 2.1 centres on smallholder agriculture and its significance to the livelihoods of women farmers. The changes in smallholder farming before and after the cash-crop revolution is explained later (cf. section 2.1) with specific focus on agricultural policy reforms that have been advanced to improve agricultural production are discussed. This section also deduces the implications that changes in small-scale agriculture impose on adaptation decisions of women farmers. In 2.2, intra-household gender relations are discussed whilst highlighting changes that shaped relationships between household members in pre-colonial, colonial and post-colonial Uganda. These changes are discussed with respect to resources, responsibilities and power conceptualised in this thesis as the major components of intra-household gender relations (cf. section 1.6.2). Discussions also draw links between changes in intra-household gender relations and adaptation decisions of smallholder farmers. The exploration of climate change and adaptation is undertaken in section 2.3. In this section, the state of the climate, its effects on human livelihoods, institutional interventions and their connection to adaptation decisions of smallholder women

farmers are discussed. Lastly, 2.4 provides a Chapter conclusion. It highlights the key issues discussed in this Chapter and draws connections between the major issues explored and adaptation decisions of smallholder women farmers in Uganda.

2.1 Uganda's smallholder agriculture

The majority of Uganda's population derive their livelihood from agriculture. Statistics show that about 80 percent of the working population is employed in the agricultural sector (UBOS, 2022). This trend is consistent with the rest of Africa where agriculture employs about 60 percent of the total population with 80 percent of its products drawn from smallholder farmers (FAO *et al.*, 2019; FAO *et al.*, 2018). The World Bank statistics of 2019 indicates that about 77 percent of women in Uganda work in the agricultural sector (ILO, 2021). They invest most of their labour and spend long hours working in the fields (UBOS, 2020). Even though both large-scale and smallholder farming is practiced in Uganda, it is shown that 8.4 million hectares of land is regarded as small-scale farming plots whereas about 68,400 hectares is large-scale farmland (Daily Monitor, 2014). Relatedly, most farmers are noted to practice rain-fed agriculture on less than One acre of land majorly for subsistence (UBOS, 2022; Wanyama, 2016). This is consistent with the description of smallholder agriculture in my thesis and previous studies (e.g. Cohn *et al.*, 2017; Graeub *et al.*, 2016). This evidence underpins smallholder agriculture as the most pronounced farming system and source of livelihood in Uganda especially to women farmers (Mubiru *et al.*, 2018; Mwavu *et al.*, 2018; Reynolds *et al.*, 2020). Women's strong reliance on smallholder agriculture as a source of livelihood in Uganda and other parts of Africa has been attributed to their limited involvement in other livelihood pathways in comparison to male farmers who practice trade, livestock production and engage in off-farm paid

work (EOC and UN Women, 2017; Jost *et al.*, 2016; Owusu and Yiridomoh, 2021; Rietveld (Anne), van der Burg (Margreet) and Groot (Jeroen), 2020).

Before the cash-crop revolution, described as the early colonial period characterised by expansion in Africa's agricultural production and the spread of traditional cash crops, smallholder agriculture in Uganda was noted to adequately address food and welfare needs of farmers including women farmers (De Haas, 2020; NPA, 2013; Tosh, 1980). However, this changed during the cash-crop revolution period because men largely took control over land and focused majorly on cash crop farming, leaving women with small pieces of land to cultivate food crops (De Haas, 2014). This shifted gender relations in households and impacted women's engagement in decision-making, as explored later (cf. section 2.2). Between 1970 and 1986 – the post-colonial period – there was a decline in agricultural production which affected food availability. (Joughin and Kjær, 2010; NPA, 2013). This decline has been attributed to political and socio-economic factors. Political instability such as Idi Amin's military dictatorial regime (1971-1979) and the Bush War of 1986 are noted to have significantly distracted farming activities thus impacting agricultural outputs (Matovu and Stewart, 2000; Sejjaaka, 2004). Other factors such as deterioration of soil fertility, limited access to farming inputs and climate variability and its resultant effects such as variations in rainfall patterns, floods, drought and high incidence of pests and diseases negatively affected agricultural outputs (Call, Gray and Jagger, 2019; Mubiru *et al.*, 2018; NPA, 2013; Salami, Kamara and Brixiova, 2010). The overview of climate change and adaptation is explored in section 2.3. Even though smallholder farmers were impacted by this decline irrespective of their gender, women were the most affected. Women farmers were greatly impacted due to their gender responsibilities and other socio-economic vulnerabilities such as limited access to resources (Atube *et al.*, 2021;

Ebanyat *et al.*, 2010). The vulnerabilities of smallholder women farmers in Uganda to the effects of low agricultural outputs corresponds with that of women farmers in other countries in Africa and illustrates difficulties that women face in adaptation decision-making (Assefa and Gebrehiwot, 2023; Aryal *et al.*, 2022; Bob and Babugura, 2014; Kristjanson *et al.*, 2017; Rao *et al.*, 2019; Wrigley-Asante *et al.*, 2019).

In recognition of the centrality of smallholder agriculture to rural livelihoods, the government of Uganda introduced agricultural policy reforms. From the 1980s, different reforms were instituted with the aim of addressing agricultural challenges and their adverse effect on agricultural outputs and livelihoods (Joughin and Kjær, 2010). During the post liberation war period (after the 1986 Bush War), the Economic Recovery Programme (ERP) was introduced in 1987 followed by Structural Adjustment Programmes (SAPs) in the 1990s (Joughin and Kjær, 2010; NPA, 2013). These institutional arrangements focused on the rehabilitation of infrastructure to facilitate the exportation of agricultural produce such as coffee and cotton and addressing technical and institutional encumbrances to agricultural development (NPA, 2013). Consequently, there was improvement in the annual growth of the agricultural sector between 1992 and 1996 but the welfare of smallholder farmers remained low with households struggling with food insecurity and low income levels (NPA, 2013; Opolot and Kuteesa, 2006). The 1987 and 1990 institutional reforms seldom focused on gender issues in small-scale agriculture (UBOS, 2012). For instance, boosting agricultural exports benefits men much more than women, who mainly farm for subsistence (Bamwesigye *et al.*, 2020; Mubiru *et al.*, 2018; Reynolds *et al.*, 2020). These imbalances construct unequal adaptation decision-making opportunities for women and men farmers and denote the livelihood difficulties that women farmers experience.

The persistent livelihood struggles of smallholder farmers despite the introduction of the ERP and SAPs demonstrate their impoverishment, deficiencies in policy design and/or implementation in correspondence with observations of previous studies (Konadu-Agyemang, 2000; Noyoo, 2022). These gaps informed the government's introduction of a programme that has been described as holistic, the Plan for Modernisation of Agriculture (PMA), between 2001 and 2009 (NPA, 2013; Yami *et al.*, 2019). PMA had seven focus areas: research and technology, technology systems and pathways, agricultural education, national agricultural advisory services, rural agricultural financing, agro-processing and marketing and sustainable natural resource utilisation and management (NPA, 2013, Oxford Policy Management, 2005). PMA aimed at enhancing agricultural production and transforming subsistence farming into commercial agriculture (NPA, 2013). Despite PMA's implementation and its recognition of gender disparities in agricultural production, not much was achieved in the context of gender equity and improved production in smallholder agriculture (UBOS, 2012). Some progress was observed in two focus areas, agricultural research and national agricultural advisory services (NPA, 2013). As a result, low agricultural outputs and food insecurity persisted among smallholder farmers (Mwesigwa, Oguta and Acanga, 2023; NPA, 2013; Oxford Policy Management, 2005).

The shortfalls of PMA occasioned development of agricultural sector specific development plans in line with PMA's priority areas. A five year Agricultural Sector Development Strategy and Investment Plan (ASDSIP) 2010/11 - 2014/15 which aligned with the focus areas of the National Development Plan (NDP) 2010/11 - 2014/15 was developed (NPA, 2013; MAAIF, 2015). However, similar to the institutional reforms discussed above, the implementation challenges of ASDSIP

contributed to a decline in agricultural production between 2010 and 2012 (NPA, 2013; MAAIF, 2015). Resultantly, the Agricultural Sector Strategic Plan (ASSP) 2015/16 - 2019/20 was adopted in correspondence with the priorities of NDP-II 2015/16 - 2019/20. This plan was further evaluated and reviewed after five years to enhance its effectiveness in boosting agricultural production and to align with NDP. Due to gaps in the achievement of improved agricultural outputs, gender equities in access and control over agricultural resource and food security and the need for ASSP to align with NDP, ASSP-II was revised to ASSP-III 2020/21 - 2024/25 and aligned to NDP-III 2020/21 - 2024/25 (IFAD, 2021; MAAIF, 2020; Oyua, 2019). ASSP-III centres on increasing agricultural production, access to critical farming inputs, agricultural marketing and value addition and agricultural service delivery (MAAIF, 2021). These revisions of ASSPs informed government's focus on provision of agricultural extension services as one of the major strategies of addressing farming challenges such as climate change, poor technology and limited agricultural knowledge and skills that adversely impacts agricultural production in both large and small-scale farming (Brenya and Zhu, 2023; NPA, 2013; Oumo and Cho, 2014; Pan, Smith and Sulaiman, 2018).

The commitment of the Government of Uganda to address challenges in the agricultural sector including those that affect smallholder farmers have further been demonstrated through adoption of regional and international agriculture related frameworks. In 2003, Uganda adopted the Comprehensive African Agriculture Development Framework compact, which was established to alleviate poverty and hunger through agriculture (NPA, 2013). In the same year, Uganda ratified the Maputo declaration and committed to allocating 10 percent of its budget to agriculture and the implementation of rural policies for a period of five years (NPA, 2013). These efforts

coupled with the adoption of international frameworks such as Millenium Development Goals (MDGs) and Sustainable Development Goals (SDGs) aimed at enhancing livelihoods including that of women who depend on smallholder agriculture (UBOS, 2019). Despite the above reforms and commitments, smallholder agriculture in Uganda is still characterised by low production with farmers such as females who strongly depend on it for survival struggling with low agricultural outputs, poor livelihoods and hunger (Ali *et al.*, 2016; FAO, 2023; Sell *et al.*, 2018; Theeuwes *et al.*, 2021). The shortcomings of smallholder agriculture has been associated with failed policy approaches that concentrate on cash crop agriculture and exportation, ignoring subsistence agriculture and the negative effects of climate change and limited access to agricultural extension services (Bagamba *et al.*, 2012; Call, Gray and Jagger, 2019; FAO, 2023; Wanyama, 2016). In the context of smallholder women farmers, resource related challenges that compromise agricultural production and policy focus on male dominated types of farming such as cash crop production is associated with intra-household gender relations (Ampaire *et al.*, 2017; Theeuwes *et al.*, 2021). Intra-household gender relations are discussed in the subsequent section.

2.2 Intra-household gender Relations in Uganda

Uganda is a patriarchal society with a rich cultural heritage and diverse ethnicities (Watson, Kyomuhendo and Ghimire, 2020). Intra-household gender relations explained in the previous Chapter with respect to resources, responsibilities and power are noted to interweave with cultural norms (cf. section 1.8.2). From pre-colonial to post-colonial Uganda, cultural norms have been pivotal in shaping gender relations (Messerschmidt, 2024; Rietveld, Ajambo and Kikulwe, 2016). Traditionally, the clan through clan leaders who serve as custodians of cultural norms, provide unwritten guidelines on relationships among household members such as men, women and

children (CCFU, 2013; Sørensen, 1996). However, the extent to which the clan formally becomes involved in intra-household gender relations in post-colonial Uganda has been moderated by statutory legislation and policy reforms discussed further in this section (Kemigisha, 2021; Musisi, 2019; Sseremba, 2024; Watson, Kyomuhendo and Ghimire, 2020). The patriarchal system in Uganda and its effects on intra-household gender relations is similar to that of other societies in Africa where men are traditionally regarded as household heads, own and control critical resources such as land and dominate decision-making (Ampaire *et al.*, 2017; Kibanja and Munene, 2015; Osunsan, 2015; Lorist, Mbabazi and Moyer, 2022; Lundgren *et al.*, 2019; Theeuwes *et al.*, 2021).

In pre-colonial Uganda, intra-household gender relations are noted to have been relatively less rigid and equitable in relation to resources such as land and agricultural produce, responsibilities and decision-making power (Kemigisha, 2021; Musisi, 2019). Due to communal ownership of land guided by customary rules, women farmers had adequate access to land for agriculture, they determined which land to farm, what and when to cultivate (Kemigisha, 2021; Mabikke, 2016; Sørensen, 1996). For instance, 'a woman's capacity to clear more virgin land' for farming determined the size of land that she cultivated (Kemigisha, 2021, p.117). Besides that, some men are also noted to have practiced subsistence farming alongside women farmers despite selling agricultural surplus (De Haas, 2014). But this changed during the colonial period (1894-1962).

The colonial era ushered in shifts in intra-household gender relations through monetisation of agriculture and changes in the land tenure system. These changes relate to the effects of the cash-crop revolution discussed previously (cf. section 2.1).

Colonialism significantly shifted land uses from subsistence to commercial farming in pursuit of capitalist agendas and at the expense of local farmers such as women (Haas, 2021; Jørgensen, 2023; Roessler *et al.*, 2022). This was evidenced through male farmers adopting cultivation of traditional cash crops such as coffee and cotton and women farming subsistence crops even though females weeded both cash and subsistence crops (Kemigisha, 2021; Sørensen, 1996). This altered women's land access rights as men took charge of the land and made decisions about where women should cultivate in order to reserve adequate land for themselves to cultivate cash crops (Kemigisha, 2021). The monetisation of agriculture also conjured the need for changes in land access and ownership rights from communal to individual (Bazaara, 1994; Mabikke, 2016; Kemigisha, 2021). Therefore, land access and ownership rights were formalised through leasehold, freehold, mailo (the king of Buganda kingdom is the landlord and the occupants are tenants) and crown land tenure systems regulated by crown land ordinance 1903, registration of land titles ordinance 1908 and Busuulu and Envujjo law 1928 (Coldham, 2000; Kemigisha, 2021; Mabikke, 2016). These changes made gender disparities in intra-household gender relations more visible in the colonial period than in the pre-colonial period.

Disparities in intra-household gender relations have persisted and become more pronounced from the time Uganda gained independence in 1962 (the post-colonial period). Gender variations in access and control over critical resources such as land relates to the prominence of customary land which was formalised through the Land Reform Decree of 1975 (Coldham, 2000; Sørensen, 1996). Access and ownership of customary land is guided by customary rules which upholds inheritance of land through patrilineal lineage and restricts ownership and control to men (Coldham, 2000; Watson, Kyomuhendo and Ghimire, 2020). This means that the right to determine how

customary land is utilised is largely demarcated to the men. Besides land, the monetisation of agriculture contributed to shifts from men only cultivating traditional cash crops such as cotton and coffee to cultivating traditional food crops such as maize, cassava and bananas for cash (Bazaara, 1994; Joughin and Kjær, 2010; NPA, 2013; Sørensen, 1996).

The expansion of cash-crop farming further increased men's interest and power to control land in comparison to the pre-colonial era (Coldham, 2000; Kemigisha, 2021). In terms of division of gender roles, there has been additional burden because women not only focus on farming for subsistence where they undertake most of the agricultural activities but also weed crops cultivated by men for cash (Lastarria-Cornhiel, 2008; Sørensen, 1996). This represents disproportionate division of agricultural activities observed as a common manifestation of gender inequalities in Africa (Abass *et al.*, 2018; Balgah, Amungwa and Egwu, 2019; Farnworth *et al.*, 2023; Rao *et al.*, 2020). In response, the Government of Uganda and development partners such as United Nations and World Bank have dedicated efforts and are still working towards addressing gender relations concerns. These efforts have been undertaken through reformation and development of gender sensitive legislation, policies, programmes and projects as well as ratifying international commitments such as SDGs (UBOS, 2016; UNDP, 2022). With the enactment of the 1995 constitution of Uganda widely described as gender-sensitive, women are stated to have been empowered to advance their concerns (UNDP, 2022; Watson, Kyomuhendo and Ghimire, 2020). Legislation, policies and plans such as the Land Act, Succession Act, gender equality strategies, national gender policy and the policy on elimination of gender-based violence among other policies have been at the forefront of advancing gender equity

and women's empowerment (Ashukem, 2020; Coldham, 2000; Kemigisha, 2021; UNDP, 2022; Watson, Kyomuhendo and Ghimire, 2020).

Additionally, gender concerns have been mainstreamed in government programmes and projects such as those that focus on agriculture and adaptation to climate change (Acosta *et al.*, 2019; MAAIF, 2020). The above interventions have been useful in addressing gender disparities, however not much progress has been achieved with respect to intra-household gender relations. Gender relations including relationships between household members in Uganda are described as 'highly unequal by any standard measure' (Durairaj *et al.*, 2019; Pankhurst, 2002, p.5; Theeuwien *et al.*, 2021, UNDP, 2022). Women are observed to have been marginalised and socially positioned as subordinate to men (Kibanja and Munene, 2015; Osunsan, 2015). These gender asymmetries undermine the abilities of women to autonomously make livelihood related decisions such as how to adapt to climate change (Ampaire *et al.*, 2020; Busagwa, 2019). Climate change and adaptation are explored in the next section.

2.3 Climate change and adaptation in Uganda

Uganda has historically been characterised by a relatively stable climate evidenced through minimal variations in rainfall patterns (Kavuma, 2024). However since the 19th century, the climate is noted to have been changing. The changes in the climate have been attributed to a reduction in the forests and woodlands and private land ownership formalised during the colonial era thus giving landowners the liberty to engage in different land uses that even jeopardises the environment among other global factors such as greenhouse emissions, industrialisation and burning of fossil fuels (Banana *et al.*, 2014; Crowley, 2000; Hegerl *et al.*, 2019). This means that climate change is not

a recent environmental problem in Uganda but rather a problem that has persisted and deteriorated over time. In the pre and early post-colonial period, climate change was less severe and farmers adapted to adverse effects of climate change such as drought and floods through measures such as migration, diviners making rain, harvesting wild fruits, fishing, early planting, intercropping, crop rotation, digging trenches and shifting cultivation (Bernard *et al.*, 2019; Egeru, 2012; Jørgensen, 2023; Orlove *et al.*, 2010). However the severity of climate change and its adverse effects in the recent decades continues to raise concerns about climate adaptation in Uganda.

Uganda's climate is apparently described as variable with changes majorly manifesting in terms of variation in rainfall patterns and temperature and their resultant effects such as floods, prolonged dry spells, drought, mudslides and landslides (MWE, 2015; Nsubuga and Rautenbach, 2018). From the 1960s, floods and droughts have been negatively impacting livelihoods in Uganda. But these experiences have been more severe in the last two decades. Floods and drought related disasters have caused death, loss of property and human displacement (IMF, 2022; MWE, 2015; Oriangi *et al.*, 2024). In the northeastern region, seven droughts were experienced between 1991 and 2000. Additionally, major droughts also occurred across the country in 2001, 2002, 2005 and 2008 (Irish Aid, 2017; MWE, 2015).

With respect to floods, frequent and intense occurrences have been experienced. In 2008, floods sub-merged and destroyed 70 percent of crops in Eastern Uganda (URCS, 2008). Still in the same region, 850 people were displaced and 51 lives were lost due to mudslides which occurred in 2018 in Bududa district (Serwajja, Kisira and Bamutaze, 2024). In 2019, mudslides again occurred in eastern Uganda displacing 200 households while leaving 47 people dead (Daily Monitor, 2019; Serwajja, Kisira

and Bamutaze, 2024). Similarly, landslides were experienced in Kween district in 2020 when rivers Kere and Sundet burst their banks leaving many homeless, destroying crops and animals (Daily Monitor, 2019). Likewise, in the western and northern regions, floods displaced thousands of people, submerged hundreds of acres of gardens and caused loss of lives in 2020 and 2021 (Davies, 2021; Olukya, 2021; Serwajja, Kisira and Bamutaze, 2024). Most recently, floods and landslides were experienced in the mountainous regions of eastern and western Uganda in 2022 and 2023. In the east, districts that are situated on the slopes of mount Elgon whilst in the west districts that are located on the slopes of mount Ruwenzori were adversely affected by floods and mudslides that caused loss of lives, submerged houses, crops and displaced people (Davies, 2022; *ReliefWeb*, 2023; URCS, 2023). These changes are noted to severely impact women farmers in comparison to the men (Atube *et al.*, 2021; Finland *et al.*, 2022). These variations in the effect of climate change on female and male farmers in Uganda are also noted to construct women's vulnerability to climate change in most countries in Africa (Aryal *et al.*, 2022 Bikketi *et al.*, 2016; Farnworth *et al.*, 2023).

Besides the above manifestation of climate change, there are projections about future changes in the climate in Uganda. For instance, the maximum temperature is projected to rise by between 1°C and 2.2°C and minimum temperature by between 0.8°C and 2.5°C by 2050 (IPCC, 2014). Changes in rainfall patterns are also projected to persist with decreasing rainfall in some areas such as the northeastern region and increasing in certain areas such as the southwestern region (Lwasa, 2018; MWE, 2020; Nalwanga *et al.*, 2024; UNMA 2020). The anticipated persistent changes in rainfall patterns denote future severity and frequency of floods and droughts in Uganda and across Africa (IPCC, 2021; UNFCCC, 2020; WMO, 2020). Since Uganda's largest

population most especially women practice rain-fed smallholder agriculture as a major source of livelihood (cf. section 2.1), present and future changes in the climate signify women's difficulty in the realisation of food security, improved income levels and wellbeing (Bagamba *et al.*, 2012; Gebrechorkos *et al.*, 2023; MWE, 2015; Mubiru *et al.*, 2012). This demonstrates Uganda's vulnerability to climate threats and the significance of robust and gender-sensitive adaptation approaches (Crawford, Echeverría and Terton, 2016; MWE, 2020; ND-GAIN Index, 2019; Twinomuhangi, Sseviiri and Kato, 2023). It further underpins the significance of women's decisions to utilise diverse adaptation strategies to alleviate the negative effects of climate change.

Due to the risks that climate change imposes on livelihoods and national development, the Government of Uganda has dedicated efforts to address climate threats. Through support from regional and international development partners, the government addresses climate change by enhancing climate adaptation among other intervention measures. This has been undertaken through the National Climate Change Policy (2015), National Adaptation Plan (2023) and the integration of climate concerns in National Development Plans and other country level development programmes and projects (Crawford, Echeverría and Terton, 2016; MWE, 2020; UNEP, 2023). For instance, agricultural programmes such as those that provide agricultural extension services discussed previously also equip farmers with climate adaptation knowledge, skills and agricultural inputs (cf. section 2.1). Mainstreaming climate adaptation in agricultural programmes signify that rarely do climate adaptation initiatives specifically target addressing climate adaptation concerns of women farmers such as resource constraints (Ampaire *et al.*, 2017).

In line with regional and international climate response commitments, the government enacted Climate Adaptation Act 2021 to guide the achievement and operationalisation of conventions such as the Nairobi declaration on climate change 2023, UNFCCC, Kyoto protocol, Paris Agreement and SDGs 3 (AU, 2023; UNEP, 2023; World Bank, 2019). Additionally, Uganda just as other African countries developed its Nationally Determined Contribution Partnership Plan (NDC-PP) in 2018 in line with the agreements of UNFCCC (MWE, 2022; World Bank, 2019). These interventions have contributed some improvements in climate adaptation in that farmers utilise strategies similar to those used in the early post-colonial period such as crop rotation, altering planting dates, digging trenches alongside modern strategies such as improved seeds, fertilizers and pesticides (Bomuhangi *et al.*, 2016; Jost *et al.*, 2016). But smallholder women farmers still experience hinderances in deciding how to moderate the risks of climate change (Kristjanson *et al.*, 2015; Marilia *et al.*, 2023). The adaptation difficulties of women have been linked to less gender-sensitive climate adaptation policies, limited involvement of local women farmers in policy designs, resource limitations and gaps between climate adaptation policies and programmes and practice (Ampaire *et al.*, 2020; Ampaire *et al.*, 2017; Sanya *et al.*, 2023). The impediments that smallholder women farmers experience in adaptation decision-making jeopardises their ability to adapt to climate change and imposes critical implications on their livelihoods.

2.4 Conclusion

The evidence in this Chapter demonstrates change and deterioration in intra-household gender relations and the climate in Uganda. Intra-household gender relations are largely earmarked with inequities and climate change impose devastating effects on the livelihoods of smallholder farmers who are mostly women. Institutions

have been adopted to address risks associated with gender disparities in intra-household relations and climate change. But gender inequities still persist and women struggle to moderate the negative effects of climate change due to factors such as gaps in policy and programme development and implementation and the influences of cultural norms. These gaps portend that institutions can enable or constrain climate adaptation decisions of women farmers. This Chapter foreshadows the linkage between gendered institutions, intra-household gender relations and climate adaptation decisions. To understand this connection, my study questions how the interactions of gendered institutions with each other and with intra-household gender relations configure adaptation decisions of women farmers.

CHAPTER THREE: LITERATURE REVIEW

3.0 Introduction

In this Chapter, I review literature to gain foundational and contextual insights in connection to gender relations, climate change adaptation decisions and the interactions of gendered institutions. The insights that I gain inform the theoretical choice, designing of the conceptual framework, methodological approach and analysis of data. This Chapter discusses literature in relation to gender and climate change experiences, climate change adaptation strategies, the dynamics of women's adaptation decision-making in households, interactions of gendered institutions and the theoretical underpinning of this research.

This Chapter is organised in five sections. Section 3.1 focuses on literature on gender and climate change experiences and adaptation in the context of smallholder agriculture. In these discussions, concepts of gender, smallholder agriculture and climate change adaptation are also explained. In section 3.2, I concentrate on intra-household gender relations and adaptation decision-making. This section explores resources, responsibilities and power dynamics that women farmers navigate in adaptation decision-making. In section 3.3, discussions focus on the interactions of gendered institutions, their interconnections with intra-household gender relations and women's adaptation decisions. To provide a foundation for the ensuing discussions within this section, I commence with reviewing literature on the concept of institutions and gendered institutions. It is based on this that the usage of the terms 'institution' and 'gendered institution' is defined in my thesis. After this, I proceed to review literature in relation to the interactions of gendered institutions and their linkages to women's adaptation decisions.

Informed by literature review in the previous sections (cf. section 3.1, 3.2, 3.3), section 3.4 reviews literature on FPE and SRA as theories to guide analysis of the interactions of gendered institutions, their interlinkage with gender relations and adaptation decisions of women farmers. The literature review with respect to FPE centres on perspectives about the interconnection between formal and informal institutions and gender resource access and control, responsibilities and power. The literature review in relation to SRA focuses on the interaction of institutions with each other and their interlinkage with gender relations. Moreover, discussions in this section also shows the application of FPE and SRA in previous studies, their strengths and critiques in guiding research analysis. Guided by the literature, FPE and SRA theoretical perspectives, I design a conceptual framework to research design, data collection and analysis which I discuss after the theoretical underpinnings. In section 3.5, I provide the Chapter conclusion which highlights the major issues discussed whilst disclosing the main gaps in the literature in the context of my research.

3.1 Gender and climate change adaptation in smallholder agriculture

This section reviews literature on the concept of gender and its relations, gender and climate change experiences and adaptation in smallholder agriculture.

3.1.1 Conceptualising gender and its relations

Gender is conceptualised based on its relational, hierarchal, contextual, historical and institutional dimensions. In line with these dimensions, gender is described as a social variable that is shaped by and also shapes human interactions and relations (Connell, 2009). It is further stated to shape relationships in the sense that it constructs power dynamics and norms that configure relationships across different cultural and societal contexts (Connell, 2009; Kenny, 2007; Lindqvist, Sendén and Renström, 2021;

Twyman *et al.*, 2014). This interpretation of gender forms the basis upon which some studies question how best to analyse gender in order to gain in-depth grasp of its functionality and resultant effects in connection with the above aspects (e.g. Kenny, 2007; Lindqvist, Sendén and Renström, 2021). For instance, previous studies criticise the binary approach of examining gender on the basis of relationships between ‘females’ and ‘males’. It is asserted that this binary approach neglects other gender identities and social variables that shape gender power relations (Anyidoho, 2020; Kenny, 2007; Lowndes, 2020; West and Zimmerman, 2009). To remedy the above drawbacks, previous studies emphasise assessing gender beyond the binary approach in correspondence with the interpretation of gender as something that people ‘do’ other than what they ‘have’ (Kenny, 2007; Lowndes, 2020; West and Zimmerman, 2009). The interpretation of gender as something that people do signifies that gender interrelates with other social variables such as culture, ethnicity and race and constructs social relations in different institutional spaces where women undertake daily activities such as households.

In other related studies, gender is observed to interlink with the broader political economy such as institutions that construct gender positionalities, subjectivities and power hierarchies (Carr and Thompson, 2014; Kenny, 2013; Thompson, 2021). These relationships shape climate actions, access to natural resources and collaborations between social groups to enhance climate adaptation (Lawson, 2020; Nunan, Hara and Onyango, 2015; Owusu and Yiridomoh, 2021). These perspectives illustrate that gender as a social construct and through its relationships with other social variables also impact men’s and women’s relationships and climate adaptation. Therefore, even though the examination of gender relations on the basis of women’s and men’s relationships is criticised, this analysis can still be useful depending on the study focus

and context (Shai, Koffler and Hashiloni-Dolev, 2021). Its relevance can be enhanced through paying attention to other social variables that interplay with gender to configure relationships between women and men as observed above (e.g. Anyidoho, 2020; Lowndes, 2020). Drawing from the perspective of gender as ‘doing’, I conceptualise gender as a social variable that interrelates with other social variables to construct and reconstruct power relations that shape social relations in households. These power relations are conceived as ‘gender relations’ that function in different institutional sites such as households and communities and configure climate change experiences and adaptation of smallholder women farmers. Gender and climate change experiences and adaptation is explored in the subsequent section.

3.1.2 Gender and climate change experiences in smallholder agriculture

The majority of global agricultural practices that sustain food production are undertaken on small pieces of land that are less than two or not more than 200 hectares (Chamberlin, 2008; Cohn *et al.*, 2017). This demonstrates the centrality of smallholder farming in advancing food security and people’s wellbeing. However, smallholder farming is predominantly practiced by women who mostly depend on rainfall and struggle to adapt to climate change due to limited access to resources (Jost *et al.*, 2016; Owusu and Yiridomoh, 2021; Rapsomanikis, 2015). The inability of women to alleviate the negative effects of climate change raises concerns about how they enhance agricultural production, their survival and that of their household members. This observation does not undermine the ability of women to safeguard their livelihoods but rather draws attention to the hardships which women endure.

Changes in the climate are documented in previous studies and noted to manifest through variations in rainfall patterns, rising temperatures, floods, droughts, cold and

heat waves, cyclones and hurricanes, wildfires and sea level rise (Assan *et al.*, 2018; Awiti, 2022; Dankelman, 2010; Denton, 2002; Ngigi, Mueller and Birner, 2017; Nelson and Stathers, 2009; Sugden *et al.*, 2014). In most parts of Africa, late onset and early cessation of the rainy seasons, decreased rainfall quantities, prolonged dry spells, drought and flood conditions are stated to significantly impact smallholder agricultural production (Awiti, 2022; Bedeke, 2023; Owusu and Waylen, 2013). In East and West Africa, the most common manifestations of climate change are drought, floods and storms (Ackerl. 2023; Twyman *et al.*, 2014). These climatic events are experienced by the majority of smallholder farmers irrespective of their gender due to dependence on natural resources such as rainfall to rear animals and cultivate crops (Wrigley-Asante *et al.*, 2019). But this does not infer gender neutrality in the climate change experiences of smallholder farmers.

Gender contrasts in the climate change experiences of female and male farmers are noted in the literature and are associated with gender disparities in climate vulnerabilities. In this regard, the adverse effects of climate events are observed as more widespread among females compared to the males (Assefa and Gebrehiwot, 2023; Wrigley-Asante *et al.*, 2019). Women are recognised as the most impacted by the effects of climate events such as water scarcity, food insecurity, low agricultural outputs, crop failure and their consequential impacts on income levels and asset base in comparison to the men (Aryal *et al.*, 2022; Bob and Babugura, 2014; Kristjanson *et al.*, 2017; Rao *et al.*, 2019). In seasons of drought and floods, women's income levels and food security are described as severely affected because of restricted mobility which undermines their ability to search for other jobs to boost their income levels like men (Rao *et al.*, 2019). These differing levels of climate severity distinctively configure the climate experiences of female and male smallholder farmers. However, this does

not universalise the common discourses that present women as ‘victims’ or ‘saviours’ of climate change nor does it essentialise differences in the climate experiences of women and men farmers. In some studies, perspectives that homogenise women’s vulnerabilities to climate change and presents women as environmental saviours are criticised. It is asserted that such discourses deflect focus from the production and reproduction of power relations and imbalances by institutional arrangements as well as women’s agency in alleviating the adverse effects of climate change on their survival (Arora-Jonsson, 2011; Rao *et al.*, 2019). Agency is interpreted as ‘the power within’ which persuades women to define goals and actions (Ademiluka, 2018; Kabeer, 2000; Kabeer, 1999. p.438; Kawarazuka, Locke and Seeley, 2019).

In certain contexts, the climate experiences of women and men vary among different females and males while there are also instances when smallholder farmers share similar experiences across gender lines. These variations are widely attributed to the intersecting influences of resource base, education, age, marital status and family size (Alare *et al.*, 2022; Deressa *et al.*, 2009; Mwangi *et al.*, 2015; Owusu and Yiridomoh, 2021). In the context of resources, poor women are stated to be severely impacted by climate effects compared to wealthier women in a similar way as poor men are adversely affected by climate events than wealthy men (Arora-Jonsson, 2011; Carr and Thompson, 2014). Therefore, the severity with which climate change impacts males and females constructs similar or different climate experiences. This raises concerns about universalising women’s climate experiences. The recognition of gender variations in climate experiences draw attention to the intersectional framing of gender subjectivities by power structures and their configuration of climate realities in broader institutional spaces (Hackfort and Burchardt, 2018; Sugden *et al.*, 2014;

Thompson, 2021). This means that the climate experiences of smallholder farmers can be shaped through an interplay of factors.

Studies that emphasise women's adverse experiences with climate change attribute such experiences to the effects of socio-economic factors such as traditional norms, resource limitations, high dependency on natural resources and inadequacies in delivery of agricultural extension services (Assefa and Gebrehiwot, 2023; Garcia, Tschakert and Karikari, 2020; Morton, 2017; Niemann *et al.*, 2023; Singh, Dorward and Osbahr, 2016). Moreover, institutions such as state rules and regulations and customary laws are specifically asserted to impact women's climate experiences (Abid *et al.*, 2016; Ngigi, Mueller and Birner, 2017; Owusu and Yiridomoh, 2021). In a study that investigated gender disparities in climate change perceptions, awareness and adaptation in Africa, variations in the lived climate realities of female and male farmers are disclosed according to climate events (Twyman *et al.*, 2014). Women in West Africa are stated to have been severely affected by floods and storms whereas the men are majorly impacted by drought and erratic rainfall. In East Africa, women are noted to suffer more from drought compared to the men who are mostly affected by storms (Twyman *et al.*, 2014). This variation in climate realities corresponds with traditional gender roles and responsibilities in that women's adverse experiences with drought and floods is attributed to their responsibility of fetching water and cultivating vegetables to feed the family whereas men's experience with storms relates to farming of crops for commercial purposes (Ackerl *et al.*, 2023; Kyazze and Kristjanson, 2011; Ngigi, Mueller and Birner, 2017). Women's varied experiences with drought is further associated with the difficulties that women face in feeding the family during seasons of drought when food scarcity is mostly prevalent (Djouidi and Brockhaus, 2011). From

these observations, the interconnections between gender responsibilities, women's climate experiences and cultural norms are revealed.

There is a general recognition of the interconnection between institutions and women's climate experiences even in studies that inadequately undertake in-depth examination of institutions. Formal institutions are noted to improve women's access to agricultural training and climate information whilst informal institutions such as customary rules are observed to hinder women's resource access and control (Assefa and Gebrehiwot, 2023; Niemann *et al.*, 2023). This implies that institutions shape women's climate experiences through enabling or undermining their capacity to adapt to climate change. In acknowledgement of institutions as an integral part of gendered climate experiences, climate threats and vulnerabilities are interpreted as 'complex, interconnected and integrated' (Ackerl *et al.*, 2024, p. 192). This underpins complexity and interconnectedness in the different practices that configure and reconfigure women's climate experiences and adaptation. These practices include interface with rules and regulations that are part of women's everyday lives. Further, these practices also manifest in relations that pertain to resources, responsibilities and power within and among household members referred to as 'intra-household gender relations' in this thesis (Ngigi, Mueller and Birner, 2017; Tambulasi, Mkwambisi and Kamoto, 2021). In order to gain insights about these relationships, I review literature on gender and climate change adaptation in the next section.

3.1.3 Gender and climate change adaptation

Adaptation to climate change plays a crucial role in improving agricultural productivity amidst climate vagaries that undermine people's survival. In most of the literature, adaptation to climate change is described as adjustments that people make in

response to the actual or anticipated change in the climate (IPCC, 2022; Khan & Roberts, 2013; Parry *et al.*, 2007; UNDP, 2024). This interpretation proposes that the strategies that people employ to moderate the negative effects of change in the climate are predominantly in response to climate change. The description of adaptation as response to changes in the climate are questioned in some studies. The questions raised relate to whether people adapt to climate change, livelihood struggles or both (Nyahunda and Tirivangasi, 2022; Smit *et al.*, 2000). In line with these concerns, some studies demonstrate that climate adaptation and sustainable livelihood practices are interwoven and that climate adaptation can be integrated with development planning (Lemos *et al.*, 2007; Nyahunda and Tirivangasi, 2022). Based on these arguments, it can be inferred that climate adaptation may not always be in response to climate change but to livelihood difficulties. These perspectives about the understanding of climate change adaptation do not downplay its significance in moderating the adverse effects of climate change in smallholder agriculture. Informed by the above interpretations, this thesis perceives adaptation to climate change as adjustments undertaken to moderate the actual and likely harm of climate change.

Smallholder farmers employ different forms of adaptation measures in response to climate change. The common adaptation categories are on-farm and off-farm. On-farm strategies are adjustments and changes in farm management and cropping practices whilst off-farm strategies are livelihood activities adopted aside from farming (Adger *et al.*, 2003; Gordon, Odame and Victor, 2019). These adjustments, on-farm and off-farm, are undertaken with the aim of moderating the risks of climate change. On-farm measures include changing planting and harvesting dates, crop diversification, agroforestry, irrigation, contour farming, mixed crop-livestock farming, intercropping, local compost, crop rotation, changing crop varieties, livestock sale, and

use of fertilizers and pesticide whereas off-farm strategies involves membership in informal groups, petty trade and migration among others (Adzawla *et al.*, 2019; Ali, Awade and Abdoulaye, 2020; Apraku, Morton and Apraku-Gyampoh, 2021; Aryal *et al.*, 2020; Bryan *et al.*, 2009; Deressa *et al.*, 2009; Nyberg *et al.*, 2021; Twyman *et al.*, 2014). Although male and female smallholder farmers have access to both on-farm and off-farm strategies, existing literature reveals discernible commonalities and differences in adaptation practices of female and male smallholder farmers.

Within the context of smallholder farming, some adaptation measures have been found to be utilised by both female and male farmers. Commonalities are evidenced with regards to women's and men's decisions to adopt on-farm crop and livestock adaptation practices such as changing crop varieties, expanding farmland, irrigation and agroforestry (Ngigi, Mueller and Birner, 2017). In consonance with adaptation commonalities, adjusting planting dates, row planting, mixed farming, intercropping, planting early and drought tolerant crops are noted to have been utilised by both female and male farmers (Adzawla *et al.*, 2019). These gender similarities in adaptation strategies applied by small-scale farmers illustrate differing climate adaptation circumstances encountered by women farmers, with certain women possessing better resource access relative to others (Arora-Jonsson, 2011; Carr and Thompson, 2014; Rao *et al.*, 2019).

Moreover, off-farm methods such as membership in social groups are also recognised to have been utilised by male and female farmers (Ngigi, Mueller and Birner, 2017). Even though this evidence contradicts the observation that membership in social groups in response to climate change is predominant among women farmers (e.g. Assan *et al.*, 2018; Lawson *et al.*, 2020), it raises concerns about the type of groups

to which women and men belong and the nature of their involvement. However, such contradiction highlights the relevance of scrutinising climate adaptation in detail to unravel the specific areas within which commonalities and contrasts in adaptation responses exist. Besides that, it also signifies the likelihood of gender variations in adaptation being evidenced in other aspects beyond the adoption of specific measures.

In differing scholarship on gender variations in climate response, differences in the climate change adaptation practices of female and male smallholder farmers are observed. In many rural areas of Africa, on-farm adaptation strategies such as the adoption of improved seed varieties, fertilizers, intercropping, terracing, contour ploughing and grass planting are observed to be more prevalent among farms headed by males compared to those exclusively managed by females (Ackerl *et al.*, 2023; Teklewold, Bezabih and Gebrehiwot, 2022). To modulate climate induced financial stress, female farmers in West Africa tend to rely on off-farm adaptation strategies such as obtaining credit from village savings and loan associations while males predominantly depend on on-farm practices such as selling livestock (Assan *et al.*, 2018; Lawson *et al.*, 2020). Borrowing from informal savings and credit groups is recognised as one of the most popular climate coping strategies among women in comparison to the male farmers (Lawson *et al.*, 2020; Nyberg *et al.*, 2021; Van Aelst and Holvoet, 2016). This underscores the importance of a contextually nuanced understanding of gendered climate adaptation because women's dependence on informal borrowing can be intricately linked to their distinct financial circumstances.

More evidence of gender differences in climate adaptation is observed in Ghana. On-farm adaptation measures such as early planting is commonly practiced by males

whilst early harvesting and intercropping is predominately employed by females (Wrigley-Asante *et al.*, 2019). In Tanzania, women undertake casual work in grain mills alongside cultivating cover crops and drought resistant crops for food whilst men farm short-term maturing vegetables such as egg plants, tomatoes and cabbages mainly for commercial purposes (Van Aelst and Holvoet, 2018; Zakayo *et al.*, 2021). The engagement of men in commercial vegetable cultivation and women's focus on food provision reveals the constraining effects of traditional gender roles on the capacities of women to adapt to climate change (Aryal *et al.*, 2020). Women's concentration on addressing their role of food provision not only affects their attainment of financial autonomy but also hampers their adoption of a broader range of adaptation strategies.

Further gender disparities are disclosed in the adoption of migration in response to extreme climate events. Men are noted to migrate more than women due to climate vagaries in most parts of rural Africa (Lawson *et al.*, 2020; Rao *et al.*, 2019). Women's barriers in utilising migration are associated with cultural norms that regard women as home carers and restrict their mobility (Assefa and Gebrehiwot, 2023; Kyazze and Kristjanson, 2011). In certain rural communities such as in Ethiopia, women's migration in response to adverse climate impacts is socially unacceptable (Assefa and Gebrehiwot, 2023). This highlights how cultural norms contribute to divergent application of on-farm and off-farm adaptation strategies along gender lines.

Gender disparities in livestock adaptation practices are also revealed. Husbands are noted to change feeding practices of livestock, breeds and reduce the number of livestock in contrast to wives who rear small ruminants and other non-ruminant animals like pigs and poultry in rural Kenya (Ngigi, Mueller and Birner, 2017). This variance links to men's overall ownership and control over large livestock due to their

high economic value (Tambulasi, Mkwambisi and Kamoto, 2021). In Malawi and Zambia, it is stated that divorced women commonly own small livestock because while in marriage large livestock belong to the male household heads (Khoza, Van Niekerk and Nemaikonde, 2019). In other studies, gender disparities in climate response are noted with regards to adaptation intensity. Male farmers commonly demonstrate higher capacity to employ a combination of adaptation measures compared to their female counterparts (Ackerl *et al.*, 2023; Adzawla *et al.*, 2019; Belay *et al.*, 2017). Additionally, gender differences are revealed in rates of, and the extent to which, adaptation measures are implemented. In line with this, men are stated to possess greater capacity to effectively utilise a range of strategies within the right timing and intensities such as adjusting planting dates, being able to irrigate crops and practicing seasonal migration (Assefa and Gebrehiwot, 2023). The presence of gender variations in adaptation to climate change even in situations where homogeneities exist (e.g. Adzawla *et al.*, 2019), disclose intricate asymmetries in the adaptation capacities of female and male smallholder farmers.

In most of the literature, gender contrasts and similarities in climate change adaptation is attributed to gender inequities in resource rights, responsibilities, and power relations (e.g. Assefa and Gebrehiwot, 2023; Jost *et al.*, 2016; Lawson *et al.*, 2020; Wrigley-Asante *et al.*, 2019). There is also a recognition of the implications that the intersection between gender and other social variables such as culture, class, ethnicity, marital status and institutions pose on women's climate adaptation (Mersha & Van Laerhoven, 2016; Ngigi, Mueller, & Birner, 2017; Sugden *et al.*, 2014; Van Aelst and Holvoet, 2018). This evidence directs attention to the gendered resources, responsibilities and power relations intricacies that women navigate in adaptation decision-making at household level explored in the next section (3.2).

3.2 Intra-household gender dynamics and adaptation decision-making

Scholarship recognises the connection between resources, responsibilities and power dynamics and women's adaptation decisions. This has been partially highlighted in the previous section (cf. section, 3.1). This section builds on earlier discussions and incorporates new perspectives. Much as I have classified the gender issues that women farmers confront in adaptation decision-making, I am cognisant that their effects overlap each other. This overlap is illustrated in the way scholars have prominently utilised a crosscutting approach that collaboratively discusses and unravels the synergistic effects of resources, responsibilities and power relations on the adaptation decisions of smallholder women farmers (Assefa and Gebrehiwot, 2023; Diarra *et al.*, 2021). But still, each of these aspects, resources, responsibilities and power relations are distinct and play a critical role in shaping adaptation decisions. Therefore, classifying and discussing these aspects as independent categories permit rational and heuristic exploration of how climate decisions are constructed (Biesbroek *et al.*, 2013; Jones, 2000). Since adaptation to climate change is seen as 'part of the dynamics of society' (Eriksen, Nightingale and Eakin, 2015, p. 524), it can be asserted that adaptation decisions entwine with societal normative practices which permeate all aspects of life. This corresponds with the arguments in the previous section about the connections between cultural norms and climate adaptation decisions (cf. section 3.1).

This section examines intra-household gender relations that women navigate in adaptation decision-making. The section also pays attention to the interconnections between gender relations and institutions as well as their implications on women's adaptation. This examination is undertaken by evaluating the relationships between men, women and other household members with respect to resources, responsibilities

and power herein referred to as 'intra-household' gender relations. It also pays attention to the linkages between intra-household gender relations and formal and informal institutions. This is useful in gaining nuanced understanding of the construction and reconstruction of gender relations and its influences on women's adaptation decisions (Zingwe, Manja and Chirwa, 2023). It also provides comprehensive and context-specific diagnosis of the configuration of women's adaptation decisions in a domestic context where gender and institutions interconnect in their totality.

3.2.1 Resource access and control dynamics

When deciding how to adapt to climate change, women farmers navigate resource access and control issues in households and other workspaces such as the community. These resources are material and non-material such as land, finances, livestock, farm inputs and implements, knowledge and skills, information and social groups and networks (Alare *et al.*, 2022; Backhouse and Medema, 2009; Ngigi, Mueller and Birner, 2017). The ability of women farmers to decide and negotiate adaptation decisions are associated with gendered resource access and control with women observed to experience disparities in resource rights (Anaglo, Boateng and Boateng, 2014; Badstue *et al.*, 2020; Deschênes, Dumas and Lambert, 2020; Nyantakyi-Frimpong, 2019). In the majority of studies, gender inequalities in resource access are linked to socio-cultural constraints such as cultural norms and institutional pitfalls in the delivery of agricultural extension services and adaptation programmes and policies (Alston, 2013; Ampaire *et al.*, 2020; Arora *et al.*, 2017; Garcia, Tschakert and Karikari, 2020; Lawson *et al.*, 2020). For instance, even though the influences of access to early floods and drought warnings on adaptation decisions is acknowledged, limited access to such information among women is prevalent across rural Africa

(Aryal *et al.*, 2022; Assefa and Gebrehiwot, 2023; Belay *et al.*, 2017). This questions the pathways through which women gain access and control over resources and the relationships between these pathways and gender resource asymmetries.

There are different pathways through which women gain access to and control over resources that may contribute to gender resource symmetries and asymmetries. These are through formal resource rights constructed by existing laws and policies and informal resource rights determined by societal normative aspects such as traditional norms, customs, beliefs and value systems (Alare *et al.*, 2022; Assan *et al.*, 2018; Lawson *et al.*, 2020). The linkages between formal resource rights and resource access symmetries are demonstrated through improvement in women's inheritance, purchase or hire of land, formation and participation in groups and associations, access to agricultural training and climate information. In some African countries, the legal framework that guides possession and dispossession of land and other assets such as livestock enhances women's access to resources through inheritance, purchase or hire (Awiti, 2022; Doss *et al.*, 2018; Lawson *et al.*, 2020). In Rwanda, the improvement in access to land by legally married women and their implementation of soil conservation practices are linked to formal land laws and policies (Ali, Deininger and Goldstein, 2014). Similar results on women's improved land access in Madagascar reveals that land laws strengthened women's claim over individually owned land (Widman, 2014).

With respect to social groups, climate training and information, some female farmers are observed to receive support from formal institutional arrangements to enhance climate response despite prevailing gaps in extension service delivery (Otieno *et al.*, 2021; Khoza, Van Niekerk and Nemaconde, 2019). Social groups are also argued to

facilitate women's access to climate trainings and information provided by the state, non-governmental organisations and financial agencies (Ngigi, Mueller and Birner, 2017). Much as women's access and control over resources through formal resource rights leverage gender gaps, gender resource inequities may persist. Scholarship attributes persistent gender resource inequities to implementation gaps in state policies, programmes and regulations and the drawbacks of informal resource rights such as customary rules (Ampaire *et al.*, 2017; Bikketi *et al.*, 2016; Khoza, Van Niekerk and Nemaikonde, 2019; Kristjanson *et al.*, 2017). This raises concern about the extent to which formal resource rights such as laws and policies address gender resource asymmetries.

Informal resource rights guided by customary rules and regulations is the most common among smallholder women farmers. In this form of resource access, gender resource asymmetries are pronounced because women's access and control over resources is guided by customary norms that ascribe male household-heads the power to manage resources (Bikketi *et al.*, 2016; Farnworth *et al.*, 2023; Vercillo, 2022). This aligns with gender traditional roles where men are considered resource controllers and determinants of how resources are utilised in households (Bikketi *et al.*, 2016; Liu, Anser and Zaman, 2021). Based on this, men have the power to prioritise their needs and interests when determining how resources should be utilised. This perpetuates gender disparities because it disempowers women by impeding and regulating their access to resources and ability to undertake autonomous decisions. In some feminist scholarship, pathways of resource access and control that promote gender inequities are described as the 'gender division of power to regulate the actions of others' (Rocheleau *et al.*, 1996, p.10). The implication of this is that through men's control over resources, power is ascribed to the men to restrict the decisions, actions,

ownership of land and mobility of women farmers. This impacts women's participation in group meetings and agricultural trainings that enhance climate adaptation capacities (Mudege *et al.*, 2016; Ragasa *et al.*, 2013).

Gender resource asymmetries associated with informal resource rights is further evidenced through men gaining more access to land of their choice, farm demonstrations and agricultural information compared to women (Doss *et al.*, 2018; Kristjanson *et al.*, 2017). With respect to material resources, unequal resource access is exemplified through the size, quality and location of land that males and females cultivate. In Ghana, it is stated that men broadly cultivate large and fertile land adjacent to permanent rivers whilst women farm on small and poor-quality land bordering seasonal rivers (Pérez *et al.*, 2014). In most parts of Kenya, men allocate women to farm on small pieces of land (Bikketi *et al.*, 2016) whilst in Tanzania, married women are revealed to have more access to both lowlands and highlands for farming compared to divorced women and widows (Van Aelst and Holvoet, 2016). In some rural communities in Uganda, women's purchase and inheritance of land is restricted based on the belief that such actions contribute to disrespect towards male spouses consequently resulting in unwarranted marriage dissolution (Asiimwe, 2009). Due to customary rules, most women rarely inherit family land even after the demise of a male spouse because family land is normally retained by the deceased's family who control its accessibility, allocation, and utilisation (Anaglo, Boateng, & Boateng, 2014; Khoza, Van Niekerk and NemaKonde, 2019). For other material resources, women commonly have some control over low economic value assets such as dairy products, small ruminants and poultry (Bikketi *et al.*, 2016; Khoza, Van Niekerk and NemaKonde, 2019; Van Aelst and Holvoet, 2016).

Much as informal resource rights and their linkages to gender resource asymmetries have been widely demonstrated in the literature, some divergences are illustrated in relation to marital status. For instance, unmarried, divorced and widowed women in some parts of Tanzania experience less restrictions with regard to purchasing or owning land compared to married women (Van Aelst and Holvoet, 2016). In other studies, married women have better access to early warnings about drought and floods than unmarried women in rural Kenya (Ngigi, Mueller and Birner, 2017). This reveals the possibility of informal resource rights such as customary norms that relate to marriage negating or enhancing women's resource access and control. However, it also underpins the effect of the intersectionality of gender and marital status on women's adaptation decisions and potential differences in the adaptation capacities of women farmers. Intersectional perspectives criticise dealing with women as homogenous categories and recommend paying attention to the interplay of gender with other social variables and their configuration of women's differentiated resource subjectivities (Arora-Jonsson, 2011; Rao *et al.*, 2019). Despite women's resource access and control variations, men are still more advantaged than women due to traditional norms that rarely restrict men's decisions and actions (Ogunlela and Mukhtar, 2009; Sprout, 2022; Tamale, 2004).

3.2.2 Division of responsibilities dynamics

In most rural societies, the responsibilities of household members are traditionally gendered. Reproductive roles such as housework and childcare and productive tasks comprising of production of goods and services for income and remunerated work undertaken within and outside the household are divided on the basis of perceived gender differences (Balgah, Amungwa and Egwu, 2019; Moser, 1992). This division of responsibilities along gender lines presents implications for adaptation decisions of

smallholder women farmers because of potential unequal ascription of roles and responsibilities.

The majority of literature discusses productive and reproductive gender responsibilities in connection with customary rules and regulations. The cultural gendering of responsibilities is associated with gender inequalities because men are accorded superior social positions as household heads, leaders and controllers of major family related affairs (Angula and Menjono, 2014; Niemann *et al.*, 2024; Tambulasi, Mkwambisi and Kamoto, 2021). This contradicts women's inferior social positions which is portrayed through the domestic responsibilities that are traditionally assigned to them such as caring for the home and household members (Niemann *et al.*, 2024). In compliance with gender roles, women are expected to exhibit good behaviour by safeguarding the peace and harmony of their households, exercising silence, calmness, tolerating oppression and battering which is traditionally accepted as a strategy of imparting discipline and submissiveness into women in some societies (Alordiah *et al.*, 2022; Rotimi, 2013). By assigning women domestic responsibilities, they are perceived as servient to men, indecisive, incapable of undertaking constructive and big decisions, lack capacity to live independently and can only be resourceful under the leadership of men (Angula, 2019; lipinge *et al.*, 2000). Such gender perspectives form societal opinions about appropriate work domains and the capabilities of women and men even in managing livelihood challenges that arise as a result of changes in the climate.

The gender allocation of responsibilities determines the livelihood activities that women and men undertake in households and other workspaces where they make adaptation decisions. Women's ascription of domestic responsibilities in most

societies is stated to have contributed to the demarcation of domestic spaces for the women and public spaces for the men (Farnworth *et al.*, 2023; Niemann *et al.*, 2024; Tamale, 2004). This means that the movement of the majority of women is restricted and that they are expected to engage in livelihood activities and climate response strategies that keep them within the domestic spheres. This differs from most of the men who work in public spaces and also have the liberty to take advantage of climate adaptation opportunities available in the domestic arenas.

In some sections of the literature, the connection between gender division of responsibilities and climate adaptation is illustrated through variations in the strategies adopted by females and males in correspondence with their traditional gender roles such as food provision and financing big family decisions (Niemann *et al.*, 2024). Most women are observed to employ measures such as cover cropping, reduction of the number of meals consumed per day, skipping meals and cultivating vegetables to improve food security (Liru and Heinecken, 2021; Van Aelst and Holvoet, 2016). These measures differ from those employed by men such as businesses, migration and livestock sales which are within the male domain (Assan *et al.*, 2018; Van Aelst and Holvoet, 2016). This evidence suggests that smallholder farmers are guided by their traditional gender roles and responsibilities when determining how to cope with climate risks. It is for this reason in part that some measures such as skipping meals which have the potential of posing further welfare dilemmas like malnutrition are adopted by women.

Despite productive and reproductive responsibilities being divided along gender lines, there are some gradual shifts in the roles of women and men. With the intensifying adverse effects of climate change on people's livelihoods, women are broadly getting

more involved in productive work (Aryal *et al.*, 2022; Bikketi *et al.*, 2016; Doss *et al.*, 2022; Farnworth *et al.*, 2023). The productive responsibilities undertaken by women encompasses both agricultural and non-agricultural activities. However, women's engagement in agricultural activities is the most pronounced because generally women depend on agriculture for survival. In the agricultural sector, the increase of women's involvement in farming activities is interpreted as 'feminisation of agriculture'.

Feminisation of agriculture is described as the 'expansion of women's roles in agriculture' (Farnworth *et al.*, 2023, p. 295). This expansion concerns women providing more labour and undertaking more farming responsibilities than the men (Doss *et al.*, 2022; Farnworth *et al.*, 2023). Whilst the rise in women's engagement in productive agriculture can be asserted to enhance women's empowerment, the majority of opposing arguments associate women's heavy engagement in farming to subjugation and exploitation (De Brauw, Kramer and Murphy, 2021; Tavenner *et al.*, 2019). Moreover, some studies observe limited evidence on the connection between women's increased roles and responsibilities in agriculture and reduction in gender inequalities (Doss *et al.*, 2022). However, this does not entirely delink women's involvement in productive work from their socio-economic empowerment. This is because other extant institutional factors such as state policies and cultural norms may enable or inhibit women's realisation of positive benefits from their productive efforts. Policies that relate to gender and property ownership variedly impact women's gain from productive work. For instance, some policy reforms on land improve women's land access and ownership rights thus enhancing their abilities to make decisions about how to productively practice agriculture (Kumar and Quisumbing, 2015; Widman, 2014). This can be argued to improve women's gain from productive activities such as agriculture.

But in divergent literature, land compensation policies that address households as a unit are noted to alienate women because in most households land is controlled by the men (Doss and Meinzen-Dick, 2020). Besides policies, social and culturally oriented factors such as women undertaking more agricultural work than their partners so as to be perceived as the most hardworking and to support their male partners to gain wealth is demonstrated (Rao *et al.*, 2019). This aligns with observations about the close connections between cultural norms and intra-household gender relations (Ampaire *et al.*, 2020; Bikketi *et al.*, 2016; Lawson *et al.*, 2020). Due to the difficulties associated with navigating gender inequities orchestrated by this closely knit relationship, women are stated to adopt creative ways of navigating patriarchy and gender inequalities. In some African feminist scholarship, these creative ways include subtle strategies such as compromise, compliance and silence interpreted as ‘creative agency’ (Ademiluka, 2018; Arrey-Ngang, 2020; Kawarazuka, Locke and Seeley, 2019; Mwine, 2019; Nnaemeka, 2004). To solicit spaces for negotiating their needs and interests, some women are noted to comply with their gender roles and some cultural norms such as keeping within the homestead (Gatwiri and Mumbi, 2020; Kawarazuka, Locke and Seeley, 2019). This draws attention to the diverse aspects that account for women’s pronounced engagement in productive work such as agriculture.

Whilst scholarship reveals significant evidence of women increasingly undertaking productive roles in rural Africa, there is paucity of evidence of men undertaking more reproductive roles (Badstue *et al.*, 2020; Doss *et al.*, 2022; Lastarria-Cornhiel, 2008). Women still undertake most domestic work alongside productive work in rural economies including undertaking some roles that are traditionally assigned to men in some cultures such as tending livestock (Abass *et al.*, 2018; Balgah, Amungwa and

Egwu, 2019; Rao *et al.*, 2020). The broadening of women's roles in the agricultural value chain illustrates not only changing gender roles but also increased involvement of women in family welfare provision such as scholastic materials for school going children, clothing and medical care (Bikketi *et al.*, 2016; Farnworth *et al.*, 2023). This is attributed to the increasing involvement of women in off-farm livelihood activities, the effects of empowerment programmes that target women and increasing livelihood difficulties such as those caused by climate change (Akinagbe and Irohibe, 2015; Awiti, 2022; Bikketi *et al.*, 2016; Ngigi, Mueller and Birner, 2017; Ifejika Speranza, 2006). This depicts how gender division of responsibilities is contemporarily blurred and also signifies women's resourcefulness beyond the domestic domains of livelihood. As most mainstream development and 'women and development' programmes purport, the involvement of women in productive roles should enhance their material and non-material resource endowments such as land, finances, climate knowledge and skills. This in turn is expected to improve women's power to make decisions but scholarship provides opposing evidence. Societal structures that dictate upon women to meet household welfare needs, assign men control over most family resources including women's independent earnings and determination of women's expenditures continue to invisibly disempower women farmers (Diarra *et al.*, 2021; Sachs and Alston, 2010).

3.2.3 Power dynamics

Gender power relations are an integral part of intra-household gender relations because power is a fundamental aspect of decision-making. At household level, gender power relations involve understanding the dynamics that relate to which household members dominate decision-making, whose interests and needs are taken into account, whose viewpoints are considered, and who gets what (Eriksen,

Nightingale and Eakin, 2015; Rocheleau *et al.*, 1996). Gender power relations manifest variedly in households and pose diverse implications on the capacities of household members to engage in adaptation decision-making. In the literature reviewed on gender resource access and control (cf. section 3.2.1), a relationship between resource control and the power to determine adaptation priorities is revealed. The degree of control over resources directly impacts decision-making power of household members (Badstue *et al.*, 2020). Household members with greater resource control tend to have more decision-making power compared to those with less resource control. As a result, the dynamics of gender relations within households can oscillate between concord and discord. This is contingent on the extent to which the needs and interests of those with restricted decision-making power are taken into account in decision-making processes (Deschênes, Dumas and Lambert, 2020; Eriksen and Lind, 2009). But in intra-household gender relations, the absence of conflict in relationships does not necessarily signify equitable fulfillment of the needs and interests of those with limited power such as women. This is because of the influences of customary regulations on the behaviour of women in households (cf. section 3.2.2).

Inequalities in intra-household gender power relations is widely pronounced in gender and climate change literature. Gender power inequalities are characterised by male dominance in household decision-making and women's limited power to determine their own priorities and to holistically contribute to family decisions (Diarra *et al.*, 2021; Diouf *et al.*, 2019; Jost *et al.*, 2016; Juan, 2018; Mudege *et al.*, 2017; Tanjeela and Rutherford, 2018). Other aspects of gender power inequities concern women's restricted movements, engagement in small household decisions that concern daily operation of the home whilst men make big financial decisions such as investments

undertaken on behalf of the family (Adzawla *et al.*, 2019; Bomuhangi *et al.*, 2016; Gupta, Yagnaraman and Jagati, 2022; Mbih *et al.*, 2018; Niemann *et al.*, 2023). The decisions that women and men make normally corresponds with their gender responsibilities (cf. section 3.2.2). Moreover, African feminists argue that patriarchal systems exacerbate gender inequities by burdening women with cultural responsibilities which keep them powerless and at the bottom of decision-making structures (Atanga, 2013; Chaney, 2011). This draws attention to the interplay between customary regulations and gender power relations in households. By ascribing men social positions as decision-makers and controllers of household resources (cf. section. 3.2.1, 3.2.2), males are symbolised as the epitome of power in households whilst females continue being disempowered.

Even though women's power to make decisions is limited in most households, some studies reveal the contrary. Some women, most especially widows and occasionally those whose spouses work far away, take the lead in family decisions (Sell and Minot, 2018; Van Aelst and Holvoet, 2018). Based on this, men's absence can be stated to improve women's resource decisions and also finances especially when male partners send financial support (Klasen, Lechtenfeld and Povel, 2015; Quisumbing and Doss, 2021). This can relate to the situation of female household heads who possess some power to make decisions. The absence of male household heads present women with better opportunities to autonomously plan and choose from available climate adaptation options. For example, female household heads are observed to have more power to decide how to utilise family land in the event of climate shocks compared to women in male-headed households who commonly rely on their spouses to allocate them land to cultivate (Anjum, 2020; Doss, 2018). Such variance in the power of females signifies that some women have power similar to that of the men to decide

how to safeguard their livelihoods from adverse climate events compared to those in male-headed households. Without discounting this evidence, women across rural Africa may still grapple with unequal power relations despite how fair power structures may appear. This is because power relations are nested with socio-cultural practices such as beliefs, norms, customs and traditions that function in local and broader spaces where power relations are configured.

In summary, gender and climate change scholarship reveals pervasive gender inequalities concerning resource access and control, division of responsibilities and power relations within households. These inequities are shown to construct climate adaptation capacities and to interplay with women's adaptation decisions (e.g. Adzawla *et al.*, 2019; Angula, 2019; Assan *et al.*, 2018; Djoudi and Brockhaus, 2011; Diarra *et al.*, 2021; Mayanja *et al.*, 2022; Ngigi, Mueller and Birner, 2017). Gender inequalities in resources, responsibilities and power relations have been extensively explored in connection to their influences on women's climate vulnerabilities. The majority of studies utilise a binary analytical framework that majorly focuses on material relationships between female and male farmers to examine the linkages between intra-household gender relations and women's adaptation decisions. There is also a limited focus on the broader gender power relations such as ideological relations which I explore in detail later (cf. section 3.4.1). Few studies pay attention to heterogeneities among women farmers and their connections to adaptation decisions (e.g. Klasen, Lechtenfeld and Povel, 2015; Van Aelst and Holvoet, 2016). Furthermore, scholarship recognises that gender inequalities in resources, responsibilities and power relations intersect with broader institutional contexts and shape women's climate change adaptation (e.g. Eriksen and Lind, 2009; Shackleton *et al.*, 2015; Yadav and Lal, 2018). But seldom are these intersections explored in-

depth. To comprehend these interconnections, it is critical to review literature on institution interactions which I undertake in the next section.

3.3 Interactions of gendered institutions and adaptation decisions

The literature review in the earlier section highlights the connections between the interactions of gender, institutions and women's adaptation decisions (cf. section 3.2). This section explores gendered institutions in detail by initially delineating the concepts of institutions and gendered institutions. Subsequently, review of literature on the interactions of gendered institutions is undertaken whilst elucidating the relationship between these interactions and women's adaptation decisions.

3.3.1 Conceptualising institutions

The concept of 'institution' is variedly conceptualised across disciplines. The most common are interpretations based on institutional configuration of social interactions and human behaviour. One of the prominent definitions is that in which institutions are referred to as rules of the game that shape social interaction in political, economic and social spaces (North, 1990). In this definition, institutions are interpreted as humanly devised formal or informal rules which define how the game is played and the team that plays aims at winning (North, 1990). Formal rules include policies, laws, constitutions and property rights whilst the informal comprises of rules such as traditional norms and codes of conduct and their implementation characteristics (North, 1990,1991,1994). Based on this, the rules of the game can comprise of those that regulate decision-making and access to resources whilst the players are the people who draft, redraft and implement rules. Just like any other sporting games like football, netball or basketball, the rules must be followed and the outcome is dependent on how the game is played. In the context of women's adaptation decisions,

this raises concerns about the fairness of prevailing rules, their implementation and outcomes.

Related to the 'rules of the game' and its connection to potential outcomes, institutions are described as frameworks of rules for achieving social or economic 'ends' (Kabeer and Subrahmanian, 1996). In the context of gender, it is observed that the way rules are implemented can produce, reinforce, and reproduce social equalities and inequalities in different spaces such as the family, community, state and market (Kabeer, 1994). Similar to the role of players in a game, institutional actors can contribute to institutional outcomes such as enhanced or constrained decision-making capabilities of women farmers through their implementation of rules (Kabeer and Subrahmanian, 1996). This implies that the existence of rules, whether formal or informal, and the proclamation of these rules do not always contribute to desired outcomes. This is because rules are abstract and are operationalised by people whose perspectives, beliefs and behaviour can configure outcomes (Helmke and Levitsky, 2004; Hodgson, 2006). Therefore, depending on how various actors interpret and implement rules, even those that are sensitive to the needs and interests of women and men can constrain women's adaptation decisions. In a related description, institutions are referred to as the rules and conventions of society that facilitates coordination among societal members and shapes human interactions (Bromley, 1989). Since the rules that facilitate human coordination and interactions are formal or informal, institutions can be construed as part of the climate adaptation behaviours of smallholder women farmers.

In slightly contrasting conceptions of institutions that depart from emphasising institutions as 'means', the nature of institutions and institutional linkages to social

interactions are foregrounded. In this regard, institutions are interpreted as durable and dynamic systems that embed with social rules, cultural norms and practices that configure social interactions (Cleaver, 2002; Hodgson, 2006; Lowndes, 2020; Waylen, 2014; Whaley, 2022). The durable and dynamic nature of institutions signifies that institutions function in ways that construct, reconstruct and sustain social equalities or inequalities in different decision-making environments. The durable and dynamic institutional framing of social equalities and inequalities occurs in unstructured and multi-directional ways impacting human interactions and actions in multi-faceted ways (Rocheleau et al., 1996; Rodima-Taylor, Olwig and Chhetri, 2012; Kabeer, 1996).

When conceptualising institutions in social science research, specific interpretations are seldom prescribed except in areas of focus when undertaking institutional analysis. In some environment related literature, it is recommended that the analysis of institutions should focus on decision-making, choices, whose interests are protected, how resource rights are shaped and policies formulated (Vatn, 2007). This is because environmental issues are intricate and they conjure the involvement of different actors and power structures through which interests of some society members can be prioritised over the others (Deschênes, Dumas and Lambert, 2020; Eriksen and Lind, 2009). The intricate nature of institutions relates to the 'plural and patchy' features of institutional functionality (Whaley, 2022, p.37). The pluralities and patchiness of gendered institutions implies that rarely do institutions focus on a single issue, instead, they engage with multiple dilemmas, operate at multiple scales and exhibit varying levels of activity depending on the context within which they function (Amaru and Chhetri, 2013; Fischer *et al.*, 2021). In such functionality, institutions dedicated to women's empowerment may as well integrate women's agricultural adaptation to climate change and play a more proactive role in situations of gender-based violence

and conflict. This contributes to ‘fuzziness’ and complicates understanding of how institutions operate and their resultant effects on social interactions (Young, 2002).

The interpretation of institutions in my thesis is informed by the conceptualisation of North (1990) and Kabeer (1994). Both interpretations underscore rules as critical aspects that configure human interactions and the outcomes of those interactions. Moreover, North (1990) and Kabeer (1994) recognise institutions as formal and informal and the role of rules in the configuration, reconfiguration and sustenance of social equalities and inequalities such as those that relate to gender. But I am also cognisant of the durable and dynamic characteristics of institutions (e.g. Cleaver, 2002; Hodgson, 2006; Waylen, 2014). Durability and dynamism of institutions contributes to adaptation decision-making prospects and limitations. Based on this, I conceptualise institutions as durable and dynamic formal and informal rules that enhance or constrain adaptation decisions of smallholder women farmers. In order to gain foundational insights of how institutions shape adaptation decisions of smallholder women farmers, I review literature on the gendered nature of institutions referred to in my thesis as ‘gendered institutions’ in the next section.

3.3.2 Gendered institutions

In line with the discussion on gender as ‘doing’ and its performative effects in enabling and inhibiting adaptation decisions of women farmers (cf. section 3.1.1), gender intersects with institutions. The concept of ‘gendered institutions’ implies that gender is entrenched in the processes, practices, symbols, ideologies and in the interplay of formal and informal institutions (Acker, 1992). In substantiating perspectives about the embeddedness of gender in institutions, gender is recognised as engrained in institutions impacting institutional outcomes (Chappell, 2010; Mackay, 2011). Based

on this, gender as a social variable can be stated to exist in institutions. This questions whether the entrenchment of gender in institutional components implies that all institutions are gendered. Further, this raises concerns about the basis for classifying all institutions as gendered. Informed by Rothstein's (1996, p. 145) assertion that if institutions 'mean everything then it means nothing', arguing that all institutions are gendered can similarly imply that the concept of 'gendered institutions' becomes meaningless. This makes understanding the aspects that constitute gendered institutions imperative.

Gendered institutions are interpreted in some studies based on four aspects through which gender interlinks with formal and informal rules. It is noted that rules concern gender, rules have gendered effects, implementors of rules have genders and are gendered and the outcomes of rules are shaped by gender (Lowndes, 2020). In Lowndes's (2020) elucidation of these perspectives, institutions are underpinned as gendered on the basis that, rules allocate women and men different responsibilities, actions and behaviours. Additionally, women and men are observed as distinctively affected by existing rules and that institutional actors possess binary (male or female) or non-binary bodies with differing perspectives, attitudes, values and beliefs. Lastly, institutional outcomes impact women and men differently due to differing needs and interests and that they also shape gender (Lowndes, 2020).

In other perspectives, gendered institutions are broadly described on the basis that gender shapes the interpretation, implementation and impacts of formal and informal rules on human interactions (Connell, 2009; Kenny, 2007; Mersha and Van Laerhoven, 2016). To exemplify the effects of gender, relationship patterns within institutions termed as 'gender regimes' and the alignment of these relationship

patterns with the wider social order defined as 'gender order' are linked to the functional effects of gender (Connell, 2009). The patterns of relationships referred to here encompass how institutional actors relate with each other and the general society when implementing rules. Besides that, the interconnection between patterns of relationships (gender regimes) and the wider social order (gender order) means gender interplays with other societal social factors such as culture and affects the interpretation and implementation of rules. In these ways, gendered institutions are asserted to distinctively impact adaptation actions of women and men smallholder farmers as discussed earlier (e.g. Lowndes, 2020). Therefore, institutions cannot be perceived as gender neutral.

However, interpreting institutions as gendered on the basis of gender differentiated impacts raises concerns about describing institutions as gendered even when rules impact women and men in similar ways. This begs the question, do gendered institutions necessarily impose gender differentiated effects on the adaptation decisions of women and men smallholder farmers? As demonstrated earlier (cf. section 3.2), the intersecting effects of gender with other social variables such as education and marital status can contribute to institutions comparably configuring adaptation decisions of women and men. In addition, since the binary categorisation of gender (female and male) rarely interprets gender exhaustively (Kenny, 2007; West and Zimmerman, 2009), the performative effects of other social identities such as class, race and ethnicity may contribute to adaptation decisions of women and men being similarly impacted by gendered institutions. But still, it is widely evidenced that institutions impact women and men variedly due to gendered socio-economic heterogeneities and vulnerabilities (e.g. Bremer *et al.*, 2021; Lawson *et al.*, 2020 Mersha and Van Laerhoven, 2016). This signifies that gendered institutions can be

interpreted on the basis that institutions affect men's and women's adaptation decisions variedly.

To emphasise the centrality of gender in institutions and institutional interplay, gender is stated to permeate institutions like 'rings inside a tree trunk' (Lowndes, 2020, p.544). This denotes that even when institutions interact functionally or normatively (Young, 2002), the influences of gender are normally evident. In connection with the conceptualisation of institutions in my thesis (cf. section 3.3.1) and informed by these vantage points, I deduce my conception of gendered institutions. I conceive gendered institutions as formal and informal rules that interplay with men's and women's resource access and control, division of responsibilities and power in ways that enhance or constrain their capacities to decide how to adapt to climate change. These institutions include gender policies, gender and family related laws on property and gender-based violence, agricultural policies, regulations of financial and credit agencies, cultural norms, traditional sayings and codes of conduct. Through the interrelationships between the interactions of gendered institutions and intra-household gender relations, adaptation decisions of smallholder women farmers may be structured in similar or distinct ways from that of men as discussed in the subsequent section.

3.3.3 Interactions of gendered institutions

The interactions of gendered institutions manifest in diverse ways that enable or constrain institution functionality and achievement of desired goals and objectives. Gendered institutions categorised as formal and informal (cf. section 3.3.2) interact in situations where they possess similar or distinct objectives (Helmke and Levistky, 2004; Kabeer, 1994; Kenny, 2007; Young, 2002). These interactions occur in

institutional sites such as the family, community, market and state (Kabeer and Subrahmanian, 1996). The interactions between gendered institutions are variously classified whilst conjuring different categories of gendered institutions that interact and the embeddedness of power dynamics in institutional interplays.

In some institution scholarship, the interaction of gendered institutions has been classified as horizontal, vertical, functional and political (Young, 2002). Horizontal interaction refers to interplay between gendered institutions at the same level such as national regulations whereas vertical interaction is where gendered institutions interplay across levels such as national and local rules (Young, 2002). On the other hand, in functional interaction, gendered institutions interplay based on commonalities in activities, problems and work environments whilst politically, gendered institutions interplay to achieve individual or collective objectives even where differences exist (Young, 2002). These classifications demonstrate 'formal-formal', 'informal-informal' and 'formal-informal' gendered institution interactions. The interplay of gendered institutions persists regardless of power levels, workspaces and objectives implying that interactions transcend institutional boundaries. This broad spectrum of interplay denotes that some interactions can be symmetrical, asymmetrical, unidirectional or multidirectional. Interactions that are mostly asymmetrical and multidirectional such as 'formal-informal' are mostly characterised by complex power dynamics that present myriad of implications for adaptation decisions. Complexities link to prioritisation of needs and interests amidst contesting resource uses and power disparities (Deschênes, Dumas and Lambert, 2020; Eriksen and Lind, 2009). Besides, informal rules are stated to operate in spaces bounded by formal gender rules (Angst, 2019; Po *et al.*, 2019). This elicits my concentration on 'formal-informal' interplays and their effects on women's adaptation decisions.

Formal-informal interactions of gendered institutions have been clustered as complementary, accommodating, competing and substituting (Helmke and Levitsky, 2004). However, complementarity and competition sharply contrast each other because they predominantly enhance or undermine the realisation of formal gendered institutional outcomes whilst accommodation and substitution can both positively and negatively impact the outcomes of formal gendered rules. This reiterates the argument that the interactions of formal and informal institutions may contribute equities or inequities in gender relations (Kabeer, 1994; Kenny, 2007; Lowndes, 2020).

Complementary interaction

Complementary interaction describes collaboration between formal and informal gendered institutions to address deficiencies of formal rules (Helmke and Levitsky, 2004). In this interaction, informal rules such as social norms serve as the foundation for implementing formal rules whilst norms, routines and procedures ease decision-making within bureaucracies (Helmke and Levitsky, 2004). Complementary interaction is characterised by partnership, coordination and cooperation between formal and informal institutions (Birchall and Bonnett, 2021; Juhola and Westerhoff, 2011; Siders and Pierce, 2021). Moreover, it also encompasses collaborative planning, resource mobilisation and allocation (Nunan, Hara and Onyango, 2015). In climate adaptation studies, the above aspects are noted to solicit inclusive and responsive climate policies and plans and to advance equitable access to training, finances and delivery of climate services (Amaru and Chhetri, 2013; Hamilton and Lubell, 2019; Paudel *et al.*, 2013; Pelling *et al.*, 2008). This illustrates potential positive relationships between complementary interactions and the abilities of women to make adaptation decisions.

The positive linkages between complementary interaction and climate adaptation are evidenced in some studies. Through collaboration of formal and informal institutional actors, locally and globally relevant short and long-term adaptation measures are observed to have been adopted and effectively implemented by farmers in Asia and Africa (Amaru and Chhetri, 2013). Additionally, in some countries in Europe, formal and informal institutions are stated to work together to address labour, equipment, knowledge and skills deficiencies to improve adaptation planning and timely implementation of adaptation practices in Norway (Eriksen and Selboe, 2012). Despite the positive correlations between complementary interaction and climate adaptation being evidenced, rarely do studies document gender differentiated effects of complementary interactions on climate adaptation decisions. Owing to this observation, it can be asserted that although complementary interaction may generally invoke positive effects on climate adaptation, this may not always be the case due to socio-economic and cultural vulnerabilities of women farmers (cf. section 3.2).

Accommodation interaction

With regards to accommodation, informal gendered institutions tolerate formal institutions by refraining from directly violating formal rules (Helmke and Levitsky, 2004). Instead, informal gendered institutions provide incentives that encourage people to act in ways that undermine formal institutional outcomes (Helmke and Levitsky, 2004). These incentives include norms that perpetuate prejudicial attitudes towards women who claim and defend their rights. For instance, some cultural norms label women who defend their rights and claims as 'ill behaved' whilst those who rarely defend themselves as 'well behaved' (Alordiah *et al.*, 2022; Rotimi, 2013). So, even though customary rules do not directly oppose formal rules that promote women's

empowerment, outcomes can be compromised because some women would not want the negative labels and so will endure gender related oppression and subjugation.

It is therefore noted that through accommodation, informal gendered institutions contradict the 'spirit but not the letter' of formal gendered institutions (Helmke and Levitsky, 2004, p. 729). This illustrates how accommodation interplay tacitly affects women's climate response. The tacit impacts of accommodation on women's adaptation decisions correspond with the resultant effects of unequal gender division of responsibilities informed by cultural norms explored in previous studies (cf. section 3.2.2). Women's reproductive and productive work burden exacerbates inequities in access to agricultural training and information even where policies promote training for farmers irrespective of their genders (Aryal *et al.*, 2022; Bikketi *et al.*, 2016; Farnworth *et al.*, 2023). This questions homogenise the positive linkages between explicit reception and collaboration of formal and informal gendered institutions and climate adaptation decisions. Accommodation just like complementary interplay can enhance adaptation decisions but at varying levels.

Competition interaction

Competition contrasts with complementary interaction in that it adversely undermines the attainment of formal institutional outcomes. In competition interplay, informal gendered institutions violate and ignore formal rules in the sense that they create incentives that are incompatible with formal rules so as to undermine the outcomes of formal rules (Helmke and Levitsky, 2004). The use of incentives in competition is quite similar to accommodation interaction where women who claim and defend their rights are negatively labeled. But competition departs from accommodation in that incentives do not only contradict formal gendered rules tacitly but also contradict saliently. In

competition, customary rules may contradict formal institution provisions about land rights (Doss *et al.*, 2018; Kristjanson *et al.*, 2017).

This draws attention to the adverse negative effects of competition on the realisation of formal gendered institution outcomes such as gender equity in resource access in comparison to complementarity, accommodation and substitution interactions. In competition interaction, patriarchal systems and associated gender norms restrict women's land rights such as inheritance and participation in agricultural training despite the existence of formal rules that advance gender equality (Etale and Simatele, 2023; Ramaroson *et al.*, 2022). In the majority of studies on rural Africa, material and non-material resource rights of women are disclosed to have been fundamentally undermined by regressive cultural norms and practices (cf. section 3.2). This manifests abuse of power and exploitation of the powerless by the powerful (Bremer *et al.*, 2021; Nightingale, 2017). However, other social factors such as education have been noted to invoke positive outcomes even in competition interaction especially when people seek support from national laws (Fischer *et al.*, 2021).

Substitution

Substitution interaction occurs through informal gendered institutions taking the place of formal gendered institutions with the aim of achieving outcomes that are compatible with those of formal rules (Helmke and Levitsky, 2004). In situations where formal gendered rules are weak, constrained and have barely achieved intended outcomes such as equitable gender resource access, substitution interaction is pronounced. Substitution is evidenced through the creation of informal institution arrangements to address gender resource disparities and other inadequacies of formal gendered rules. For instance, informal gendered institutions such as groups facilitate pooling of labour

and finances, access to training and land among poor and marginalised smallholder farmers such as women (Lawson, 2020; Ngigi, Mueller and Birner, 2017; Whaley, 2022; Rodima-Taylor, 2012). In natural resource management, the replacement of the formal monitoring unit by a functional local taskforce to mitigate timber theft and conserve the environment in Ghana illustrates substitution interaction (Osei-Tutu, Pregernig and Pokorny, 2015). This replacement is linked to the failures of the formal monitoring arrangements in curbing timber theft.

In summary, the discussions above show that the interactions between formal and informal gendered institutions can enable or impede the capacities of women to make adaptation decisions. Some institution related studies associate the outcomes of institution interactions to factors such as transparency, accountability, coordination and sincerity (High *et al.*, 2006; Nunan *et al.*, 2018; Valdivieso, Andersson and Villena-Roldán, 2017; Whaley, 2022). These factors may construct positive or negative outcomes of the interactions of gendered institutions. Moreover, the interactions of institutions and their functionality are stated to be shaped by power dynamics (Nightingale, 2017). These power dynamics determine which gendered institutions gain or lose in terms of their realisation of desired goals and objectives. As a result, the interactions of institutions can be characterised by 'conflict, cooperation, complementarity or co-existence' (Rocheleau *et al.*, 1996, p.13). In other studies, power struggles and rivalry in fulfilling shared mandates such as revenue collection are noted to curtail the benefits of institutional interplays (Nunan, Hara and Onyango, 2015). This means that power relations are pivotal in the interlinkages between intra-household gender relations and adaptation decisions. To unravel this intricate interrelationship and its effects of women's adaptation decisions, institutional analysis literature recommends assessing institutional components such as rules, activities,

resources, people and power relations (Biesbroek *et al.* 2014; Kabeer, 1994; Oberlack, 2017). These perspectives foreground the major theoretical framework of this study, FPE and the complementary theory, SRA discussed in the next section

3.4 Theoretical frameworks

Guided by evidence in the literature review about the linkages between intra-household gender relations, institutions and climate adaptation decisions, this section reviews literature in connection to FPE and SRA. Discussions centre on FPE, the main theoretical underpinning of this study and SRA perspectives adopted to complement analysis in this study. I explore the application of FPE and SRA in previous studies, significance, criticism and contribution to my thesis. I predominantly rely on FPE to guide the analysis of how the interactions between gendered institutions and their interlinkage with intra-household gender relations influence adaptation decisions of women farmers. The centrality of FPE in my research is informed by its emphasis on the interconnections between gender relations and formal and informal structures and their implication on environmental decisions (Rocheleau *et al.*, 1996). Informed largely by Rocheleau *et al.*'s (1996) FPE framework, I organise my analysis around three aspects, resources, responsibilities and power relations. These aspects relate to the three major themes 'gendered knowledge, gendered environmental rights and responsibilities and gendered environmental politics and grassroots activism' that FPE explores (Rocheleau *et al.*, 1996, p.4-5). In these three areas, FPE discloses the workings of institutions (de jure and de facto), their configurations of gender relations and environmental decisions. The correlations between gendered institutions most especially customary rules and women's adaptation decisions are also revealed in substantial literature (e.g. Bikketi *et al.*, 2016; Diarra *et al.*, 2021; Garcia, Tschakert and Karikari, 2020; Lawson *et al.*, 2020).

Despite the applicability of FPE framework in gendered institutional analysis and its centrality in my thesis, I also incorporate Kabeer's (1994) SRA in my analysis. This decision was informed by the observation that FPE did not provide a clear structure and specific parameters for analysing the interactions between formal and informal gendered institutions in comparison to SRA. In my research, SRA contributes to the analysis of the interactions between gendered institutions through some of its five prescribed parameters for analysing institutions. These five parameters are rules, activities, resources, people and power. These parameters are prominently asserted to facilitate institutional interplay in literature (e.g. Goodrich, Udas and Larrington-Spencer, 2019; Oberlack, 2017). However, in my analysis, I prioritise two of the five parameters of SRA, rules and power, because as evidenced in the literature (cf. section 3.1, 3.2), they strongly interrelate to the aspects of intra-household gender relations that my study interrogates, resource access and control, division of responsibilities and power relations. There is paucity of evidence of the linkages between the other three institutional elements of SRA (people, activities and resources) and intra-household gender relations in previous studies. And yet, gendered institutions also interplay through the above mentioned aspects. I will discuss the application of FPE and SRA in this study later (cf. section 3.4.3).

3.4.1 Feminist Political Ecology (FPE)

FPE recognises the linkage between gender, environmental concerns and people's everyday lives. These interconnections are observed to influence how women experience and respond to environmental challenges such as climate change. The seminal work of Rocheleau *et al.* (1996) situates gender as a critical social variable which constructs power relations just like other ecological feminists (e.g. Gaard, 2011; Mellor, 1994; Robbins, 2019). However, Rocheleau *et al.*, (1996) deviates from earlier

environment and feminist perspectives such as political ecology and ecofeminism. Rocheleau *et al.*'s (1996) FPE framework underscores the *intersectionality* of gender with other social variables such as culture and class and their construction of environmental decisions in different institutional spaces. The intersectional effects of gender and social factors such as culture and marital status on women's climate responses have further been established in previous studies (cf. section 3.1, 3.2). This demonstrates the 'interconnectedness of all life' with power structures that engender environmental opportunities and struggles (Rocheleau *et al.*, 1996, p. 296).

The power structures that smallholder women farmers navigate comprise of formal and informal gendered institutions functioning across local, regional, national, or international scales. These structures dictate human relations in institutional sites like households, communities, and the broader society. Masculine ideologies such as patriarchy which through de facto power shape and reshape gender power relations constitute part of the power structures that women negotiate (Rocheleau *et al.*, 1996; Van Aelst and Holvoet, 2018). In the FPE approach, analysis of gender relations centre on unravelling the gendered struggles for survival, rights and responsibilities and women's collective actions in addressing everyday environmental concerns (Rocheleau *et al.*, 1996). In all the aforementioned aspects, FPE evaluates how formal and informal institutions configure environmental decisions. This approach to analysing gendered institutions and women's adaptation decisions contribute to a detailed and nuanced understanding of the configurations of women's climate actions (Rocheleau *et al.*, 1996; Sultana, 2021; Sundberg, 2017). This departs from gender analysis approaches employed in the majority of the previous studies that simply pay attention to differences between females and males rather than how power relations are diffused through a myriad of formal and informal institutions. For example, with the

guidance of FPE, the linkages between gendered institutions and environmental practices can be examined to understand ‘why and how the denial of women’s access to development, land and other resources is maintained over space and time’ (Elmhirst, 2015, p. 523). This in part accounts for the innovative utilisation of FPE in different studies that interrogate gender power relations and their interrelationships with environmental actions.

In environment related studies, FPE perspectives are utilised to explore gender dynamics and their contributions to gender power disparities in different workspaces (Bavington, Grzetic and Neis, 2004; Resurreccion 2017; Truelove, 2011; Vercillo, 2022). More specifically, in climate change scholarship, FPE is applied to analyse gender power dynamics embedded in gendered institutions and their connections to gendered climate vulnerabilities and responses (e.g. Gonda, 2019; Mugeni, 2023; Nyantakyi-Frimpong and Bezner-Kerr, 2015; Tschakert, 2012). In Gonda’s (2019) study, FPE is utilised to elicit lessons and insights for developing gender and climate relevant gendered formal institutions such as policies. In Nyantakyi-Frimpong and Bezner-Kerr’s (2015) work, subtle workings of informal rules in households such as norms and patriarchal values and their effect on access to climate information services and knowledge are revealed by FPE perspectives.

In other studies, FPE guided the examination of the interplay between gender and institutions in the broader context and their effects on adoption of traditional and modern crop varieties in households (Bhattarai, Beilin and Ford, 2015; Nightingale, 2006). The relevance of FPE in analysing power relations, institutions, resilience, environmental justice and climate action in climate related studies has also been shown (Ekowati *et al.*, 2023; Elmhirst, 2015; Garcia *et al.*, 2022; Resurreccion, 2017).

For instance, FPE is central to gaining nuanced comprehension of the interconnection between power disparities and climate resilience in which the oppressive effects of masculine agendas on adaptation capabilities and decisions of the marginalised is disclosed (Garcia *et al.*, 2022). Furthermore, analysis of entwined and multi-scalar correlations of different power axes such as gendered institutions and their linkage to the production and reproduction of multiple power inequities are undertaken with the guidance of FPE perspectives (Garcia and Tschakert, 2022; Resurreccion, 2017). These diverse application of FPE reveals its significance in gendered institutions and environment related research although its earlier framework has been criticised in some sections of literature.

The most pronounced criticism of FPE approach relates to the earlier works of feminist political ecologists (Rocheleau *et al.*, 1996). This earlier FPE theory has been challenged by new feminist political ecologists and other feminists for prominently analysing gender and its relations using a binary approach. The binary approach focuses on disparities in women's and men's access and control to environmental resources, responsibilities and power relations (e.g. Elmhirst, 2011; Mollett and Faria, 2013). Moreover, the earlier FPE perspectives have also been criticised for paying little attention to the intersectionality between gender and other gender pluralities such as age, race, class, ethnicity and culture that shape people's environmental experiences (Mollett and Faria, 2013). Nonetheless, new feminist political ecologies have reinvigorated earlier perspectives by utilising an intersectionality approach to analysing gender relations (Goodrich, Udas and Larrington-Spencer, 2019; Gonda, 2019; Mollett and Faria, 2013; Nightingale, 2011; Rocheleau, 2015; Truelove, 2011). In fact, intersectionality is acknowledged as 'a key shift in FPE theorisation in recent years' (Sultana, 2021, p. 158).

The intersectional approach concentrates on understanding multiple dimensions through which gender power relations are constituted thus enhancing comprehensive analysis of power dynamics that contribute to unequal adaptation alternatives across genders (Hackfort and Burchardt, 2018; Nightingale, 2011). Informed by the observation that ‘environmental struggles are closely embedded with processes of constant negotiation of power and assertion of authority’ (Ekowati *et al.*, 2023, p. 212), intersectionality permits the exploration of linkages and interlinkages between processes, practices and perspectives that constitute gender power relations and impact environmental decisions. Informed by these perspectives, I integrate an intersectionality lens in my assessment of how the interactions of gendered institutions shape women’s adaptation decisions through configuring women’s access and control over resources, responsibilities and power relations. Through this strategy, I examine how pluralities such as education, leadership position, gender of children, marital status, marriage type, ethnicity and livelihood sources interconnect with gender and configure how women decide to adapt to climate change.

3.4.2 Social Relations Approach (SRA)

As revealed in the literature, there is a connection between the interactions of gendered institutions, intra-household gender relations and climate change adaptation decisions of women farmers. Through interaction, gendered formal and informal institutions impose implications for women’s adaptation decision by impacting access and control over resources, division of responsibilities and power relations (cf. section, 3.2, 3.3). Kabeer’s (1994) SRA underpins the interactions of institutions and observe that these interplays manifest in the family, community, market and state referred to as ‘institutional sites’. It is in these sites that institutions construct and reconstruct

social inequalities (Kabeer, 1994). As disclosed in the literature, the manner in which gendered institutions shape women's adaptation decisions depends on the nature of institutional interplay (cf. section 3.3.2).

In SRA, formal and informal institutions interplay through implementation of rules and regulations that include both official and unofficial goals and objectives (Kabeer, 1994). This implies that the effects of institution interaction on adaptation decisions are varied and complex thus requiring critical analysis that also focuses on beliefs and value systems. In order to undertake analysis of how gendered institutions interact, SRA emphasises examining five aspects. These aspects, rules, activities, resources, people and power, constitute the routinised practices of gendered institutions and facilitate the construction of power hierarchies, determination of what level power lies, who dominates decision-making and which social groups gain or lose when decisions are made.

Much as SRA is useful in analysing the interactions between gendered institutions, it has been criticised for being complex thus presenting methodological dilemmas emanating from its multiple level of analysis in the family, community, market and the state (Hillenbrand *et al.*, 2014). However, in some sections of the literature, SRA is perceived as holistic, theoretically relevant and robust framework for analysing institutions because it extends beyond the household and community (Hillenbrand *et al.*, 2014; Maruzani, 2022). This accounts for its adoption in earlier climate change, fisheries and agriculture related studies (e.g. Gebreyes, 2018; Hillenbrand *et al.*, 2014; Manyungwa, Hara and Chimatiro, 2019; Resurrección *et al.*, 2019). In climate change research, SRA has been employed to guide analysis of the intersectionality between institutions and gendered climate vulnerabilities (e.g. Goodrich, Udas and Larrington-

Spencer, 2019; Resurrección *et al.*, 2019). However, in both studies, FPE is incorporated to conceptualise how gendered climate vulnerabilities are configured through the interrelationship of formal and informal institutional context factors. This aligns with the theoretical framing of my thesis because it largely utilises FPE complemented by SRA but the point of departure is my thesis focus. I interrogate the interactions between gendered institutions and its interconnection with intra-household gender relations and the implications these interactions impose on adaptation decision-making capacities of women farmers.

3.4.3 Application of FPE and SRA in analysis

My analysis of the interconnections between the interactions of gendered institutions and intra-household gender relations and their effect on adaptation decisions of women farmers is majorly guided by Rocheleau *et al.*'s (1996) FPE framework and FPE's ensuing arguments on environment and gender. Guided by FPE perspectives, I unravel how the interactions between formal and informal gendered institutions interlink with intra-household gender relations and construct equities and inequities. I also show how the outcomes of these interrelationships enable or constrain the abilities of women to make adaptation decisions. This analysis is undertaken by examining contrasts and similarities in men's and women's access and control over resources, division of responsibilities and power to determine priorities in households. In terms of adaptation decisions, I focus on variations in men's and women's capacities to implement available on-farm and off-farm adaptation strategies, practice appropriate implementation methods and adaptation intensities.

To analyse how gendered formal and informal institutions interact, I integrate Kabeer's (1994) SRA as a complementary guide. As noted earlier (cf. section 3.4), I

incorporated SRA because FPE does not provide a clear structure for examining the interactions between formal and informal gendered institutions. My decision to integrate SRA perspectives is further substantiated by some scholarly perspectives about Rocheleau *et al.*'s (1996) FPE framework being a 'loosely configured framework' (Ekowati *et al.*, 2023; Elmhirst, 2015). This denotes potential complexities in its applicability such as those that relate to assessing interactions of gendered institutions. For instance, FPE assesses 'powerful underlying structures which operate to the benefit of certain classes and groups' across local and international boundaries (Rocheleau *et al.*, 1996, p. 296). But still, it does not explicitly show how to undertake in-depth examination of power structures including formal and informal rules that determine people's climate actions. This may in part explain why there is hardly evidence of FPE being employed to analyse institution interactions. I therefore analyse the interactions of gendered institutions using two of the five aspects for analysing institutions stated in Kabeer's (1994) SRA. These elements, rules and power, are selected in line with my conceptualisation of gendered institutions as formal and informal rules and the evidence of the intricate connections between the execution of rules and power relations revealed in the literature review (cf. section 3.3).

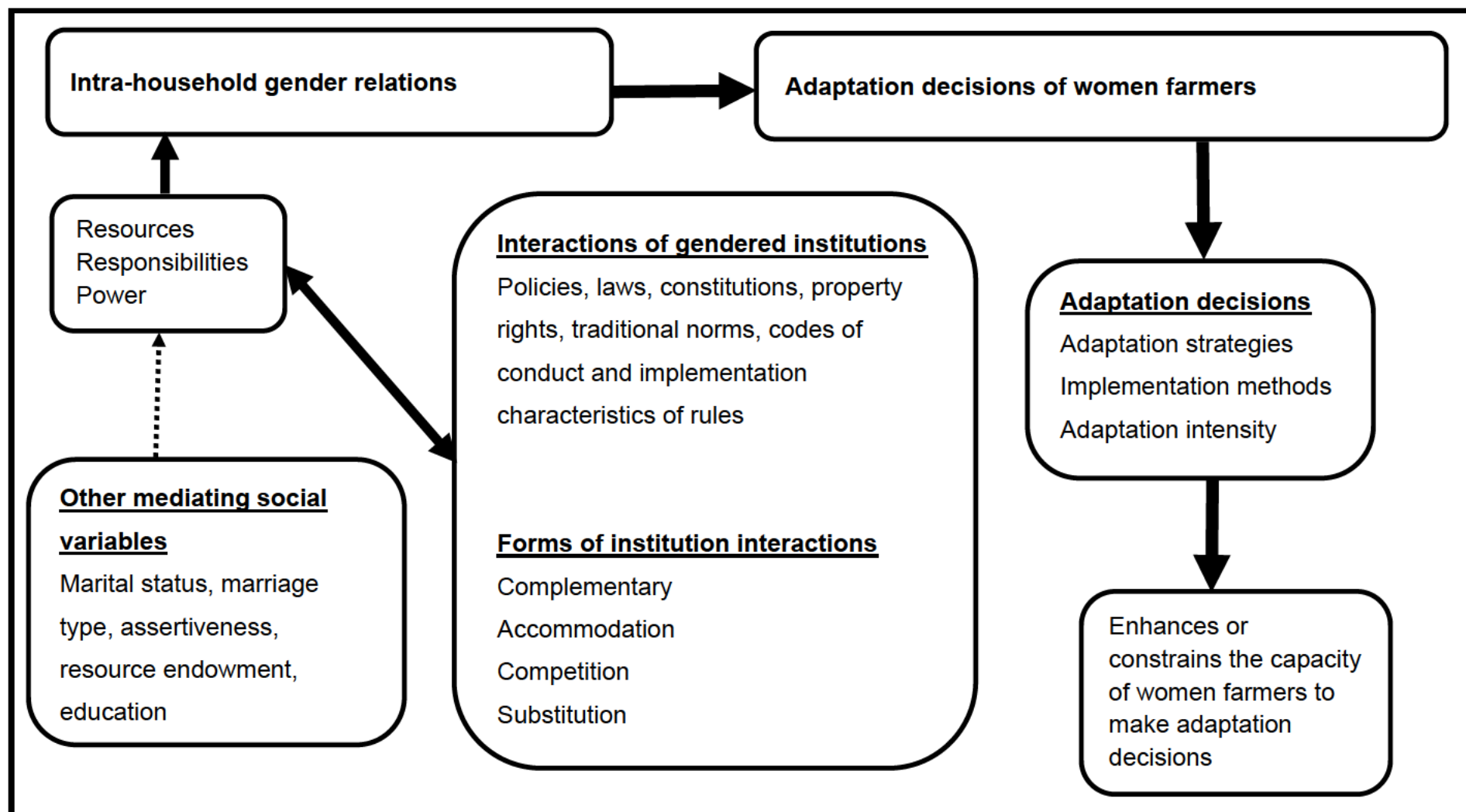
I examine how gendered institutions interplay with each other through execution of official and non-official rules and how these interactions construct gender power differences between female and male smallholder farmers. The ways through which gendered institutions interact with each other are explored in accordance with Helmke and Levitsky's (2004) categorisation of formal and informal institution interactions as complementary, accommodation, competition and substitutions discussed in-depth earlier (cf. section 3.3.3). Employing both FPE and SRA facilitates establishing how the interactions between gendered institutions interconnect with intra-household

gender relations and shape adaptation decisions of smallholder women farmers. To facilitate the analysis of the connections between intra-household gender relations, interactions of gendered institutions and adaptation decisions of smallholder women farmers, I crafted a conceptual framework discussed in the next section.

3.4.4 Conceptual framework

Guided largely by the literature review, FPE perspectives and complemented by SRA, the conceptual framework presented in this section guides analysis in my thesis. FPE perspectives inform analysis of the effects of the interrelationship between the interactions of gendered institutions and intra-household gender relations on adaptation decisions of women farmers. SRA guides analysis of the interactions of gendered institutions discussed with the guidance of Helmke and Levitsky's (2004) categorisation of formal and informal institution interactions. As evidenced in the literature, intra-household gender relations and institutions shape adaptation decisions of women. The conceptual framework (Figure 1) illustrates the theoretical linkages between key aspects that my study interrogates. These aspects are intra-household gender relations and adaptation decisions of smallholder women farmers. The mediating variable between the two above mentioned elements are the interactions of gendered institutions and their functional effect.

Figure 1: The Conceptual Framework



Source: Illustrated by the researcher (2022)

The conceptual framework (Figure 1) shows the conceptualisation of the interconnections between intra-household gender relations and the interactions between gendered institutions and how this interrelationship affects the adaptation decisions of smallholder women farmers. I postulate that when gendered institutions interact in ways that enhance gender equity in access and control over material and non-material resources such as land, climate information and adaptation knowledge, productive and reproductive responsibilities and power to determine priorities, the abilities of women to adopt available adaptation options and to effectively implement adaptation measures is improved. On the contrary, if the interactions between gendered institutions contribute to gender inequities in the above stated areas, women's capacities to decide to adapt to climate change is constrained. However, the extent to which adaptation decisions of women farmers are enhanced or inhibited by the interconnections between interactions of gendered institutions and intra-household gender relations also links to other social characteristics of smallholder women farmers.

3.5 Conclusion

This Chapter set out to review literature on climate change adaptation, intra-household gender relations, the interactions of gendered institutions and to establish existing gaps. The conceptualisation of major concepts in scholarship that relates to my study as well as their application in my thesis are explained. Overall, the literature review in this Chapter reveals gender asymmetries in climate change adaptation decision-making of farmers in smallholder agriculture with women's decisions noted as the most constrained in comparison to that of the men. Socio-cultural factors such as cultural norms appear to mostly construct and reconstruct gender inequities in resource access and control, division of responsibilities and power relations imposing

detrimental effects on the capacities of women to make adaptation decisions (e.g. Bikketi *et al.*, 2016).

Gender disparities in women's climate adaptation are stated to entwine with gender, other social variables and gendered institutions with customary rules shown to play a major role in configuring women's climate vulnerabilities and adaptation decisions (Ahmed *et al.*, 2016; Carr and Thompson, 2014; Rao *et al.*, 2019; Ravera *et al.*, 2016). Although the influences of gendered institutions on women's adaptation decisions are substantially highlighted in the literature, rarely are the interactions of gendered institutions, their interconnections with intra-household gender relations and effects on women's adaptation decisions interrogated in-depth. In institutional scholarship, studies seldom utilise a gender lens in their analysis of gendered institution interplay and adaptation decisions (Bremer *et al.*, 2021). In one of the studies that concentrates on gender, the interaction of gendered institutional actors is investigated to understand the factors that influence the development of gender-responsive climate adaptation policies (Mersha and van Laerhoven, 2019).

I also discuss perspectives central to gendered institution interactions, gender and climate change adaptation which foregrounds the theoretical framework of this study, FPE as the main theory complemented by SRA. FPE and SRA explain the interactions between gendered institutions and their interlinkage with intra-household gender relations and framing of women's adaptation decisions. These theoretical underpinnings guide collection of data and analysis of my study findings. A conceptual framework that collates the major analytical aspects and assumptions of my thesis has been crafted. The next Chapter discusses the methodology that I adopted in this thesis.

CHAPTER FOUR: RESEARCH DESIGN AND METHODOLOGY

4.0 Introduction

In this Chapter, I explain the research design and methodology that guided the interrogation of the research questions that my study set out to answer stated in Chapter one. This Chapter discusses the philosophical underpinnings of this study, research design, methods of data collection, analysis, ethical issues and researcher's positionality. In these discussions, I also account for the methodological choice of this study whilst recognising the strengths and inadequacies of the decisions undertaken. This Chapter is clustered in nine sections. Section 4.1 covers research philosophy, 4.2 research design, 4.3 methods of data collection, 4.4 sampling, 4.5 data analysis, 4.6 ethical issues, 4.7 positionality, 4.8 fieldwork reflections and 4.9 conclusion.

4.1 Research philosophy

Research philosophy refers to the assumptions about the nature of reality (ontology) and about what constitutes acceptable, valid and legitimate knowledge (epistemology) (Berryman, 2019; Burrell and Morgan, 2017; Merriam and Tisdell, 2015). Relatedly, research philosophy is also described as a system of beliefs and assumptions about the development of knowledge (Saunders, Thornhill and Lewis, 2019). Irrespective of whether or not researchers are conscious of these assumptions, they are noted to make various ontological and epistemological assumptions at different phases of their research (Creswell, 2007; Žukauskas, Vveinhardt and Andriukaitienė, 2018). This accounts for the significance of having a clear and coherent set of assumptions in order to undertake credible research. Drawing from these perspectives, I made philosophical assumptions to guide my choice of research design, research approach, methods of data collection, analysis and interpretation of results.

4.1.1 Ontology

Ontological assumptions aid researchers to become cognisant about the nature and the existence of what they are studying. Ontology is described as the assumptions that investigators make about the nature of reality and what exists (Richards, 2003). In research, there are two contrasting ontologies, objectivism and subjectivism (Bryman, 2015; Symon & Cassell, 2012). Objectivism argues that the social reality that researchers investigate is external and independent of them (Saunders, Thornhill and Lewis, 2019). In addition, the interpretations and experiences of researchers are noted not to influence the existence of the social world because it is composed of solid, granular and relatively unchanging 'things' such as social structures like family, religion and the economy (Burrell and Morgan, 2017). However, this perspective can be debated because it is challenging to investigate social structures and the issues therein such as gender relations and adaptation decision-making while upholding objectivism assumptions. Social issues by their nature entwine with value systems, beliefs, traditions, customs as well as other societal institutions. Therefore, investigating such issues may require ontological assumptions that permit unearthing such interlinkages and understanding how they function and shape the decisions that people make. This may explain why studies that predominantly rely on objectivism are natural science oriented. In some social science studies, that are conducted using quantitative methods, objectivism may be employed but this is not always the case.

Subjectivism provides alternative ways of understanding the nature of social reality which contradicts objectivism. It recognises two stances, nominalism and constructivism. Nominalism is considered the most extreme form of subjectivism because it explains that order, structures and social issues that researchers interrogate are created by them and other social actors through 'language, conceptual

categories, perceptions and consequent actions' (Saunders, Thornhill and Lewis, 2019, p. 137). For that reason, the social world is an attribution of social actors and this is influenced by their experiences and perspectives of reality. On the other hand, social constructivism is regarded a less extreme version of subjectivism. It notes that reality is constructed through social interaction which permits social actors to intersubjectively create reality through partially shared meanings (Bryman, 2015). This assumption of how social reality is created suggests that there are multiple realities as opposed to a single reality (Neuman *et al.*, 2013). Therefore, the understanding of such realities requires researchers to have an in-depth understanding of the context within which a study is being undertaken like the prevailing historical, geographical and socio-cultural situation. In this way, a more robust comprehension of the existing circumstances as well as how realities are being experienced will be gained.

Much as both objectivism and subjectivism can be applicable in understanding social reality, the most critical issue to consider is how best social reality can be investigated and understood. Is it when social entities are viewed as external and autonomous of social actors? Or when they are regarded as social constructs that are created from the perspectives of social actors? With these questions in mind, I adopted subjectivism ontology while taking a constructivism stance. Through this ontology, opinions and narratives that aided the understanding of the interconnections between intra-household gender relations and the interactions of gendered institutions and their influence on adaptation decisions of women farmers was gained. Constructivism permitted interactions with study participants and generation of multiple meanings from participants perspectives, experiences and actions about intra-household gender relations, gendered institutions that interact with each other and climate adaptation decisions. Since detaching myself from my values was challenging, I practiced

reflexivity, being conscious of and sensitive to my cultural, political and social context throughout my research (Bryman, 2015).

4.1.2 Epistemology

Epistemology refers to the assumptions that researchers make about the kind and nature of knowledge as well as how it can be acquired and communicated (Bryman, 2015; Richards, 2003; Cohen, Manion and Morrisson, 2007). It provides guidance to researchers on the factors they should take into account when producing knowledge (Neuman *et al.*, 2013). Since epistemology assumptions impose implications on the researcher's choice of methods and contribute to the quality of study results, it is pertinent to carefully think-through these assumptions before committing to any. Different epistemological stances such as positivism, critical realism, interpretivism, postmodernism and pragmatism guides researchers (Saunders, Thornhill and Lewis, 2019; Žukauskas, Vveinhardt and Andriukaitienė, 2018). Of these, the main divergent perspectives are positivism and interpretivism.

In positivism, reality is argued to exist and is observable, stable and measurable (Merriam and Tisdell, 2015). Positivists aim at unravelling accurate and factual data which explain causal relationships and produce law-like generalisations independent of human interpretations or biases (Berryman, 2019; Saunders, Thornhill and Lewis, 2019). Positivism corresponds more with studies that investigate social phenomena following objectivism principles. Nonetheless, it contradicts interpretivism which argues that 'human beings and their social worlds cannot be studied in the same way as physical phenomena (Saunders, Thornhill and Lewis, 2019, pp. 148-149). According to interpretivism, detailed insights into humanity can be lost when the social world with its complexity is expressed solely as a series of law-like generalisations

which are delinked from the interpretations of social actors (Creswell, 2007; Saunders, Lewis and Thornhill, 2012). This is because reality is perceived to be socially constructed from opinions, narratives and specific context of social actors (Merriam and Tisdell, 2015). However, interpretivism is criticised for generating results that rarely provide general interpretations of phenomena (Scotland, 2012). Its results are observed to be less generalisable since they are dependent on specific context, perspective and value (Saunders, Lewis and Thornhill, 2012).

Despite the above critique, interpretivism is asserted to enhance in-depth comprehension of issues investigated through generation and interpretation of qualitative data from which detailed insights and conclusions are drawn (Saunders, Thornhill and Lewis, 2019). This makes it peculiar from other epistemologies. In line with my ontological stance of constructivism, discussed earlier (cf. section 4.2.1), I adopted interpretivism as my epistemological position. This epistemology permitted interaction with participants and inference of meaning from them about the linkages between intra-household gender relations, gendered institutions and their interactions and women's adaptation decisions.

4.2 Research design

In this section I explain my research design (qualitative) and approach (case study). To provide an in-depth justification for my choices, I first explore different research designs available to investigators whilst mapping their strengths and limitations after which I explain my choice and its rationale.

Research design is a framework or set of methods and procedures which are utilised to generate and analyse data on a particular research problem (Johnson and Christensen, 2024; Ranganathan and Aggarwal, 2018). The choice of research design

is expected to be consistent with the ontological and epistemological lens of a study (Saunders, Thornhill and Lewis, 2019). There are different designs from which researchers select the most suitable for their inquiries. The traditional ones are quantitative and qualitative research designs (Bryman, 2015). Other than the two, there is mixed method where social science researchers combine qualitative and quantitative methods (Plano Clark, 2017; Timans, Wouters and Heilbron, 2019). However, the main contrasting designs are quantitative and qualitative.

4.2.1 Qualitative and Quantitative research

Quantitative research is descriptive, correlational, experimental and quasi-experimental (Swanson and Holton, 2005; Watson, 2015). It aims at testing theory and hypothesis or explaining phenomena using numeric data (Berryman, 2019). Such data is collected and analysed with the aid of statistical and graphical techniques (Saunders, Thornhill and Lewis, 2019). This design is noted to correspond more with the positivist paradigm (Creswell, 2009). In addition, it focuses on understanding causality, the relationship between variables (Denzin and Lincoln, 2005; Johnson and Christensen, 2024). But this has been criticised in some spheres. Demonstrating causality in social science research is stated to be challenging and that explains in part why most researchers establish relationships between variables rather than causality (Black, 2001; Tracy, 2024).

Moreover, the purpose for which researchers choose quantitative design also influences what they achieve from a study (Black, 2001). It is common for such researchers to aim at describing findings, establishing correlation or causality. In addition, considering that quantitative samples are usually large, investigators can generalise and replicate results which can be challenging in qualitative research

(Mcleod, 2008; Queirós, Faria and Almeida, 2017). Even though there are some concerns about which design works best – quantitative versus qualitative – scholars have transcended this binary narrative because all approaches, including quantitative research have some sort of drawbacks (Allwood, 2012; Black, 2001; Bryman, 2015; Creswell, 2009; Denzin and Lincoln, 2005; Johnson and Christensen, 2024). So, there is no design that is superior to the other. For instance, measurement inaccuracy, static description of results, lack of explanation, overlooking subjectivity and reflection on human submissions are some of the pitfalls of quantitative research (Bryman, 2015; Dehalwar and Sharma, 2024). Therefore, researchers are at liberty to decide whether or not to use quantitative design depending on what they deem the most appropriate for their studies such as qualitative research.

Qualitative design is one in which words and images (non-numeric) are used as data (Clarke and Braun (2013; Johnson and Christensen, 2024). Qualitative researchers seek to obtain evidence or gain deeper insights of opinions, attitudes, experiences, processes, behaviours or predictions of participants (Rowley, 2012; Tracy, 2024). This design is congruent with constructivist paradigm although qualitative researchers can draw from other philosophical stances such as critical realism and pragmatism (Creswell, 2009; Neuman *et al.*, 2013; Saunders, Thornhill and Lewis, 2019). Relatedly, researchers who use this design are stated to aim at understanding how people interpret their experiences, construct their world and attribute meaning (Merriam and Tisdell, 2015; Tracy, 2024). To achieve this, they use different approaches like ethnography, grounded theory, case study, phenomenology and narrative research and participatory research with case studies being more utilised (Berryman, 2019; Bryman, 2015). Just like quantitative design, qualitative research also has limitations. Exaggerated subjectivity, limited replication and generalisations

of results are reported as its shortfalls (Dehalwar and Sharma, 2024; Creswell, 2009; Neuman *et al.*, 2013). Conversely, its genres, features and strategies have been noted to supersede its shortfalls. The values of qualitative research such as generating detailed, rich and new perspectives which answer the 'why and how' of phenomena are emphasised (Jamshed, 2014 and Salmons, 2016; Tracy, 2024). Similarly, its relevance in exploring sensitive and socially dependent issues, complex social interactions and uncertain events like intra-household gender relations and climate adaptation decisions and gender relations is recognised (Sullivan and Sargeant, 2011).

The last design, mixed methods, integrates both quantitative and qualitative designs. In this approach, researchers employ both quantitative and qualitative methods to generate data within the same study (Creswell and Clark, 2014; Timans, Wouters and Heilbron, 2019). Combining methods, qualitative and quantitative, generates diverse perspectives and relationships that exist between issues being interrogated (Johnson and Christensen, 2024; Shorten and Smith, 2017; Timans, Wouters and Heilbron, 2019). Moreover, it is argued that integrated application of both quantitative and qualitative methods addresses the limitations and biases of relying on a single approach (Allwood, 2012; Johnson and Christensen, 2024). The limitations that mixed methods research moderates relates to the limitations of qualitative and quantitative research discussed previously. This in part rationalises mixed methods as an important research design and a complement to the traditional research designs (Johnson and Onwuegbuzie, 2004; Skamagki *et al.*, 2024). However, it is unreasonable to infer that this approach is perfect with no gaps. Even though qualitative data can be used to interpret quantitative findings within mixed method research as a way of gaining from the strength of both designs, there are limitations.

Overly diverse data and conflict in interpretation of results can compromise the benefits of employing mixed methods (Regnault *et al.*, 2018). That is why understanding alternative methodological stances and how they fit within the research context and philosophical perspectives of the researcher is pivotal in deciding what design to utilise.

Having noted that all research designs have strengths and weaknesses, it is pertinent to recognise that each approach is peculiar. They are oriented to achieve different purposes in research. For instance, quantitative design best suits studies which aim at describing events, establishing cause and effect relationships and generating numeric correlations. On the other hand, qualitative design is more appropriate for studies which focus on investigating why and how events occur as is the case in this research. It is for this reason that investigators are encouraged to assess the appropriateness of a design before choosing what to use (Bryman, 2015; Crossan, 2003). This assessment should not only focus on simplistic and narrow differences such as the kind of data generated, numeric data (quantitative) and non-numeric (qualitative) (Allwood, 2012). But it should concentrate on the specific context within which the study will be conducted, research questions, theoretical framing as well as practicalities such as access to participants, resources, study timing and sample size (Crossan, 2003; Saunders, Thornhill and Lewis, 2019). Much as distinguishing between research designs based on philosophical stances can be problematic as noted in some studies because there can be an overlap during implementation (e.g. Allwood, 2012), whatever design a researcher decides to employ requires consistent and coherent methodology. In correspondence with my philosophical stances constructivism and interpretivism and the nature of my study, understanding the interconnections between intra-household gender relations and the interactions of

gendered institutions and their influences on women's adaptation decisions, I adopted qualitative research design. This design was appropriate because it:

- i. supported contextualised and detailed examination of the research problem. I investigated how the interconnections between intra-household gender relations and interactions of gendered institutions enabled or constrained adaptation decision of women farmers guided majorly by FPE and complemented by SRA as explained in chapter one. More specifically, I questioned the relationships between females and males and other household members with respect to resource access and control, division of responsibilities and power to determine priorities, their linkages to the interactions of gendered institutions and effects on adaptation decisions of women farmers. These are sensitive and complex issues which are deeply ingrained within the socio-cultural systems of society. As a result, they are better interrogated and understood when participants sufficiently share their insights, experiences and opinions with the researcher (Bryman, 2015; Sullivan and Sargeant, 2011; Tracey, 2024). Therefore, I undertook qualitative research.
- ii. aligned well with the ontological and epistemological assumptions of my research (constructivism and interpretivism). Through an interactive and conversational process, detailed opinions, perspectives, observations, narratives and experiences of smallholder women farmers and key informants were elicited. From these, meaning and interpretation in connection to my research questions was drawn.
- iii. permitted the adoption of case study approach and the use of participatory data collection techniques that facilitated meaningful interactions and probing of

participants in relation to 'how' intra-household gender relations and gendered institutions enhance or constrain their abilities to make adaptation decisions.

4.2.2 Case study

Case study approach is described as undertaking empirical inquiry to investigate phenomenon in-depth and within its context (Gustafsson, 2017; Yin, 2018). The aspects that can be intensively studied as cases include a person, group of people or unit. Case study approach is also noted to permit the utilisation of several methods so as to comprehensively investigate social issues (Spinuzzi, 2023; Thomas, 2011). In social science inquiry, case study can be applied in a range of areas to explain, describe and explore social issues (Crowe *et al.*, 2011; Spinuzzi, 2023). Its versatility in terms of philosophy and methods permits generation of multiple evidence, contextualisation of research, investigation of complex issues, narrowing down broad fields into researchable topics and utilisation of theoretical propositions to guide data collection and analysis (Crowe *et al.*, 2011; Harrison *et al.*, 2017). It also allows researchers to gain detailed understanding of 'how' or 'why' of social phenomenon which can be quite challenging when using other strategies such as surveys (Crowe *et al.*, 2011; Yin, 2018). Therefore, understanding the nature of the research question is critical when deciding to adopt a case study approach (Harrison *et al.*, 2017).

The strength of case study does not imply that it is a method without flaws. Nonetheless, it is worth noting that its limitations are similar to those allied to qualitative studies (Hancock, Algozzine and Lim, 2021; Thummapol *et al.*, 2019). For instance, case study is noted to generate voluminous data which can be difficult to organise and analyse (Gustafsson, 2017; Hancock, Algozzine and Lim, 2021). In addition, generalisation of data is observed to be limited alongside concerns about rigour

(Crowe *et al.*, 2011). Despite these observations, I found the case study approach appropriate in answering my research question: how do the interconnections of intra-household gender relations and the interactions of gendered institutions influence adaptation decisions of smallholder women farmers in Uganda? This question required detailed and multifaceted examination in its real-life context. To gain a better understanding, I carefully identified relevant participants, smallholder women farmers and officials working on gender, climate change and agriculture at national, district and sub-county levels and two rural districts located in the lowlands and highlands of eastern Uganda. Moreover, the consistency of case study with constructivism, interpretivism and qualitative research also justified its appropriateness (Bryman, 2015; Symon & Cassell, 2012). To maintain rigour and to address limitations associated with case study and qualitative research more broadly, I purposefully selected information-rich participants as noted above, safely stored my research data and was consciously reflexive at all times (Crowe *et al.*, 2011; Patton, 2002; Thummapol *et al.*, 2019).

4.2.2.1 Case selection

Selection of cases can be based on a range of parameters such as the nature of research topic, existing literature and insights drawn from theory (Hancock, Algozzine and Lim, 2021; Stake, 1995). While identifying cases, commonalities and uniqueness may be considered although researchers seldom focus on commonalities (Crowe *et al.*, 2011; Stake, 1995). In most studies, cases are selected based on their uniqueness to permit detailed interrogation of the study problem (Crowe *et al.*, 2011). Further, case accessibility, cooperation, willingness of cases and risks associated with cases are considered when choosing cases. Nonetheless, researchers are encouraged to concentrate on cases that provide the opportunity to maximise learning based on their

research focus in a contextualised manner (Stake, 1995; Yin, 2018). This signifies that the purpose for undertaking a study should be reflected upon when choosing cases. In this way, cases that contribute to better understanding of the study can be selected. In the context of my research, I had the option of choosing other countries where women practice smallholder agriculture and adapt to climate change but this was not possible due to logistical and positionality concerns which I discuss later. It is based on this that I selected Uganda as an appropriate case for my study. Choosing Uganda as a case permitted me to take advantage of my positionality as discussed later (cf. section 4.7) to gain a thorough grasp of how the interrelationships between intra-household gender relations and the interactions of gendered institutions configure adaptation decisions of women farmers on the basis of participants experiences.

Uganda was appropriate because smallholder agriculture is widely practiced and more women than men work in this sector (NDP-III, 2020; UBOS, 2022). In addition, climatic events such as floods, landslides, droughts and other extreme weather events like thunderstorms, strong winds and hailstorms have been prevalent across the country in recent years (NPA, 2015; OXFAM, 2020). Climate change in Uganda and its effects has been explored in detail in Chapter two (cf. section 2.3). Moreover, rural communities in Uganda are traditional and patriarchal with value systems, beliefs and customs which shape familial relationships (Katungi, Edmeades and Smale, 2008; Theeuwes *et al.*, 2021). The aforementioned aspects are common across districts in Uganda and were useful in gaining greater comprehension of how intra-household gender relations enabled and constrained adaptation decisions of smallholder women farmers. Intra-household gender relations in Uganda was explored in detail in Chapter two (cf. section 2.2). Despite the above commonalities, farmers across Uganda live in different climatic zones with varied topographies (highland and lowlands) alongside

differentiated presence of natural resources like waterbodies (rivers, lakes, streams, wetlands), soils types (black, reddish, clayey, sandy, gravelly) and forests, which influence utilisation of different climate coping mechanisms (Kyebugola *et al.*, 2020). These variations also shape how smallholder women farmers peculiarly experience climate change.

Considering my financial and time limitations, it was difficult to undertake fieldwork in the whole of Uganda. So, I decided to undertake fieldwork in districts that provide a good balance in terms of the landscape, climatic zones, agricultural activities and natural resources. The reason for this was to gain in-depth understanding from different experiences and perspectives of smallholder women farmers representative of Uganda. Besides that, I also considered the accessibility of study sites, my networks, previous work, familiarity with the local language and possible cooperation from prospective participants when selecting field sites. Therefore, I purposefully selected two districts (Budaka and Kween), shown in Figure 1 below as my fieldwork sites because:

- i. Much as Budaka and Kween districts experience similar rainy seasons, with May to June identified as the wettest months, their average annual rainfall levels relatively contrast. Kween receives between 1,517mm to 2000mm average rainfall per annum which is relatively higher in comparison to Budaka which receives 1465mm per annum (*Geography | Budaka District*, no date; *Natural Resources | Kween District*, no date). This variance denotes a difference in the nature of climate risks such as drought, floods, landslides and thunderstorms and adaptation strategies implemented by women farmers. These variations uniquely shape women's climate experiences, observations,

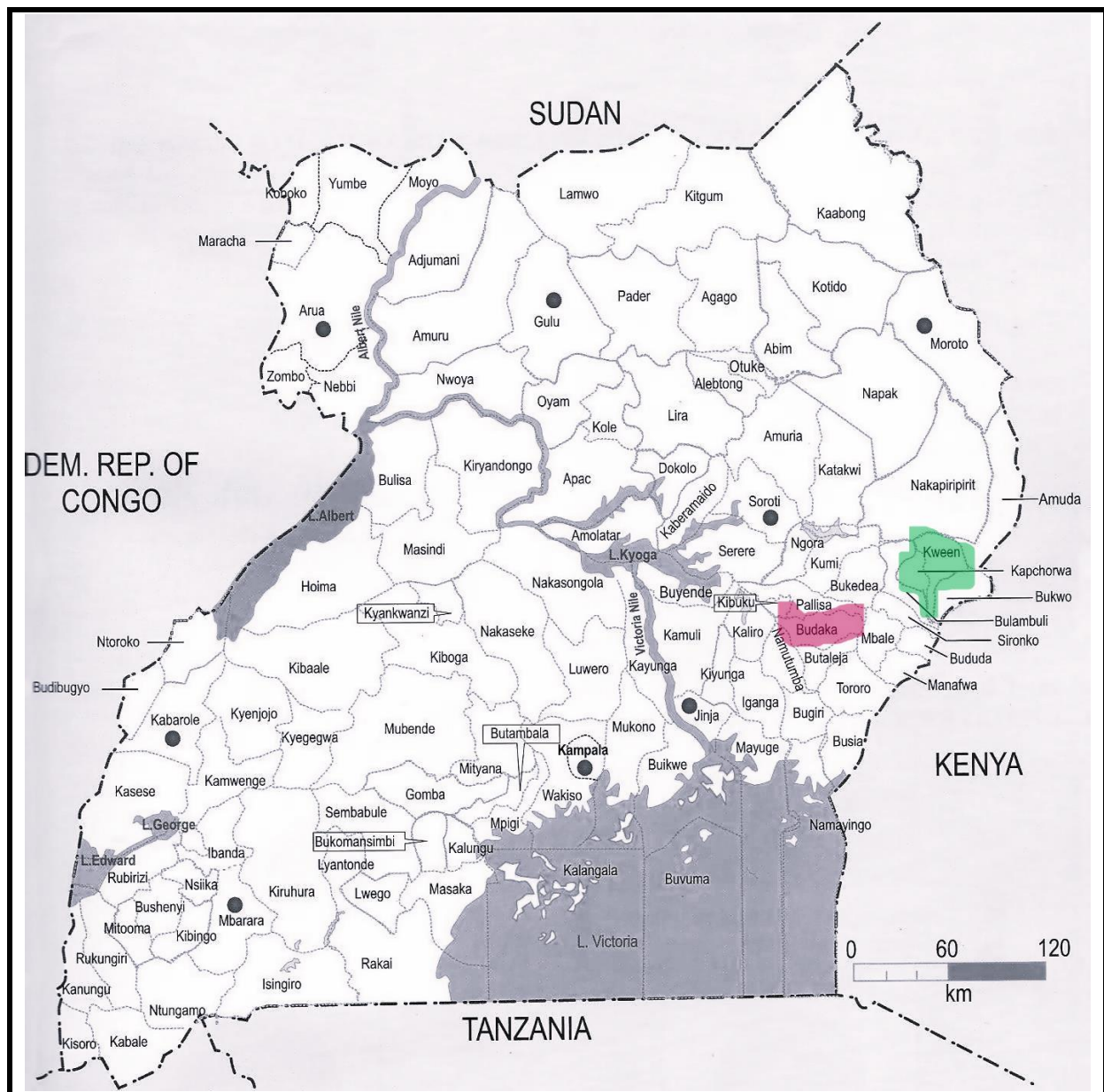
actions and opinions about intra-household gender relations and adaptation decision-making which they shared with me during fieldwork.

- ii. Considering that the greater part of Uganda consists of plateaus, there was need to carefully select areas with topographical differences and vegetative cover. The differences in the landscape, Kween consisting of three ecological zones (low, middle and highlands), with mountain-fed rivers and streams and Budaka being a lowland with wetlands permitted my study to unravel unique climate experiences and adaptation methods that smallholder women farmers employed. Some adaptation strategies that were prominently utilised in the lowlands differed from those employed in the highlands.
- iii. There are similarities and differences in the crops cultivated, animals reared and their purposes among women and men farmers in Budaka and Kween. Crops such as maize, cassava, potatoes, sweet potatoes, bananas, millet, groundnuts, sorghum, rice, wheat, barley, coffee, beans, cowpeas, vegetables (onions, cabbages, tomatoes) and watermelon are predominantly cultivated in the two districts (*Geography | Budaka District*, no date; *Natural Resources | Kween District*, no date). Among these, beans, cowpeas, cabbages, sweet potatoes, groundnuts, maize are cultivated by women farmers in both Budaka and Kween, majorly for subsistence. This differs from the majority of male farmers in the fieldwork area who cultivate the same crops mentioned above majorly for commercial purposes. In addition, men in Budaka commonly farm crops such as rice, watermelon and tomatoes for commercial purposes whilst in Kween, men farm wheat, barley, coffee and onions for sell. In terms of animals, cattle, goats, sheep are predominantly reared by men for commercial purposes whilst women mostly rear poultry for subsistence (Aggrey *et al.*, 2019;

UBOS, 2017). This gendered variation in the crops cultivated and animals reared by men and women farmers and their purpose contributed to the contextual and comprehensive understanding of women's adaptation decision-making experiences.

- iv. Since Uganda has diverse traditions, value systems, customs, norms and beliefs, Budaka and Kween were a good match. This is because they have quite different traditional practices although with similar cultural norms about gender. This was useful in comparing and contrasting intra-household gender relations and their linkages to adaptation decisions of smallholder women farmers.
- v. With respect to marriage type, monogamy and polygamy is practiced in both Budaka and Kween. However, polygamy is more practiced in Budaka than in Kween. Marriage type was significant in this study because it permitted the exploration of how equities and inequities in intra-household gender relations that shape adaptation decisions are uniquely constructed. Through this, variations in women's access and control over resources and adaptation decision-making autonomy was revealed. This contributed to a nuanced understanding of the linkages between intra-household gender relations and women's adaptation decision-making.
- vi. I have previously conducted research in districts bordering Kween and Budaka. So through the social networks that I had developed, I experienced minimal difficulties accessing the fieldwork sites and study participants. Besides that, I am also familiar with the local languages – Kupsabiny and Lugwere - as well as the social life in the study areas. This was useful when interacting with participants and also in contextualising their responses.

Figure 2: Map of Uganda showing the field work area



Source: Adopted from maps land (2012)

Field work area

- Kween
- Budaka

4.3 Methods of data collection

Qualitative participatory methods of research were adopted to collect empirical data.

These methods aligned with ontological and epistemological (constructivism and

interpretivism) framings of my research because I collected data through genuine and meaningful involvement of participants (Vaughn and Jacquez, 2020). My study relied more on primary data to gain thorough knowledge of the interlinkages between intra-household gender relations and the interactions of gendered institutions and their effects on adaptation decisions of women farmers. However, I integrated secondary data specifically to gain detailed understanding of gendered institutions. Therefore, I directly engaged with women farmers and staff working on gender and climate change adaptation at national, district and sub-county levels and also read policies, laws and reports in connection with gendered institutions. I discuss my study participants in the sampling section later (cf. section 4.4). I collected primary data using focus group discussions, gender disaggregated seasonal calendar, venn diagram, transect walk, semi-structured interviews and gender resource mapping.

4.3.1 Focus Group discussion

Focus group discussion is widely applied in qualitative research with the aim of gaining detailed understanding of social phenomena. It utilises a small group of participants who are purposely chosen to discuss a specific issue or topic to generate data (Wong, 2008; Nyumba *et al.*, 2018). The participatory nature of this method whereby study participants interact with the researcher and with fellow participants provide a good opportunity to understand participants perspectives, experiences, values and feelings about the topic under discussion (Casey and Krueger, 2014; Wong, 2008). To generate data that is relevant to the study, questions were carefully thought-through and sequenced in a way that was easy to understand and logical to the participants (Casey and Krueger, 2014). Moreover, there are also concerns about the number of participants that can engage in one focus group discussion and the number of focus group discussions that can generate sufficient data for a topic. Considering that small

numbers are quite easy to manage and all participants can be granted opportunity to contribute towards a discussion, it is generally agreed that between six to eight participants is an adequate number (Barbour, 2007; Casey and Krueger, 2014). With respect to the number of focus group discussions, a minimum of three to four focus group discussions are considered sufficient to explore a topic (Burrows & Kendall, 1997). However, this can further be influenced by the nature of research question and whether or not the researcher utilises other techniques of data collection to enhance the exhaustive discussion of the topic. For this research, other techniques of data collection were adopted alongside focus group discussions, that is why nine focus group discussions were held.

Even though my study utilised semi-structured interviews, as explained later (cf. section 4.4.5), there was need for focus group discussions so as to elicit common perspectives, multiple views and to broadly explore intra-household gender relations and women's adaptation decisions through interaction among participants and with the researcher (Gundumogula and Gundumogula, 2020; Thomas *et al.*, 1995). Through this method, women who were reluctant to share their perspectives and experiences were motivated to contribute more after seeing how fellow women farmers freely shared their views. This increased women's interest and willingness to participate in the one-on-one household interviews. Consequently, a total of nine focus group discussions were undertaken in this research in four parts. Four in Budaka with smallholder women farmers and five in Kween. Of the five that were conducted in Kween, four were with smallholder women farmers and one was with both male and female farmers. The initial plan of this research was to have only women participants but some male farmers, especially male headed household whose wives were participating in my research and clan heads participated in the first focus group

discussion that I held in Kween. A total of eight focus group discussions consisted of five women farmers each, whereas the one with both females and males consisted of 10 participants (six women and four men). On average, each focus group discussion lasted between 35 - 60 minutes and was recorded.

A set of open-ended questions were prepared to guide participants during the discussions (cf. appendix 7). Questions were structured in five sections and explored as four separate focus group discussion activities. The first section entailed general questions about farming, weather changes and life in the village. The second part focused on intra-household gender relations and adaptation challenges. A keen interest was in understanding dynamics around access, ownership and control of material and non-material resources. These two parts (first and second), were explored as one focus group discussion activity. In the third section, questions centered on gendered social groups, responsibilities and power relations. This formed the second focus group discussion activity. The fourth part that concentrated on changes in the climate across farming seasons, agricultural activities, climate change coping strategies, gendered responsibilities and life stresses were discussed as the third focus group discussion activity. Lastly, the fifth section paid attention to gendered institutions. This was explored through establishing agencies (institutional sites) that work with women farmers and scrutinising their rules. This was explored as the fourth focus group discussion activity. The focus group discussion activities were planned in this way to allow more time to discuss different themes in detail and also not to exhaust the participants. The general questions were useful in stimulating interaction and discussion. I led the discussions by asking questions and guiding the discussions as participants engaged. Since the groups were small (5 members each), everyone was

encouraged to participate. After others had contributed, quiet participants were also invited to share their thoughts at all times.

The focus group discussions were held at a venue agreed with the participants. The majority of women preferred holding discussion in a quiet place. In Budaka, women preferred being away from their homes to avoid distraction. As a result, they suggested a school venue would be appropriate. Upon reaching this consensus, the Local Council I chairperson and I had to seek permission from the school administration of Linghole primary school to allow us to use the school premises. Fortunately, this was granted. Similarly, in Kween, women preferred a quiet environment so they agreed that one participant would host the focus group discussion in her house. Hosts were identified in the two villages of fieldwork and they confirmed that they were happy with the arrangement. For that reason, the focus group discussions in Kween were mostly held indoors. I noticed that the venues played a considerable role in enhancing free and in-depth sharing of experiences. With respect to the time of meeting, participants suggested a convenient time. Since the first farming season had commenced and many had to go to the garden early in the morning, they preferred meeting from 12:00pm. To ensure good time keeping, team leaders were chosen and given the role of reminding members about the meeting thirty minutes before the scheduled time. Figure 3 below shows some of the focus group discussions that I undertook with women farmers.

Figure 3: Focus group discussions with smallholder women farmers



Source: Researcher (2022)

4.3.2 Transect Walk

After the first focus group discussion, a transect walk was undertaken with smallholder women farmers. Transect walk is a participatory method which is conducted with the objective of collecting data (Rojas, Nomedji and West, 2021). It involves walking around the village or community to collect data about land use patterns, available resources and the state of the environment (Lorenzo and Motau, 2014). This approach was adopted in this research to walk and see the landscape, land use patterns, crops grown, land that women cultivate, effects of extreme weather events on crops and land and the methods of farming implemented. One participant in each group volunteered to lead the walk. While walking with women farmers, I asked questions about the land that women cultivate, farming impediments, climate change related challenges that are predominantly experienced in the village and how farmers (male and female)

address them. I took note of the response provided as well as photographs of the landscape and gardens. A total of eight gardens were visited during the transect walk and this activity took between 15 to 30 minutes. Some of the pictures of the landscape and land, where women farm and crops is shown in Figure 4 below.

Figure 4: Gardens and landscape photographed during transect walk



Source: Researcher (2022)

4.3.3 Gender disaggregated seasonal calendar

The fourth activity of the focus group discussion was discussed with the guidance of gender disaggregated seasonal calendar. In this method, participants work as a team to create maps, graphs or resource lists which permits them to discuss gender responsibilities, agricultural and domestic activities and time over a particular day, week, month or farming season (Bhagawati *et al.*, 2017). In addition, researchers may pay attention to crops grown, crop importance, cropping activities and seasonal variations (Marimo *et al.*, 2021). Researchers can choose what to focus on depending

on the interest and purpose of their investigation. In my study, participants mentioned the months of the year and identified farming seasons across the year. Since they were smallholder women farmers who could not read and write, field assistants helped to write whatever they said in a table. I discuss field assistants and their role in my study later (cf. section 4.3.8). More attention was dedicated to understanding weather across months and changes in the climate therein, farming activities, life stresses and household responsibilities. The purpose of this was to exhaustively generate insights about climate variations across farming seasons, adaptation strategies, agricultural activities and responsibilities. Whilst using this method, months of the year and comments section were presented on the horizontal side of the table whereas farming activities, weather changes, life stresses and household responsibilities were on the vertical side. These were shaded over months of the year. Notes about how farming activities and household responsibilities were shared among household members (men, women and children) and how climate change and life stresses affected men, women and children were written in the comments section as illustrated in Figure 5.

Figure 5: Gender Disaggregated Seasonal calendar



Source: Researcher (2022)

4.3.4 Venn diagram

A Venn diagram was used to aid interactions with smallholder women farmers about gendered institutions and their interactions. This participatory approach to research is visual and can focus on different aspects such as institutions, people, social groups or natural resources. It involves using circles or other closed curves which depict how things are organized (Bulanov *et al.*, 2021). It can be utilised to visualise the significance of institutions or organisations in a community and participants view of the relevance of such institutions (*HECM 211: Venn diagram on institutions*, no date). Circles of different sizes are used to represent institutions with the bigger circle depicting more important and the smaller circles less significant institutions. Moreover, the distance between circles represents the degree of overlap and signifies the level of relationship and interaction (Bartel *et al.*, 2022; *HECM 211: Venn diagram on institutions*, no date). Large overlaps indicate close relationships and interactions while no overlap signifies distant relationships and less interactions.

In my research, Venn diagram technique was useful in identifying gendered institutions that work with and support women farmers. These were ranked according to their level of significance to the household using circles of different sizes. I commenced this discussion first by explaining what the activity involves and the different sizes of circles. The circles were in 3 sizes, large, medium and small. The most significant institutions were written on the large circles, moderately significant on the medium circles and less important on the small circles. After explaining this, participants were invited to identify all government and private gendered institutions such as programmes, regulations, groups and their rules and social networks that work with or support women farmers. These were written on paper as they mentioned one-by-one. After this, I asked them to discuss and identify which institutions they would present

on the large, medium and small circles. Since most of my participants could not read and write, field assistants helped with writing institutions on the circles while following the instructions of participants. When this was done, one large circle was used to represent a household and they were asked to place a different circle around the household depending on how they perceived their significance. So, members discussed and agreed on where each circle representing a gendered institution should be placed. Once this was agreed, one member volunteered to place the circle where it was agreed. At times when participants disagreed about where to place a circle, I would encourage them to share their perceptions with the rest of the members and also invite others to comment. By the time all this was done, they were able to decide where to place the circle. Figure 6 shows different gendered institutions identified by women participants and their interrelationships.

Figure 6: Venn diagram



Source: Researcher (2022)

However, other than sharing their experiences with institutional actors in relation to access to programmes that support women and agriculture, rarely were women farmers able to discuss specific institutional provisions that relates to gender relations and adaptation to climate change in detail. To bridge this gap, I interacted with selected

officials working on gender, agriculture and climate change at national, district and sub-county level and also reviewed policies, laws and reports in line with the gendered institutions identified by women farmers. Even though the key informants were more knowledgeable about institutions that relate to gender and adaptation to climate change than the women farmers, they did not provide detailed data to facilitate greater comprehension of gendered institutions and their interactions. In fact, some key informants encouraged me to read policies and reports to gain depth about certain information. Based on this, I used document review to collect secondary data in relation to gendered institutions discussed in detail later (cf. section 4.3.7).

4.3.5 Semi-structured interviews

This method utilises an interview schedule which comprises questions from different study themes presented in a particular order and with flexibility in questioning to allow probing and participants to freely express themselves in detail (Rowley, 2012). In semi-structured interviewing, each question may have sub-questions through which experiences, perspectives, values, processes and attitudes are explored with respect to a specific topic (DeJonckheere and Vaughn, 2019; Rowley, 2012). In my research, I designed an interview schedule comprising of open-ended questions which permitted deeper interrogation of intra-household gender relations, gendered institutions and adaptation decisions of women farmers. Despite the usefulness of semi-structured interviews in qualitative research, it requires interviewing knowledge and skills to obtain meaningful results (Ryan, Coughlan and Cronin, 2009; Rowley, 2012). This can be addressed through skillful questioning, conducting interviews in appropriate venues with very minimal distraction, listening attentively and practicing reflexivity at all times (Crowe *et al.*, 2011). My adoption of this method was informed by its flexibility and opportunity to utilise open-ended questions which permits generation of detailed and

meaningful insights through probing (Bryman, 2015; Weller *et al.*, 2018). This is consistent with my ontological and epistemological commitments and research design and approach discussed earlier (cf. section 4.1, 4.2).

I prepared four different sets of interview questions in this research (cf. Appendix 4, 5,6). Smallholder women farmers, agriculture officers, gender officers and climate change adaptation officers had separate sets of questions. Questions for women farmers were categorised into four. The first category focused on general issues such as life in the community, farming activities and climatic changes. The second category centered on gender with a specific focus on gendered access and control over material resources. The third category concentrated on women's access to non-material resources such as trainings and groups while the last section paid attention to gendered responsibilities, power and gendered institutions that work with women farmers.

The interview schedule for agricultural officers had three sections (cf. Appendix 5). Section one focused on general issues such as work experience in the department and general observations about agriculture and climate change. Issues pertaining to changes in the climate and climate adaptation were discussed in section two while intra-household gender relations and women's adaptation decisions were covered in section three. Similarly, the guide for gender officers was divided into sections with the first part focusing on broader issues such as what their work entails and their perspectives on relations between males and females in households. The last section focused on gender relations, gendered institutions that work with women farmers and how they cope with climatic risks. Lastly, the questions tailored to climate change adaptation officer at the Ministry of Water and Environment concentrated on their work

in the first instance and later focused on climate change and adaptation programmes with a focus on how programmes are delivered to smallholder women farmers. Interviews with key informants lasted between 30 - 40 minutes.

Interviews with women smallholder farmers were conducted in their households whereas those with the agricultural officers, gender officers and climate change adaptation officer at the Ministry of Water and Environment were held in their respective offices. Married smallholder women farmers had to inform their spouses of their participation in this research and also sought permission for the research team to visit them in their homesteads. Widows and divorced women who had elder sons also had to explain to them the purpose of our visit. In instances when this was not done, their sons would stick around and express discomfort about our presence non-verbally. After experiencing this in one household, I had to ensure that those with elder sons explain the purpose of the research before the interview day. Moreover, I was also available to answer their questions before commencing with interviews. Those who did not have elder sons did not have to seek any permission from any male. Those under this category were very few.

I conducted a total of 30 interviews. Of these, 25 were with smallholder women farmers with 13 in Budaka and 12 in Kween. Interviews that were undertaken with key informants were five in total. Two with district agricultural officers, two with district gender officers and one with climate change adaptation officer. All interviews were face-to-face and were held on a one-on-one basis with the participants. This arrangement provided more opportunity for free interaction and for the study participants to express themselves better. On average, each interview lasted between 40 - 60 minutes. For all the interviews, each participant was requested to identify the

most suitable time for them, which they all did. It was based on this that a schedule was drawn up and shared. Most women farmers preferred being visited between 11:30am to 4:00pm while the key informants were comfortable with interviews scheduled from 9:30 am to 12:00pm. After scheduling different interviews, participants were notified. To ensure that everyone attends, participants were reminded twice. The first reminder was a day before the scheduled meeting and the second reminder was made 2 hours before the actual time of the interview. Some of the interviews that I held with different women participants are shown on Figure 7.

Figure 7: Semi-structured interviews with smallholder women farmers



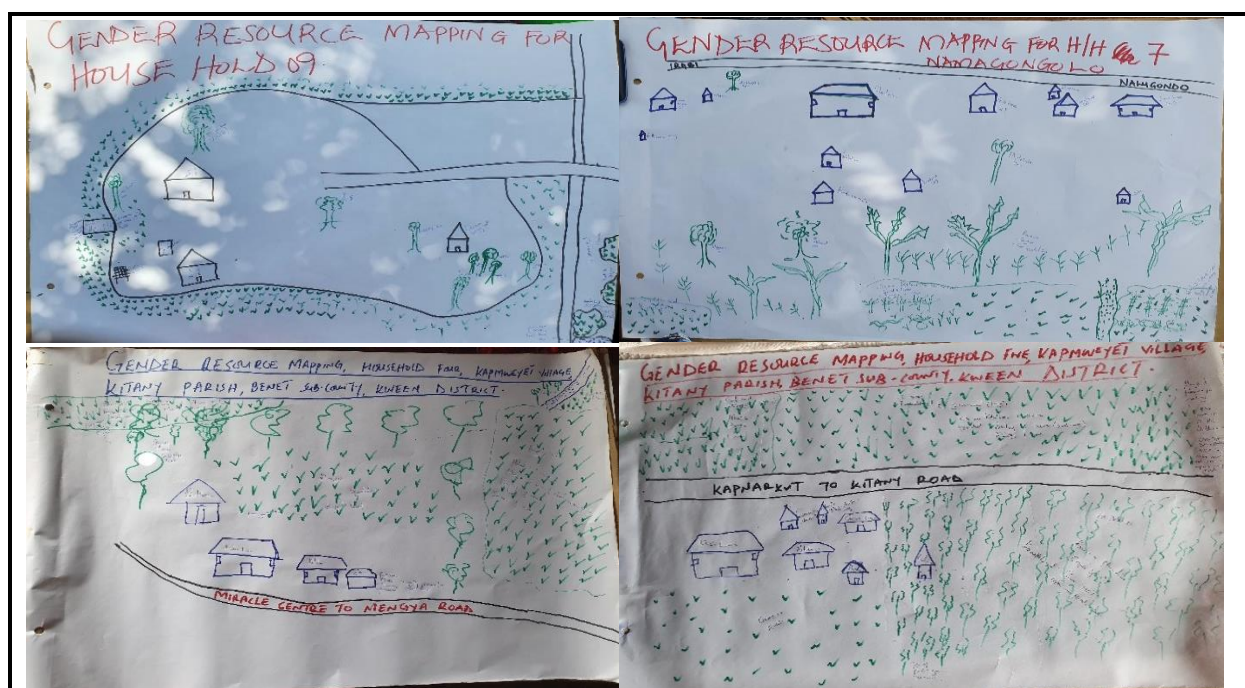
Source: Researcher (2022)

4.3.6 Gender resource mapping

To discuss and understand in detail the second category of questions that concerned gendered access and control over resources, division of responsibilities and power relations, I employed gender resource mapping during interviews with some smallholder women farmers. This technique of research is participatory and it uses pictures to represent farmers homestead, village or community (Mbile, DeGrande and Okon, 2003). It focuses on the landscape and physical features that are of interest to the researcher as well as how these features relate with other aspects within the

surrounding area. It may also show other descriptions that the researcher may note. This technique is appropriate in understanding gendered differences in space and place and is predominantly implemented in relation to the objectives of a study (Rocheleau, Thomas-Slayter and Edmunds, 1994). In my research, gender resource mapping guided conversations around themes such as what resources households have, those that women access and utilise and how decisions that pertain to utilisation of those resources are made. The interest of my research was to find out the land that females and males cultivate, crops grown, challenges that they face when cultivating on different pieces of land, ownership and control of land, crops, livestock and poultry, prevailing climate related challenges and how these have been addressed. Out of 30 interviews that were conducted, 15 were undertaken with the aid of gender resource mapping, nine with marriage women, five with widows and one with a divorced woman. Figure 8 shows some gender resource maps revealing homesteads, crops, surrounding vegetation, the land that women cultivate and shelters for animals.

Figure 8: Gender Resource Mapping



Source: Researcher (2022)

4.3.7 Document review

Document review is a method used to generate secondary data. It is described as a method through which documents are reviewed to make sense of and extract data (Kutsyuruba, 2023; Morgan, 2022). In line with my earlier observation about gaps in the empirical data collected in relation to gendered institutions and their interactions (cf. section 4.3.4), I reviewed documents after fieldwork with the aim of filling gaps related to details about the formal gendered institutions discussed by women farmers and key informants. In this regard, I reviewed Uganda's Land (Amendment) Act 2010, Succession Act 2000, Local Council Courts Act 2006, NAES principles, the rules of FTB and IFDC about how to access women's agricultural loans, agricultural inputs and training. These documents were accessed through the internet. A summary of the data collection methods that I employed are presented in Table 2 reflecting the type of method and the number of participants involved.

Table 2: Summary of data collection methods

Methods	Field site	Data type	No_ participants
<u>Focus Group Discussion</u> Gender disaggregated seasonal calendar, Venn diagram, Transect Walk	Budaka	Primary	30
	Kween	Primary	
<u>Semi-structured interviews</u> Semi-structured interview schedule Gender resource mapping	Budaka	Primary	25
	Kween	Primary	
<u>Key informant interviews</u> Agricultural officers, Gender officers Climate change adaptation officer	Budaka Kween Kampala	Primary	5
<u>Document review</u> Land (Amendment) Act 2010 Succession Act 2000, Local Council Courts Act 2006, FTB and IFDC rules	Internet	Secondary	N/A

Source: Researcher (2022)

4.3.8 Field Assistants

When undertaking fieldwork in a location where the researcher is not fluent in the local language(s) or totally familiar with the local environment, field assistants are valuable (Deane and Stevano, 2016). In the process of collecting data, there is considerable reliance on the assistance of local field assistants. They play an important role in translation, and their function occasionally extends to other elements of fieldwork like coordinating with study participants and planning meetings (Bujra, 2006; Deane and Stevano, 2016). When participants communicate in their native language and are translated, they gain confidence and are able to express themselves more freely (Kline *et al.*, 1980). In this context, it makes sense to work with field assistants who speak the local language as their first language, are conversant with the fieldwork site, have good listening skills, and can provide detailed reports on what is said (Bujra, 2006).

Notwithstanding my grasp of the fieldwork locations and familiarity with the local languages, I needed field assistants who were fluent in the local languages and more knowledgeable about the fieldwork sites. It is for this reason that I employed two field assistants to work in Budaka and Kween. Their primary responsibility was to translate during interviews and focus group discussions from the local languages (Lugwere and Kupsabiny) to English and from English to the local languages. They were also helpful in coordinating field activities with female farmers. The field assistants had a diploma as their minimum education of level, experience in translation and field assistant role and resided within the fieldwork area. I used my professional networks to recruit former students of Makerere University whom I called for a casual talk about the role. The first two that I contacted were fine with the position. So we scheduled our first in-person meeting to discuss the research and their duties. We arranged two additional meetings during this meeting to discuss ethics, fieldwork plans and data collection techniques

even though their primary responsibility was translation.

4.4 Sampling

Sampling is described as selecting part of the target population to participate in a study (Thompson, 2012; Uprichard, 2013). The different methods of sampling are categorised as probability and non-probability. In probability sampling, every member of the target population has equal chance of being included in a study whereas with non-probability, not all members in the target population have equal possibilities of being selected for research (Elfil and Negida, 2017; Wolf *et al.*, 2016). Probability techniques such as simple random, stratified, systematic and clustered are more applied in quantitative studies because they aim at large and representative samples, generalisation of results and gaining breadth understanding of social issues (Bryman, 2015; Patton, 2002). Much as probability techniques can be useful in qualitative investigations, qualitative researchers predominantly adopt non-probability techniques like purposive, convenience and snowball sampling (Bryman, 2015; Thompson, 2012). The argument for this is that non-probability purposely ensures that samples chosen are information-rich so as to permit comprehensive and in-depth understanding of the research problem (Gill, 2020; Hennink, Kaiser and Weber, 2019; Uprichard, 2013). This does not suppose that probability sampling does not consider knowledge of samples during selection but it draws attention to the different focus of sampling procedures which researchers have to bear in mind when choosing what to utilise. Since ontology and epistemology of research contributes to the choice of sampling approach, there is need to reflect on the nature of question and overarching purpose of the research when deciding what sampling approach to adopt. Besides that, it is fundamental for qualitative researchers to make use of sampling strategies which enhance rigour (Gill, 2020).

Informed by the above perspectives, I adopted purposive sampling. In this sampling approach, participants with knowledge relevant to a specified study are identified and selected to engage in research (Palinkas *et al.*, 2015; Patton, 2002). The selection of participants is also undertaken based on the judgement of the researcher (Black, 2009). Other than knowledge, researchers also focus on participants' availability and willingness to engage as well as their ability to share views and experiences (Bernard, 2017). Considering that my research focuses on smallholder women farmers, there was need to interact with women with different socio-economic backgrounds. The reason for this was to better understand how uniquely the interrelationships between intra-household gender relations and the interactions of gendered institutions shape their adaptation decisions. To maximise the diversity of women farmers, a heterogeneous sampling strategy was utilised (Flick, 2009). While using this technique, characteristics such as farm size, farming as full-time/part-time, education, membership in a farmers/self-help group, age, marital status and type of marriage was considered. Information such as marital status and farming as full-time/part-time work was accessed through the records of Local Council I (LCI) chairpersons. This was possible because whenever researchers are granted permission by the Chief Administrative Officers and sub-county chiefs to undertake fieldwork, it is acceptable for them to access information about prospective participants from the LCI chairpersons. With respect to information about farm size, education, type of marriage, membership in social groups and age, I relied on my initial interaction with prospective participants.

A total of 30 participants were selected for this research. 25 were smallholder women farmers and five were key informants (agricultural officers, gender officers and climate

change adaptation officer) who work with the government of Uganda. Smallholder women farmers were chosen because they directly engage in agriculture and have at least experienced climate change even though there may be differences in their perceptions and adaptation strategies. Besides, each of them live with household members, engaged in some sort of decision-making and have observed or experienced how females and males relate. Therefore, interacting with them was significant in generating information that was relevant to understand the dynamics of intra-household gender relations and how it shapes women's adaptation decisions.

For key informants, selection was based on their work and technical knowledge. Agricultural officers work directly with women farmers at district, sub-county and village level to equip them with knowledge and skills on how to enhance agricultural production and deal with different farming challenges such as those associated with climate change. In addition, they implement government agricultural policies, programmes and projects and also work with other private organisations working in the agriculture sector. This wealth of experience is useful in comprehending climate risks, its effects on male and female farmers, gendered institutions, climate decisions and adaptation strategies. Similarly, gender officers address gender issues that revolves around access, control and ownership of resources as well as gendered responsibilities and power relations from district to household level. Moreover, they also work closely with other organisations implementing gender related programmes. The experience and knowledge that they have gained in this way is relevant in understanding how women and men relate and how this contributes to the adaptation decisions that women farmers make. Lastly, climate change adaptation officer works at policy and programme development level. So, their technical insights backed by

experience was useful in gaining more understanding of how gender relations, gendered institutions and adaptation decisions are linked.

Smallholder women farmers were accessed indirectly through a 'gatekeeper'. The parish chiefs of the fieldwork areas put me in contact with LCI chairpersons who then linked me to women farmers. Through records of the chairpersons, I accessed addresses and contacts of the women and was able to identify and select potential participants. From this, a preference list was prepared based on marital status and involvement in farming on a full-time or part-time basis. After this, I contacted women with mobile phones through a phone call whereas those without phones were visited in their homes. It was during this preliminary interaction that I collected information about their farm size, marital status, marriage type, education level, membership in farmer or other self-help groups/associations and age. Most smallholder women farmers had either never attained any education or studied beyond primary six, engaged in agriculture fulltime and were married. Very few were divorced and widows. More women in Budaka belonged to self-help groups/associations than those of Kween. All women participants were above 18 years of age and most of them cultivated on small pieces of land except for a few widows and some women in polygamous marriages who were able to independently hire more land for cultivation.

For the agricultural, gender and climate change adaptation officers, I relied on my professional contacts and networks through which I accessed their contacts and addresses. Considering that fieldwork was undertaken in rural communities and most government employees do not reside there, there was need to get in touch with them via phone prior to visiting in-person to explain the purpose of the research, seek consent and schedule an interview. Moreover, having initial interaction before meeting

in-person was also important in building rapport. It is observed that having good contacts is critical in addressing the practicalities of conducting fieldwork in developing economies (Potter and Desai, 2006). So, my professional contacts and networks were very useful in enabling me to plan and meet appointments with government officials more effectively.

I stopped sampling when information saturation was attained. This principle is widely utilised in qualitative inquiries as it describes a situation when researchers do not find new information much as they continue interacting with participants (Saunders *et al.*, 2018). When I reached the 13th interview in Budaka and 12th interview in Kween, there was no new information being obtained so, sampling stopped. A summary of the social characteristics of the women participants that I interacted is presented in Table 3 showing their marital status, group membership, education level and the size of land that they cultivate individually or as a household.

Table 3: Women participants

Women farmers	Marital status	Group membership	Education	Farm size
Participant 1	Married	Saving and Credit group (Bagwere Tukulakulane)	Primary Three	½ acre
Participant 2	Divorced	Saving and Credit group	None	¼ acre
Participant 3	Married	Saving and Credit group (Tukola Basaka)	Primary Two	1½ acre
Participant 4	Married	Saving and Credit group Mairu group	Primary Six	1 acre
Participant 5	Married	Saving and Credit group (Namagongolo women's group)	Primary Six	2 acres
Participant 6	Widow	Saving and Credit group	None	½ acre
Participant 7	Widow	Saving and Credit group (Irabi Tukungane) Merry-go-round (Kasale)	None	½ acre

		Farmer group (Bataki Tulime) Burial group, Mairu group		
Participant 8	Widow	Saving and Credit group	None	1 acre
Participant 9	Married	Burial group (no name)	None	<1acre
Participant 10	Married	Saving and Credit group	Primary Three	<1 acre
Participant 11	Married	Saving and Credit group	Primary Seven	1 ½ acre
Participant 12	Married	Saving and credit association	Primary Two	<1acre
Participant 13	Married	No group membership	None	
Participant 14	Widow	Saving and Credit Association	None	1 acre
Participant 15	Married	Saving and Credit group (Chechac Satka)	Primary Two	1 ½ acre
Participant 16	Married	Saving and Credit association	Senior Four	1 acre
Participant 17	Married	Savings and Credit group (Tasti)	Primary Three	2 acres
Participant 18	Married	No group membership	Senior Four	½ acre
Participant 19	Married	Savings and Credit group		1 acre
Participant 20	Widow	Savings and Credit group (Sukut Multipurpose women's group) Market oriented group	Primary Three	1 ½ acre
Participant 21	Married	Savings and Lending Group	None	<1acre
Participant 22	Married	No group membership	Primary Three	½ acre
Participant 23	Widow	Parish model group	None	2 acres
Participant 24	Married	Savings and credit group	Primary One	<1acre
Participant 25	Widow	Parish model group	None	½ acre

Source: Researcher (2022)

4.5 Data Analysis

Qualitative data can be analysed using deductive or inductive approaches since they permit comprehensive analysis. However, to infer meaning from qualitative data,

researchers need to deeply immerse through reading and reflecting on data (Azungah, 2018, Braun and Clarke, 2006). This in part highlights the significance of carefully deciding what data analysis approaches to adopt while bearing in mind the methodology utilised. When conducting deductive analysis, pre-existing framework or theory comprising of themes is used during analysis (Bihi, 2024; Kyngäs and Kaakinen, 2020). This implies that codes are predetermined since they are drawn from existing theory and not from data. For inductive analysis, themes are drawn from data and not theory (Azungah, 2018; Kyngäs and Kaakinen, 2020; Thomas, 2006). When analysing data inductively, themes are identified from data and that is why they are considered to have a strong link to data (Patton, 1990; Thomas, 2006). This does not suppose that inductive analysis is conducted in an epistemology and ontology vacuum. Researchers who adopt this approach can also use theories or frameworks to guide analysis. However, themes are not fixed to fit within pre-existing theory as it is the case with deductive analysis (Bihi, 2024; Patton, 1990). In correspondence with the ontology and epistemology of this study, there was need to utilise an approach that permits free capturing of perspectives and experiences of smallholder women farmers about intra-household gender relations and adaptation strategies. For that reason, data was analysed inductively while utilising thematic analysis and with the aid of NVivo software. In this approach, analysis was undertaken following emergent themes from the data (Braun and Clarke, 2012; Burnard *et al.*, 2008; Lathlean, 2010).

For the empirical data, which was the main data type for this study, audio recordings from interviews were transcribed verbatim, word for word with some edits on the grammar and elimination of pauses, sighs and laughter from the excerpt. This approach to verbatim transcription is recognised as useful in extracting meaning from transcripts in qualitative research (Halcomb and Davidson, 2006; Loubere, 2017). I

transcribed the interviews by myself with the aim of becoming more intimately immersed in the data. In this way, I became more cognisant of interesting results broadly. I then uploaded my data onto NVivo and did a word frequency and text search to identify initial patterns in the data and insights to guide my generation of codes. After this, I generated codes and keenly read through the transcripts line by line to apply the right codes such as gender and land access, groups and membership, evidence of climate change, gender and climate adaptation strategies, men's and women's agricultural activities, division of domestic chores, decision-making power among others. Whilst coding the excerpts, I kept revising my codes and creating new ones whenever necessary. I then grouped the codes into themes guided by my research questions. In a similar way to the codes, I kept revising my themes whilst collating the codes. The main themes that I generated were resource access and control, gender responsibilities, decision-making power, gendered institutions, services of gendered institutions, interactions of gendered institutions, changes in the climate, climate change experiences and adaptation to climate change. I later revised these into three major themes in correspondence with my research questions. So my main themes were intra-household gender relations, gendered institutions and their interactions and climate change adaptation decisions. With these themes, I then commenced writing my narrative.

Guided majorly by FPE perspectives, my analysis and interpretation of results focused on revealing the interrelationships between the interactions of gendered institutions and intra-household gender relations and their effects on men's and women's access and control over resources, division of responsibilities and power relations. I also showed how the interlinkages between interactions of gendered institutions and intra-household gender relations enabled and constrained the capacities of women farmers

to make adaptation decisions. In the analysis of interactions of gendered institutions, I disclosed how gendered institutions interplay with each other on the basis of official and non-official routinised practices and how this interplay constructs power differences between women and men farmers. This analysis was complemented by SRA perspectives and the different ways through which gendered institutions interact was discussed in line with Helmke and Levitsky's (2012) categorisation of institution interactions.

With respect to secondary data that complemented the understanding of interactions of gendered institutions (cf. section 4.3.7), I undertook manual analysis. I carefully read through legislation related to domestic relations (Land, Succession and Local Council Courts Acts) and regulations of FTB and IFDC on access to agricultural credit, implements and trainings. I scrutinised specific rules that relates to gender relations, interactions with other institutions and climate adaptation. I made summaries about the above and integrated the findings in the empirical discussions.

4.6 Ethics

Ethical approval was obtained from the Humanities and Social Sciences ethical review committee of University of Birmingham. A participant information sheet was given to study participants to make available all relevant information about the research. This document contained information about the purpose of this research, field activities that participants were part of such as focus group discussions, interviews and transect walks. It also detailed the amount of time participants would spend on each activity and the options available for them to withdraw from the research without being penalised. Participants were permitted to withdraw within the period of fieldwork and two weeks after fieldwork. The risks of participating in this research were very minimal

and the benefits were also explained in the project information sheet. Considering that issues pertaining to gender access and control over resources, responsibilities and power relations are somewhat sensitive to discuss in rural societies, I assured participants of confidentiality and anonymity. Information collected from participants and about them were kept strictly confidential only to be accessed by the researcher and field assistants. It was also explained that they will not be identified in any reports or publications and their data will not be stored in an identifiable format. Instead of using participant's name, I assigned them numbers allowing only myself to identify their data (cf. Table 3). The numbers with names were stored in lockable cabinet only accessed by the researcher.

Participant information sheet was translated to Lugwere and Kupsabiny to enhance its understanding by all participants. However, I noted that most smallholder women farmers could not read and write even their own local language. So, with the help of field assistants, the participant information sheet was read and explained to them verbally using the local language. After this, they were given an opportunity to ask questions and seek clarification. Moreover, participants were encouraged to discuss with others before deciding whether or not to be involved in the study. When all this was done and they felt fully aware of the project, their consent was sought.

Study participants were asked to consent to voluntary participation and liberty to withdraw from the commencement of fieldwork up to two weeks after its conclusion. Upon withdrawal, their data was to be deleted from the study and destroyed. In addition, participants consented to their data being processed in accordance with the University of Birmingham Code of Practice for Research and Data Protection Act 2018. Interviewees also consented to their photographs, that of their gardens and

homesteads being taken and used in different publications, voices being recorded during interviews and focus group discussions and, that they are above 18 years of age and are happy to participate in the research. Consent from participants who could read and write such as agricultural officers, gender officers and climate change adaptation officers was obtained in written by signing consent forms. For smallholder women farmers, consent was obtained verbally and recorded by them appending their thumb print onto the consent form. Verbal consent was sought from women farmers each time they participated in any field activity even though they had taken part in previous activities for which consent had been given.

It was also my ethical obligation to inform participants how results from this research will be utilised. I explained that these results will be used to write my PhD thesis and results will also be presented in research conferences and seminars, publication in academic journals and discussions in formal and informal fora. It was further noted that at a later time, policy and research briefs may be designed so as to solicit discussion, learning and action on women's adaptation to climate change. Most interviewees were impressed upon learning about how their results were to be utilised and were enthused to participate more actively.

4.8 Implications of researcher's positionality

To understand better how the interconnections between intra-household gender relations and the interactions of gendered institutions enable or constrain adaptation decisions of women framers, fieldwork was undertaken in Uganda as noted previously (cf. section 4.2.2). I am a Ugandan national who has lived in rural communities for more than twenty-five years. I went to a rural school in Uganda for primary and secondary education. In addition, my university education both bachelor's and

master's degree were in Uganda. During my first field placement as an undergraduate student, I worked with women farmers in Eastern Uganda. My duties and responsibilities involved monitoring performance of farmer groups and also supporting them to mitigate farming challenges by using different farming practices. I executed these responsibilities alongside a team of agricultural officers and other senior staff from Soroti Catholic Diocese Development Organisation. In the course of my work, most women shared their personal difficulties in accessing resources like hoes, pesticides, manure, climate information, agricultural credit, training opportunities and how this has affected their ability to productively engage in agriculture. From this, I became more cognisant about the complexities of women's engagement in agriculture although I had previously made some observations about women's limitations in farming.

From the time I graduated with a first degree, I have been working with education institutions in different parts of Uganda. This has continued to provide opportunity for me to learn more about risks farmers face across Uganda, value systems and traditions. For instance, upon finishing my first degree, I worked as an administrative assistant in the dean of students' office at a rural institution in Uganda (Kumi University). This role permitted me to interact with both female and male parents and students who shared the challenges they face in paying tuition fees. Most challenges revolved around poor agricultural outputs, conflict about resources and responsibilities in households. While teaching at Makerere University (my most recent job), I supervised rural field attachment in different parts of Uganda. Most students under this attachment focus on studying farming challenges, climate responses, public and private interventions to livelihood challenges, implications of government and non-governmental programmes on rural livelihoods, gendered access to resources and

services, domestic violence and child neglect. Whilst reading through their work and offering guidance, I realised that the major issues that impact wellbeing in rural areas are centered around agricultural production, resources and social relations.

Besides that, I have also previously engaged in research in Uganda that focused on people's access to land and water, gendered access to micro credit, climate change, food security, sustainable livelihoods and farming methods. Through these studies, I became more acquainted with and aware of the complicated farming-related challenges that women confront, and I have been intrigued to investigate these issues further. Moreover, I also gained skills, experience and confidence of conducting interviews, focus group discussions and application of participatory techniques of research like gender disaggregated seasonal calendar, gender resource mapping, transect walk and Venn diagram. During my earlier research to understand the problems that rural people experience in accessing land and water in one of the communities in Budaka, participants mistook us for government agents looking to take their land. Due to this, even after we explained the goal of our research, they were unpleasant, impolite, and uncooperative. Despite their negative attitude, we remained calm, finished the meeting, and left in peace. This experience served as a point of reference during fieldwork since I remained calm at all times, despite some participants asking provocative questions and having people who had not been invited join focus group discussions.

My past research also allowed me to create ties and networks that were useful during fieldwork. I had earlier met with the Parish Chief and the Local Council I chairpersons of Budaka. So, after obtaining permission from the Chief Administrative Officer to conduct fieldwork, the sub-county chief welcomed me and offered all the assistance I

required, just as the grassroot leaders. For example, records of women farmers (names and contacts) were easily accessible. This simplified the identification and selection of women farmers, as well as their access and it was easy for them to trust me with their information. To build rapport, I would welcome people in Lugwere language during field activities and occasionally use terms from the local language during our interactions.

In the instance of Kween, my life experience, ability to speak the local language (Kupsabiny), professional and social networks allowed easy access to participants and a high degree of trust. Despite having a field assistant whose function included translation, I had to clarify certain things in the local language during interviews and focus group sessions to improve understanding. Participants felt comfortable with me and expressed themselves freely whenever they heard me speak their language while being aware that I belong to a different ethnic tribe. In most focus group discussions, women participants encouraged each other to share their personal experiences and perspectives citing that I am (the researcher) one of them and my research could publicise their challenges and solicit interventions.

Despite the above usefulness of my positionality, I was also cognisant of the risks of drawing from my experiences, gender, values and personal biases when interacting and interpreting data. So I practiced reflexivity at all times when interacting and interpreting the experiences and perspectives of participants.

Besides that, as an educated female and a non-native in the communities where I conducted fieldwork, some men were quite uncomfortable with me interacting with their female counterparts. I discuss this subtle resistance from some men and how I addressed it later (cf. section 4.9). Moreover, some women were quite hesitant sharing

their real life experiences with me during our initial interactions. But as I engaged with them in more field activities and interacted informally during transect walks, they gained more trust in me and shared their life experiences with much ease.

4.9 Fieldwork reflection

In this section, I discuss my field experiences and how I addressed the challenges that I encountered during data collection.

Fieldwork activities

Fieldwork was undertaken in the rural districts of Budaka and Kween. Women were contacted in their homes during sample selection and were enthusiastic in participating in this study. However, married women, who made up the majority of study participants, expressed concern about engaging in interviews and focus group discussions without their husbands knowledge or approval. To address this, I encouraged them to explain the goal of the research and obtain spousal approval for them to participate in this study, which they did. For spouses who were dissatisfied with their wives' explanations, I was invited to elaborate on the goal of the study. This worked effectively since the males became more cooperative and did not interrupt their spouses during interviews as some did in the past.

When widowed farmers were approached, the majority of them agreed to take part in the study. Because the interviews were conducted in households, I inquired as to whether their family members would be okay with my presence. They stated that because they do not have husbands, they are free to make their own decisions and choose what activities to engage in. As a result, there would be no issues, they added. However, after my first conversation with a widowed woman farmer, I discovered that this was not the case. Her adult son was bothered by my visit and his mother's

interaction with me. So he lingered to hear our talk and, most likely, the type of questions posed to the mother. This affected the interviewee's capacity to freely express herself and relate her experiences thus lowering the quality of her responses. So I had to interrupt the interview and first explain the goal of the research to the participant's son before allowing him to ask questions, which were all answered. Even though I did not ask him to leave the interview, he stayed for less than five minutes before asking to go. Therefore, for the remainder of the interviews, I explained the goal of the research to all adult household members, particularly men who seemed curious about what the women were involved in or exhibited discomfort.

Interviews with agricultural, gender and climate change adaptation officers were held individually in their offices. Prior to the interview, the purpose of the research was explained and they were fine being interviewed. They freely shared their experiences and perceptions based on their work and community life. According to my observation, their positive response was motivated by the fact that the research aligned well with their work and they found it useful in contributing policy development and practice which aim at enhancing climate response and the welfare of women farmers. In addition, agricultural and gender officers noted that this research provided them the opportunity to reflect more on climate and gender related challenges that women farmers face and the possible strategies of addressing them.

So as to moderate my personal bias, participant's narratives were recorded as they spoke during interviews and interpretation was based on these narrative. During focus group discussions, I took notes but also recorded voices so as to ensure I do not interpret results following my own opinions considering that I am a female Ugandan national. After completing each field activity, I would stay in the fieldwork site for about

thirty minutes interacting informally with participants, community leaders and other women who were not part of the research. The aim for this was to counter check the responses that I received during interviews.

Fieldwork period

Fieldwork was undertaken during the first farming season in Uganda (March – June). This period was appropriate because women were able to share their most recent experiences about resource access and control, household responsibilities, power relations, climate change, decision-making and adaptation as well as corroborate them with the past ones. However, it presented a challenge. Most women farmers were not available to engage in field activities before 12:00pm as they were engaged in their gardens most mornings. As a remedy, I requested them to suggest the appropriate time to meet and, afternoon (anytime between 12:00pm – 5:00pm) was preferred by the majority. Much as this was agreed, rarely did they keep time. So, I had to be very flexible with respect to time throughout the fieldwork period. I recall on two occasions in Budaka and Kween, I had to carry forward some focus group discussions and interviews because participants came late. It would rain in the afternoons in Kween, making the roads inaccessible. So I was always prepared to change my schedule based on the weather, and the women were fine with it. When it started pouring, I would ask to end the interview and continue with the activities the next day, which most women agreed to.

Working with local languages (Lugwere and Kupsabiny)

Considering the significance of conducting interviews in the local language and the inability of most rural women to speak English, there was need to translate interviews and focus group discussions to the local languages (Lugwere and Kupsabiny). To

achieve this, I worked with two field assistants (one in Budaka and another in Kween) to help with translations. Field assistants have been previously discussed in detail (cf. section 4.3.8). The translations worked well but it was time consuming and sometimes difficult to translate some words directly to the local language because they do not have exact matches, were unfamiliar or expressed differently in the local language. Besides that, there were times when the field assistants would not translate exactly what I have said. So, I would caution them to translate exactly what I have said. For the case of Kween, I would sometimes conduct interviews in Kupsabiny because I can speak it but for Budaka, I kept encouraging the field assistant to interpret exactly what I mentioned.

4.9 Conclusion

In this Chapter, the procedures that I followed to answer my research questions have been discussed. I provide justifications for my methodological decisions. The study research design, qualitative and case study approach, aligns with the philosophical commitments (constructivism and interpretivism), participatory data collection methods and thematic data analysis approach of this study. This research approach was appropriate to interrogate my research questions. The exploration of the research questions is undertaken in the following Chapters.

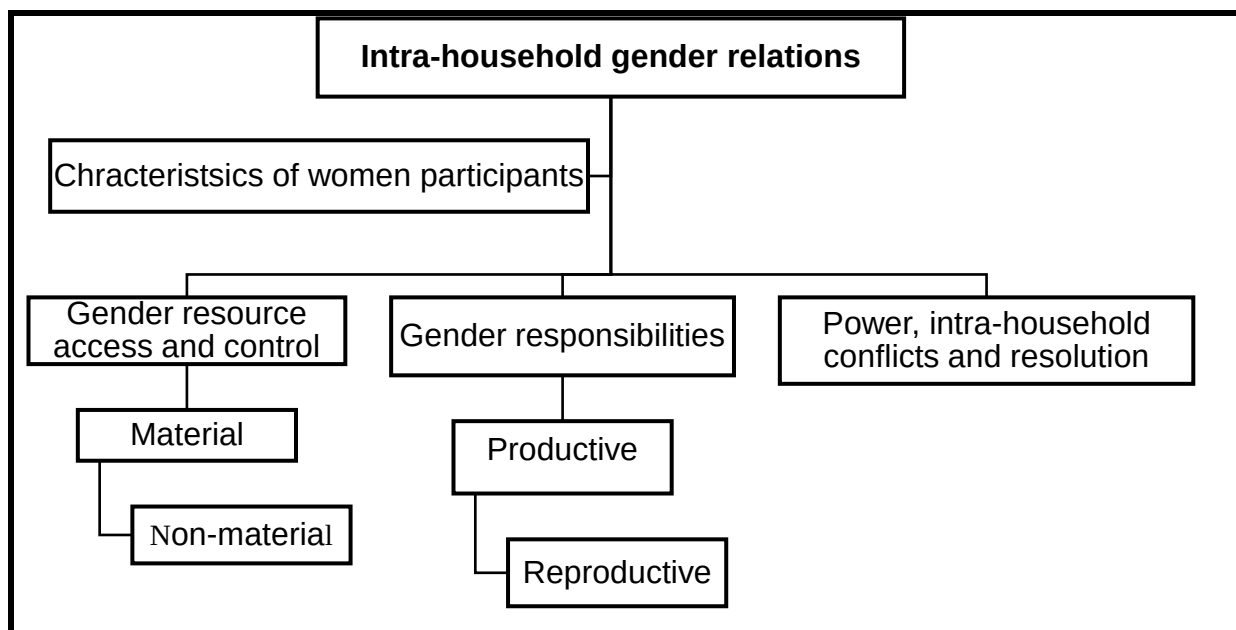
CHAPTER FIVE: INTRA-HOUSEHOLD GENDER RELATIONS

5.0 Introduction

This Chapter concentrates on understanding intra-household gender relations as the context within which smallholder women farmers experience climate change and make adaptation decisions. Informed by the literature reviewed on gendered climate adaptation and FPE perspectives discussed in Chapter three, analysis concentrates on how household members relate to each other with respect to resources, responsibilities, and power. More specifically, the Chapter focuses on how household members access material and non-material resources and who controls and determines resource utilisation in households. With respect to gender responsibilities, I reveal productive and reproductive responsibilities in households and discuss the divisions of these responsibilities among household members (men, women and children). In relation to power, the central focus is on power relations among household members, how decisions are undertaken and their linkage to conflicts in households.

In the examination of all these aspects – resources, responsibilities and power – I unravel gender equities and inequities that smallholder women farmers confront in households and show their potential implications for adaptation decision-making of women. In my discussions, I also draw attention to gendered institutional influences on intra-household gender relations because household members relate within plural gendered institutional contexts. To contextualise my analysis, I first explain the characteristics of the women participants in my study. The aspects I explain, marital status, type of marriage, children (sons and daughters) and household headship, form a crucial part of my analysis. The different sections of this Chapter are summarised in Figure 9 below illustrating the Chapter layout.

Figure 9: Structure of Chapter Five



Source: Researcher's illustration (2023)

The first section centres on the characteristics of study participants which are reflected in the ensuing discussions. This is followed by discussions on how material and non-material resources are accessed and controlled by household members. In the second section, the division of productive and reproductive gender responsibilities of household members are explored. The last section covers power relations, conflicts and their resolutions in households.

5.1 Characteristics of women participants

The participants in my study were mostly smallholder women farmers from different but not significantly contrasting ethnic backgrounds. Among the study participants, 17 (68 percent) were married, seven (28 percent) were widowed and one (four percent) was divorced women. All the women (married, widowed and divorced) had both sons and daughters. 15 (60 percent) of the married women were in monogamous marriages whilst two (eight percent) were in polygamous marriages. 17 (68 percent) of women participants live in male headed households while eight (32 percent) were female

household heads. Two (eight percent) of the women were members of the LCI executive. Most widows had both male and female children and continued to inhabit their matrimonial homes taking charge of animals and other resources left by their deceased spouses in cases where there were any. Despite retaining access to family land, many widows experienced conflicts with their deceased husbands' relatives or certain clan leaders who sought to grab their land or claimed a portion for farming. This differed from the experience of the divorced woman in the sample who had one male child and mainly cultivated on co-owned or hired land. Women practice agriculture in the dry land, wetland and riverbanks but dry land farming was the most pronounced. Women farmers cultivate different crops and rear some animals mainly for subsistence (cf. section 4.2.2).

5.2 Gender resource access and control

In this section, I discuss gendered access and control over critical material and non-material resources that facilitate climate adaptation. The material resources established as relevant to women's adaptation to climate change are land, animals (cattle, goats, sheep and poultry), farm implements and inputs (hand hoes, ox-ploughs, sprayer pumps, fertilizers, pesticides and improved seeds) and credit. With regards to non-material resources, agricultural training, climate information and savings and lending groups are discussed.

5.1.1 Material resources

Land

Informed by customary rules and practices, land is traditionally demarcated to the men. It was found that land is traditionally referred to as *men's heritage*. Therefore, the right to own and control land is culturally reserved for men. Although women's

inheritance of customary land is acknowledged, no evidence of women's inheritance was revealed. This implies that women's access to land is inhibited by traditional norms and that changes concerning women's inheritance of customary land is occurring gradually. This corresponds with FPE's perspectives on the role of de facto arrangements such as cultural norms that restrict women's inheritance and control over land and in determining men's and women's property rights (Rocheleau *et al.*, 1996).

In the majority of households, married and widowed women practice agriculture on customary land owned by male household heads and acquired through inheritance or purchase. This differs from the divorced woman who relies on hired and land co-owned with her son. In cases where land is purchased in male-headed households using family resources to which women contribute, the land still belongs to male household heads. In a similar way as married women, most widows cultivate on their deceased husband's land. Widows also occasionally farm on hired land similar to married women who sometimes cultivate on land hired by their men partners. Among the married women, one woman in a polygamous marriage hired land differing from those in monogamous marriages who hardly hired land independently. In polygamous marriages, hiring of land is linked to the relative autonomy of women in decision-making. Across households, married women were found to have more access to different land for farming such as wetlands that are owned and hired by their male partners than divorced and widowed women. However, this rarely translated into married women controlling the land that they farm. This relates to the assertion that married women access lowlands and highlands for farming more than female household heads (Van Aelst and Holvoet, 2016). The relative autonomy that married women such as those in polygamous marriages have to make decisions relates to the

liberty with which women whose spouses work far away determine some family priorities (Sell and Minot, 2018; Quisumbing and Doss, 2021).

In line with eliciting greater liberty to access and control land, the majority of women prefer hiring or purchasing land (individually or jointly) for farming other than farming on customary land owned by men partners. But men's restriction on women's access to land, financial limitations, lack of spousal support, conflicts associated with co-owning land and high costs of purchasing and hiring land were found to undermine women's realisation of this desired liberty. In the fieldwork area, hiring one acre of land for two farming seasons costs between Uganda shillings 200,000 - 500,000 (\$53.79 - \$134.49). These costs are similar to those of hiring land in other parts of Uganda which ranges between Uganda shillings 300,000 - 800,000 (\$80.69 - \$215.17 (*Land for Commercial Agriculture in Uganda Greening Uganda*, no date). In terms of land purchase, joint purchase with adult son was the only evidenced and most reported among divorced women than individual purchase. However, land purchase by women was uncommon across households.

Despite women rarely purchasing land, participants strongly support women purchasing land jointly with adult sons. This form of land purchase is perceived to safeguard against the risk of land being grabbed by some male relatives and neighbours. But still, participants disclosed conflicts between mothers and sons that emerged when sons claim exclusive user rights over the land. A divorced woman who co-owns land with her adult son expressed her experience in this quote:

Sometimes my son wants to independently decide on what to cultivate on our land. Even when I make suggestions, he opposes me and we argue (Interviewee 2).

This quote demonstrates conflicts in households which emanate from variations in the farming interests of male and female household members. Such conflicts coupled with financial limitations and gender norms shrink women's land ownership prospects. In this way, women's dependence on customary land and decision-making hinderances are augmented. This substantiates previous observations concerning smallholder farmers including women strongly depending on inherited customary land for agriculture (Adem, Namatovu and Farrelly, 2022; Lawson *et al.*, 2020).

In male-headed households, household heads allocate women land for farming. Women are apportioned small pieces of land that is sandy, rocky and in hilly areas and is difficult to till. Male household heads commonly reserve fertile land in the wetland and riverbanks for themselves to hire or farm crops primarily for commercial reasons even during the dry season. Sometimes, male household heads hire out land without the knowledge of their female partners. This illustrates impediments to women's access and control over land. In correspondence with previous studies, men are noted to apportion themselves fertile land and women poor quality land to cultivate (Bikketi *et al.*, 2016; Pérez *et al.*, 2014). In households that practice agriculture in the wetland, women have to fulfil certain conditions in order to gain authorisation to access the wetland. Some of the conditions that women meet are disclosed:

A woman has to offer to weed crops of the household head in order to gain permission to plant anything in the wetland (FGD 3).

Subjecting women to fulfilling conditions set by male household heads to access productive land such as wetlands as reported in the above quote, depicts gender asymmetries in power and control over resources. It further reveals barriers to married women's determination of their own agricultural activities which relatively differs from the experiences of female household heads.

Widows and divorced women have some control over land although their power is not exclusive. The divorced woman with purchased co-owned land undertook joint decisions about land utilisation with her adult son. This diverges from the case of widows whose decisions to utilise customary land involves adult sons in households with sons, relatives of the deceased spouses and clan. The relatives of deceased male spouses and the clan are responsible for dividing land among orphaned sons. They also allocate widows land for cultivation and authorise land hiring although it is uncommon for widows request to hire out land to be approved. This shows some disparities in female household head's control over land with divorced women possessing more control than widows due to limited involvement of relatives and clan. Although the involvement of relatives of deceased husbands in land matters is commonly antagonistic, the intervention of the clan sometimes culminates into peace and harmony. This is associated with clan leaders being impartial and seeking to fulfil the traditional mandate of the clan which pertains safeguarding harmony and stability in female-headed households. However, this is not always the case as most clan leaders implicitly support the relatives of deceased men spouses in claiming land in female-headed households. This complicates widows' control over land reinforcing earlier arguments about widows and single women farmers having less control over land (Lawson, 2020). But these results show variations between widows and divorced women with divorced women possessing greater control over land.

The unfairness commonly exhibited by relatives of deceased men partners and clan towards women associates with gender norms that discriminate against women controlling land and individual personalities of clan leaders. A participant explained the problem she faced with her deceased husband's relatives and clan in this quote:

I had so much trouble with my husband's family and clan after his death. They came to my house, beat me, and asked me and my children to leave their land but I refused. I told them to kill me with all my children before they can take over our land (Participant 23).

The extract shows the abuse that widows endure from the relatives of their deceased spouses and the clan's shortfall in their mandate to safeguard female-headed households. This downplays women's control over land in the absence of male household heads.

The antagonism caused by men's relatives and the clan in female-headed households was stated to vary depending on the presence of children, age, sex, assets left by deceased spouses and women's assertiveness to claim and defend their land rights. Female household heads who firmly defended their land rights to the extent of seeking legal support from the state and civil societies when their land rights are abused and women with adult sons were less antagonised. On the contrary, women who hardly claim and defend their land rights, have only daughters or young sons face greater antagonism. Although young boys are traditionally valued, some widows rarely accessed and controlled land on this account in some households except in cases where clan leaders are impartial as noted earlier. Much as widows in my study sample had children, the plight of widows without children was reported. Results show that widows without children were popularly ill-treated by relatives of deceased husbands and are restricted from accessing customary land despite their age and the period of time that they have been married to their deceased husband. The younger widows sometimes accessed customary land on the account of re-marrying a close relative to their deceased husband.

In accordance with customary rules, widows are commonly asked to re-marry a brother of their deceased husband in order to continue inhabiting her matrimonial home and cultivating on the family land. But this depended on their age. Younger widows have greater opportunities to re-marry within the family and retain their land access and other property rights than older widows. In Lugwere culture, just as it is the case with Sabiny culture, it is a custom for widows to be inherited by the brothers of their deceased husbands. This is linked to the traditional practice of paying bride price which renders wives to be perceived as family property that has been purchased through the payment of bride price. Much as this custom is not forcefully implemented like it used to be about three decades ago, some widows consent to re-marry to retain their land access rights. The widows who decline re-marriage sought help from state or private agencies to defend their land access and other property rights. Those who found the pressure to re-marry a close relative to their deceased spouse unbearable eventually decided to leave or to re-marry elsewhere, and to a man of their choice. Widows solicitation of the intervention of state or private agencies align with the argument that people subjugated by customary systems seek assistance from national laws (Fischer *et al.*, 2021). But this may not be obvious for women whose behaviours are influenced by traditional norms as discussed in the literature (cf. section 3.2.2). Some women find it difficult to seek external intervention in connection with claiming and defending their land rights due to the consequences such actions may impose on family relations. It is for these reasons in part that some African feminist scholars recognise women's reliance on negotiations with family members and compromise to secure their land access and other property rights (Arrey-Ngang, 2020; Nnaemeka, 2004).

Animals and poultry

The common animals owned by household members are cattle, goats, sheep and poultry. Of these animals, male household heads prominently owned cattle, goats and sheep whilst women mostly owned poultry. Some widows own cattle, goats and sheep. These widows are those with some control over land. Widows ownership of the above stated animals was also influenced by the factors that configure their control over land discussed in the previous section that centres on land. It was uncommon for married women to own animals except poultry although some control animal products such as milk (yields 1-3 litres per day per cow) and eggs similar to some female household heads. In cases where the milk produced is above five litres, male household heads were involved in determining how the milk is utilised. Male household heads required their women partners to address myriad of family welfare needs such as food, medical and scholastic materials through the sale of animal products. Married women largely complied with this requirement in order to sustain their access and control over animal products. Expending earnings from animal products to address welfare needs resonates with widows utilisation of animal products. However, the variation is that whilst widows independently determine their expenditures, the expenditures of married women are mostly dictated upon by men partners. This provides more evidence to male household head's ownership and control over resources in consonance with scholarship (cf. section 3.2.1).

High economic value animals – cattle, goats and sheep – are of interest to male household heads more than poultry. As a result, poultry is predominantly owned by women with most women owning between five to seven birds on average. These birds normally reproduce and increase in number over time and are recognised as a boost

to women's welfare. The birds are stated to improve women's ability to fulfil their gender responsibilities discussed in detail in the next section (5.1.2). To illustrate the significance of poultry keeping to women's welfare, a participant stated that:

I have some birds that are of great help. When we lack food, I sell one at about Uganda shillings 7000 (\$1.88) and buy maize flour (Participant 21).

The excerpt reveals the centrality of poultry keeping to women's daily struggles for survival despite the low economic value of poultry. Women's improved wellbeing can therefore be associated with their involvement in productive activities such as poultry farming and their power to determine how proceeds from their productive activities are utilised. In support, previous studies acknowledge the connection between women's engagement in agriculture and their empowerment but then correlate women's constrained realisation of empowerment to their subjugation and exploitation majorly by the men (De Brauw, Kramer and Murphy, 2021; Tavenner *et al.*, 2019). This contradicts the situation of female household heads who have more liberty to engage in poultry keeping and decide how to utilise their proceeds. It further reveals the role of power dynamics in determining women's gain from productive activities.

Some women sought to improve their economic gains from poultry and modulate associated risks of poultry disease by exchanging birds for goats. In my fieldwork area, between seven to fifteen birds were commonly exchanged for one goat depending on their sizes. This aligns with women's prioritisation of their survival by consciously making decisions that safeguard their survival as asserted in FPE perspectives (Elmhirst, 2015; Rocheleau *et al.*, 1996). However, even though some female household heads safeguarded their livelihoods in this way, the majority of married women did not. Whilst widows own and control the goats, married women lost the control of their goats to male household heads on the basis of being *household heads*.

This inhibits the ability of married women to autonomously decide to utilise the goats to address their welfare needs. This corresponds with the cultural gendering of responsibilities that present men as controllers of household assets (Angula and Menjono, 2014; Niemann *et al.*, 2024; Tambulasi, Mkwambisi and Kamoto, 2021). The loss of ownership and control over goats informed married women's reluctance in exchanging birds for goats even though they lost many birds to disease.

Related to other household resources, married women seek authorisation from male household heads to sell or cook the birds for food despite having some control over the birds. This deviates from the experiences of female household heads who have the power to decide whether to cook or sell their birds. But still it was uncommon for male household heads to decline women's requests. The decisions of male household heads to grant the request of women partners aligned with the traditional perception that regards chicken as women's property in line with evidence in the literature (Bikketi *et al.*, 2016; Ngigi, Mueller and Birner, 2017). Besides that, it was described as a norm for male household heads also to receive a fraction of earnings from the sale of birds in recognition of their *headship*. So, granting the requests of women partners is beneficial to male household heads. Apportioning male household heads a fraction of earnings from birds served to maintain familial harmony. Despite this exemplifying married women's limitations in diversifying livelihood sources and making autonomous decisions, it solicited space for married women to negotiate future decisions including climate adaptation. Complying with conditions set by male household heads is recognised in African feminist scholarship as creative ways through which women navigate culturally induced inequities and secure spaces for negotiating their decisions such as adaptation to climate change (Arrey-Ngang, 2020; Gatwiri and Mumbi, 2020; Kwarazuka, Locke and Seeley, 2019).

Farm implements and inputs

The main implements that smallholder women farmers employ are hand hoes with a few using ox-ploughs. Hand hoes are accessible to women due to its low cost, centrality to women's agricultural activities and the traditional perception of owning a hand hoe symbolising a *hardworking woman*. A few widows and married women whose men partners own oxen, large farmland, income to meet the cost of ox-ploughing and supportive male adults (sons or spouses) who hired or drove oxen had access to ox-ploughs. In cases where women access oxen and ploughing equipment, the work of ploughing is undertaken by male partners, relatives or hired male labour. Despite most women preferring ox-ploughs to hand hoes because ox-ploughs are less labour intensive, limited financial capacities and the nature of land that most women farm (small land sizes located in hilly areas) as discussed in the earlier paragraphs curtail women's reliance on ox-ploughs. This illustrates women's prominent dependence on hand hoes for core agricultural activities such as tilling land, planting, weeding, and harvesting as noted in previous research (Murray *et al.*, 2016). Reliance on hand hoes illustrates women practicing agriculture in laborious ways and using traditional tools. It also reveals women's inability to implement adaptation strategies that require improved tools. These adaptation measures include spraying crops against pests and diseases and irrigation (Kristjanson *et al.*, 2017).

Some agricultural tools are less accessed by women although the majority expressed a strong desire to employ them. These tools are sprinklers used to irrigate crops and sprayer pumps for spraying crops against pests and diseases. Sprinklers are mostly desired by women who farm in the wetlands and along riverbanks either independently or jointly with male partners. On the other hand, interest in sprayer pumps cut across the majority of women. In contrast to male household heads, the majority of women

had limited access to sprinklers and sprayer pumps. A few widows and married women whose men partners own sprinklers, sprayer pumps or were financially able to hire the stated tools, employed them. Rarely did the divorced woman use these tools due to low income levels.

Similar to women's constrained access to sprinklers and sprayer pumps is limited access to fertilizers, improved seed varieties and pesticides. Of these inputs, fertilizers and improved seed varieties are widely underutilised. Some married women who intercropped vegetables with crops of male household heads accessed to fertilizers when men applied it on their crops. Whereas fertilizers and improved seed varieties were underutilised, the majority of women access pesticides although in differing quantities and quality in comparison to their male counterparts. This wide access is linked to a high incidence of pests and diseases and their devastating effects on agricultural outputs. Due to financial encumbrances and limited access to sprayer pumps, most women only purchase pesticides proportionate to their income. For example, if a woman has Uganda shillings 1000 (\$0.26), it was reported that she only purchases pesticides worth that amount and sprayed crops using hand-made brooms due to limited access to sprayer pumps as discussed earlier. There are minimal variations in the way married, divorced and widowed women accessed and utilised pesticides except for a few widows who farmed on relatively large pieces of land, owned sprayer pumps or could afford to hire and are able to purchase the right pesticides. This reveals gender inequities in resource access and situates financial constraints as a major determinant to women's access to farm implements and inputs (Badstue *et al.*, 2020; Tambulasi, Mkwambisi and Kamoto, 2021). Women's financial constraints and limited access to improved farm inputs and implements are associated with hinderances in accessing credit. These hinderances are linked to lack of

collateral, approval and support from men partners in consonance with the observations in the literature (Khandekar *et al.*, 2019; Ngigi, Mueller and Birner, 2017; Quisumbing and Pandolfelli, 2010). Consequently, majority of women depend on informal savings and lending groups for credit as discussed in the next section.

5.1.2. Non-material resources

Related to the earlier discussions (cf. section 5.1.1), this section explores gendered access to agricultural training, climate information and savings and lending groups as critical non-material resources that facilitate adaptation to climate change. This exploration discloses gender symmetries and asymmetries in women's access and control of the above resources and their implications for women's adaptation decision-making.

Agricultural training and climate information

Agricultural training and climate information is available to both female and male household members. But interviews with key informants and women participants showed that male household heads had better access than women. This variance associates with differences in state and private agencies delivery of trainings and information. State agencies (sub-counties) and a few private agencies, IFDC are noted as the main providers of agricultural trainings and climate information. IFDC, through its commitment to deliver agricultural technologies, practices and building capacities of farmers, aims at sustaining food security and agricultural production ('About Us – IFDC', no date). The training that IFDC provides is similar to that which sub-counties deliver through agricultural extension officers such as agronomic practices, post-harvest handling and soil management practices. Additionally, both sub-counties and IFDC are noted to provide high-yielding seeds, improved animal breeds and fertilizers

which farmers access at no cost or on a loan basis. However, whilst access to the above agricultural inputs from the sub-county is at no cost, those offered by IFDC is on a loan basis repaid at the end of the farming season. IFDC is stated to assess the ability of farmers to repay the loan by establishing their land size and apportioning repayments across farming seasons. The apportioning of repayments is undertaken in consideration of climate uncertainties and potential effects of climate uncertainties on agricultural outputs. Despite male household heads having better access to IFDC's services, married, widowed and divorced women were found to access IFDC's services more than those that sub-counties provide.

Women's access to IFDC's training and information is influenced by IFDC targeting both female and male farmers, adequately circulating training information to community members through radio, megaphones and local leaders and the timings of the training which is largely between 3:00pm and 5:00pm. These times are reported as suitable for women because they normally complete their morning chores before 3:00pm and concluding the training at 5:00pm gives them adequate time to return home to undertake evening domestic chores. Besides that, women were also found to demonstrate trust and confidence in accessing and employing knowledge and skills gained from IFDC due to its transparency and the competence exhibited by the trainers. This illustrates the linkage between gender-sensitive institutions and the realisation of gender symmetries among household members such as in climate adaptation decision-making (Ampaire *et al.*, 2020; Perelli *et al.*, 2024; Peterman, 2011). However, the findings above do not signify that women accessed all services provided by IFDC. Gender inequities in accessing certain services is disclosed. For instance, it is uncommon for the majority of women to access high-yielding seeds and fertilizers due to low financial gains from agriculture, small farming land and restrictions

from men partners. This differs from training and information provided by IFDC for which women's access was relatively higher in comparison to those provided by sub-counties. Women's limited access to agricultural training and information provided by sub-counties associate with training mainly targeting progressive farmers. Progressive farmers are farmers who demonstrate past success in earning income from agriculture (Leo, 2008). Targeting progressive farmers was based on the presumption that when progressive farmers — who are largely men — gain knowledge and skills, they share it with other farmers in their communities.

Key informants stated that progressive farmers are majorly selected on the basis of their farming success. Factors such as the size of land that a farmer cultivates (one acre and above), literacy (ability to read and write) and agricultural outputs are the basis for identifying progressive farmers. Even though some training targeted other farmers such as women despite their previous earnings from agriculture, the majority of women rarely attend except women in leadership. Women who hold leadership positions in the LCI were found to attend certain trainings on the basis of their leadership responsibilities and in cases where it was mandatory for women representatives to participate. This illustrates resource access variations among women and discloses social variables that construct inequities among women farmers apart from gender (Arora-Jonsson, 2011; Rao *et al.*, 2019).

The limitations of gender sensitive rules to enhance women's participation in training and access to information that sub-counties deliver is linked to varied factors. Participants reported that factors such as poor delivery of information, design of training programmes, individual gender biases and corrupt agricultural extension officers undermined women's access to the above stated resources. Women farmers

further explained that corrupt officials took bribes from beneficiaries and prioritised their friends and relatives (mostly men) especially during delivery of improved seeds and animals. Moreover, women farmers also reported that the restriction of male household heads to their mobility and domestic responsibilities complicated their participation in training and access to information provided by sub-counties and IFDC. The traditional gender division of labour disadvantages women and advantages men by domesticating women with no restrictions on men's mobility (cf. section 3.2.2). Through this, gender inequities in access to weather forecasts (onset and cessation of rainfall), floods and drought warnings recognised as one of the drawbacks to women's agricultural production in rural Africa are exacerbated (Aryal *et al.*, 2022; Assefa and Gebrehiwot, 2023; Belay *et al.*, 2017). The limiting effects of traditional gender norms to women's participation in training is reflected in this quote:

Whenever there is any training, my husband attends while I stay home to perform my household responsibilities. It is impossible for both of us to attend (Participant 17).

This quote reveals the detrimental effects of gender responsibilities to women's acquisition of climate adaptation knowledge and skills. As men acquire more knowledge and skills, they are better positioned to effectively address climate risks than women farmers who due to lack of training increasingly depend on their local farming knowledge. This finding substantiates the argument that women largely stay home to undertake domestic chores and care for children while men attend trainings to their benefit and on behalf of women (Diarra *et al.*, 2021; Mudege *et al.*, 2017; Rola-Rubzen *et al.*, 2020). The lack of consideration by training providers to make training inclusive and accessible in terms of timing undermines women's acquisition of additional agricultural knowledge and skills. This illustrates the relationship between gender norms, shortfalls in agricultural service delivery and gender inequities in

access to training and climate information in consonance with previous studies (Alston, 2013; Ampaire *et al.*, 2020; Arora *et al.*, 2017; Garcia, Tschakert and Karikari, 2020; Lawson *et al.*, 2020).

Informal savings and credit groups

Informal savings and credit groups constitute a crucial component of livelihoods in most households because they enhance the capacities of household members to engage in agriculture. More women (married, widowed and divorced) than men are reported to gain membership in informal savings and lending groups. The prominence of these groups is explained by the participants as connected to the ease with which they are established without mandatory bank accounts, constitution and registration at the sub-county as it is with formal groups. Women's low income levels and limited access to credit due to lack of collateral and limited support from male spouses is explained to contribute to the prevalence of women's participation in informal savings and lending groups. Through pooling finances together in the form of savings, groups collect funds that members borrow and repay with 10 percent interest. Women are stated to mostly borrowed these funds to facilitate purchase of pesticides, hoes, seeds and food in times of scarcity, and address medical care, education and clothing needs of household members. The welfare needs that women address corresponds with their gender responsibilities which will be discussed later (cf. section 5.2). In most savings and lending groups, financial or food items contributions to support bereaved group members are explained to comprise of part of group activities. It is also established that women build networks and support systems through savings and lending groups that are useful for borrowing seeds, hoes and food. In these findings, the pivotal role of social groups in improving women's resource access as observed in the scholarship is illustrated (Assan *et al.*, 2018; Lawson *et al.*, 2020).

Even though it is uncommon for male household heads to participate in informal savings and credit groups as noted earlier, a few men are stated to gain membership in women's groups while some male non-members benefit through their female partners. In most women's saving and lending groups with male members, the men often form part of the executive. In cases where men join when there is already a substantive executive serving, they are co-opted into leadership based on the consensus by female group members. To affirm this, some women narrated that it does not appear well for men to be *mere* members and yet they have brilliant ideas. Other than the cultural perception of men being leaders, their co-option into leadership is also informed by their relationships with group members who are usually either relatives or clan mates. This illustrates the normalisation of men's culturally ascribed roles as leaders providing men with opportunity to prioritise their needs and interests even in institutional spaces that pay attention to the unique needs of women (Angula, M., 2019; Balehey, Tesfay and Balehegn, 2018; lipinge *et al.*, 2000).

In cases where male household heads are non-members, they request their women partners to borrow money on their behalf even though it may be against the will of their partners and pledge to repay. Men spend the borrowed money to purchase agricultural inputs and to address their individual needs that are described as less beneficial to the family (alcohol, sports betting) and others that women largely appear non-cognisant about. It is a norm for male household heads to repay a fraction or none of the borrowed money in contradiction with their pledges. Participants explained that such actions contribute to conflicts in some male-headed households especially when women demand their spouses to repay the loan or decline to borrow the next time they are asked. To avoid conflicts, most married women repay the loans but rarely accept

to borrow money whenever asked by their partners. Women's repayment of loans used by men illustrates men's abuse of power and exploitation of women because they spend money borrowed by women for their individual interests and decline to repay (De Brauw, Kramer and Murphy, 2021; Tavenner *et al.*, 2019). This finding further discloses that the exploitation that women experience in male-headed households extends beyond agriculture and it encompasses other livelihood activities such as savings and non-farm activities.

The conflicts that emerge from women declining to borrow money from savings and lending groups for their spouses lead some male household heads to restrict their partners involvement in savings groups. Other male household heads direct their female partners to withdraw their membership. Citing the significance of savings and lending groups, most married women explained that they maintain their membership without the knowledge of their partners. As a result, some hardly attend meetings and so they rely on their friends for any group related updates. With regards to remittance of savings and loan repayment, children are critical because their mothers send them to deliver the money to the group treasurer. As a result, some women are less involved in group decisions and rarely contribute ideas to improve group effectiveness. Due to such difficulties, some married women do not gain group membership although they desire it as illustrated in this extract:

I have always desired to join a savings group but whenever I told my husband he would say I will join on your behalf. I just joined a group recently after his demise (Participant 8).

This extract shows spousal related constraints that married women deal with and the complication that these constraints impose on women's ability to undertake autonomous decisions and pursue financial independence. Therefore, even though

women's decisions are curtailed as revealed in the earlier discussions, some constraints of married women differ from that of widowed and divorced women (cf. section 5.1.1). It can be stated that the absence of male household heads improve women's ability to make independent decisions as recognised in the literature (Klasen, Lechtenfeld and Povel, 2015; Quisumbing and Doss's, 2021). However, this does not imply that female household heads have equal power to that of male household heads to determine priorities. This is because women, despite their marital status, are limited by socio-cultural practices revealed in the earlier analysis (cf. section 5.1). Some of the socio-cultural hinderances that women confront relate to gender responsibilities discussed in the ensuing section (5.2).

The evidence in sections 5.1.1 and 5.1.2 prominently reveals gender disparities in women's access and control over material and non-material resources even in situations where the social characteristics of women such as marital status and leadership try to moderate gender inequities. These gender inequities are noted to have been majorly orchestrated by cultural norms and limitations of formal institutions in correspondence with FPE perspectives on the role of de facto and de jure factors in constructing men's and women's resource access, ownership and control rights (Rocheleau *et al.*, 1996). Since the resources discussed above are critical for adapting to climate change, their limited access signifies women's limited adaptation capacities. The relationship between women's limited access to material resources and the power to make adaptation decisions has been documented in previous studies (Alare *et al.*, 2022; Badstue *et al.*, 2020; Deschênes, Dumas and Lambert, 2020; Lawson *et al.*, 2020).

5.2 Gender responsibilities

This section centres on productive and reproductive gender responsibilities in households and the division of these responsibilities among household members. It contributes to the understanding of the connection between the gender responsibilities of women and their adaptation decisions.

5.2.1 Productive responsibilities

The productive responsibilities of household members majorly concerned farming. These responsibilities encompassed tilling land, planting, weeding, management of crops pests and diseases, harvesting, drying crop produce, tending animals and marketing. Household members – male household heads, female household heads, married women and children – undertook these productive responsibilities but at varying levels as presented in Table 4.

Table 4: Productive gender responsibilities of household members

Farming activities	Labour		Farming tools		Decision-making	
Tilling land	Mostly women, labour hired by male household heads	Occasionally male household head's own labour	Male household heads mostly use ox-ploughs	Women mostly use hand hoes, occasionally ox-ploughs (marrieds, widows)	Mostly female household heads, male household heads	Occasionally married women
Planting	Mostly women, Children	Occasionally own and hired labour by male household heads	Male household heads mostly use ox-ploughs	Women mostly use hand hoes	Mostly female household heads, male household heads	Occasionally married women
Weeding	Mostly women	Occasionally children		Women mostly use hand hoes	Mostly female household heads, male household heads	Occasionally married women
Management of crop pests and diseases	Male household heads own and hired labour, women	Occasionally labour hired by female household heads	Male household heads mostly use sprayer pumps	Women mostly use hand-made brooms, female household heads occasionally use sprayer pumps	Mostly male household heads, women	
Harvesting	Women, children, male	Occasionally labour hired by male	Mostly hand hoes and hand knives		Mostly male household	Occasionally married women

	household heads	household head			heads, female household heads	
Drying crop produce	Mostly women, children				Mostly male household heads, female household heads	Occasionally married women
Tending animals	Mostly women	Occasionally children, male household heads			Mostly male household heads, female household heads	Occasionally married women
Marketing	Mostly male household heads, female household heads				Mostly male household heads, female household heads	

Source: Field data from gender disaggregated seasonal calendar (2022)

Tilling land

Male household heads, female household heads and married women till land but variations are reported in the labour and tools utilised by women and men (cf. Table 4). Whilst most women use their own labour and hand hoes, the majority of male household heads till land using hired labour. For the times that male household heads use their own labour, they use ox-ploughs. Occasionally, a few widows with oxen, married women with supportive partners sometimes use ox-ploughs if the land being cultivated is relatively big (0.5 - 1 acres). Women's reliance on their own labour and hand hoes is informed by limited ability to hire ox-ploughs due to low income levels and the small size of land that women cultivate.

Male household head's hire of labour and the use of ox-ploughs is connected to their traditional ownership of cattle, larger farming land compared to that of women (cf. section 5.1.1) and ability to hire ox-ploughs. This signifies that women's tilling of land is more labour-intensive and time consuming in comparison to that of male household heads. However, some variations in the extent to which women's tilling of land is labour intensive are disclosed. Women who exclusively rely on their labour and hand hoes till land more manually than those who occasionally use ox-ploughs such as some widows and married women. As a result, some women are overburdened with tilling the land compared to others, but this does not disregard the observation that women broadly till land manually. This corresponds with the observation that women engage in agriculture manually (Pierotti, Friedson-Ridenour and Olayiwola, 2022). Women's labour-intensive farming practices denote potential hinderances in adopting some adaptation strategies in the right timings and intensities.

Planting

Women are mostly responsible for planting crops with help from children who participate after school (cf. Table 4). Male household heads sometimes participate in planting crops for commercial purposes using their own or hired labour (women and men). The involvement of male household heads in planting crops is largely in response to anticipated weather changes. Whenever rainfall is forecasted to cease early and to adversely impact crop germination, male household heads hire labour to quicken planting before the rains disappear. During planting seasons, some married women conflict with partners who direct crops for commercial purposes to be planted first before those for subsistence. These conflicts are uncommon in female-headed households because they are solely responsible for deciding how and when to plant crops. To keep pace with the planting season, the majority of married women stated that they divide their time between planting subsistence and commercial crops. A participant shared how she navigates planting crops for commercial and subsistence purposes amidst time constraints:

When rains are almost disappearing and yet I have not planted crops for food, I work in the main garden in the morning and then in the small garden in the evening. This helps me to avoid problems with my husband who wants the main garden planted first (Participant 16).

This quote demonstrates women's compliance with the demands of men and use of mechanisms that ensure that crops for subsistence are also planted. This aligns with women's interest in preserving family peace as well as safeguarding their survival as noted in the literature (Alordiah *et al.*, 2022; Rocheleau *et al.*, 1996; Rotimi, 2013). It can therefore be noted that women farmers sometimes comply with the dictates of male household heads and fulfill their gender roles as strategies for enhancing familial harmony and its resultant benefits. This aligns with some African feminist perspectives about women's creativity in advancing their interests using creative strategies such as

compliance with their gender roles and compromising their interests (Gatwiri and Mumbi, 2020; Kawarazuka, Locke and Seeley, 2019). The above quote also shows women investing more time in agriculture than men in favour of the interests of male household heads. Women's investment of their time in planting despite their control over resources in household reveals gender power asymmetries and subjugation. In the literature, women's increased labour in agriculture such as during planting has been associated with men's exploitation (De Brauw, Kramer and Murphy, 2021; Tavenner *et al.*, 2019). However, this exploitation is not homogeneous, it varies across women and households depending on marital status, nature of relationship with male household head and household headship.

Weeding

With respect to weeding, women are prominently responsible for weeding commercial and subsistence crops with the help of children as represented in Table 4. It is uncommon for male household heads to weed family crops and even to hire labour because weeding is perceived as women's traditional responsibility. Participants explained that weeding is recognised as appropriate responsibility for women due to the care with which it is undertaken and amount of time farmers spend weeding. Some women participants explained that because weeding takes time, patience and requires bending to pull weeds underneath the plants and putting soil, men find it exhausting. Based on this, weeding is associated with women because it aligns with how domestic chores are undertaken. This substantiates the argument that women undertake most laborious agricultural activities (Patil and Suresh Babu, 2018; Satyavathi, Bharadwaj and Brahmanand, 2010). Although women acknowledge weeding as their responsibility, they note that it is burdensome and exhausting both physically and emotionally. Ascribing women laborious agricultural activities compromises their

abilities to adopt adaptation measures that are described as labour intensive despite the effectiveness of those measures in moderating climate risks.

Management of crop pests and diseases

The management of crop pests and diseases is undertaken by male household heads and women (cf. Table 4). Whilst female household heads (widowed and divorced) address crop pests and diseases exclusively, married women and male household heads undertake this responsibility collectively. Male household heads mostly concentrate on crops cultivated for commercial purposes while married women focus on crops farmed for subsistence. But in cases where crops for subsistence and commercial purposes are farmed in the same garden, male household heads take the lead in addressing pests and disease related problems. Male household heads purchase pesticides and fungicides and spray crops using sprayer pumps but sometimes request financial support from their women partners. In response, some women borrow money from their savings and lending associations (cf. section 5.1.2). This denotes that women participate more in addressing crop pests and diseases than male household heads who primarily focus on crops farmed for commercial purposes.

In cases where crops for subsistence and commercial purposes are cultivated in separate gardens, married women largely address pests and diseases that infest crops for subsistence purposes. The majority of women purchase pesticides according to their incomes and spray crops using hand-made brooms (cf. section 5.1.1). Through key informant interviews and interactions with women farmers, it is revealed that due to financial limitations, most women, with the exception of a few widows, purchase counterfeit, wrong and inadequate quantities of pesticides. This shows the negative implications that gender inequities in resource access and control impose on women's

agricultural production as recognised in the literature (Bikketi *et al.*, 2016; Liu, Anser and Zaman, 2021). Women's purchase of counterfeit pesticides and fungicides highlights institutional shortfalls in regulating agrovets (Devkota, Thapa and Dhungana, 2016). However, this does not delink women's purchase of counterfeit pesticides from lack of funds to consult qualified agrovets and to purchase the right quantity and type of pesticides as evidenced in this study.

Harvesting and drying crop produce

Household members (male household heads, women and children) undertake harvesting collectively (cf. Table 4). Male household heads occasionally hire labour to expedite harvesting if the garden from which crops are being harvested is to be cultivated in the second season. This is linked to redeeming time for preparing the garden. It is uncommon for married and divorced women to hire labour for harvesting because they are normally helped by relatives in cases where additional labour is needed. The participation of male household heads rarely involve actual harvesting of crops. It centres on monitoring the harvesting process in line with their traditional roles as controllers of the household (Niemann *et al.*, 2024; Tambulasi, Mkwambisi and Kamoto, 2021).

Male household heads also monitor the drying of crop produce which women majorly were responsible for. It was explained that men do this to modulate losses and to safeguard the harvest from potential theft by women and children and to prevent unauthorised consumption of produce as food. Even though the participation of women and men in harvesting has been reported in Africa (Bikketi *et al.*, 2016; Lelea *et al.*, 2022; Ochieng, Ouma and Birachi, 2014), women largely take on the actual harvesting whilst male household heads supervise their work. Related to other

agricultural activities, male household heads are largely involved in harvesting crops primarily meant for commercial purposes than in crops for subsistence that women mostly harvest. Women's harvesting of crops for both commercial and subsistence purposes demonstrate that women contribute more labour in harvesting than male household heads.

Tending animals and birds

Women are mostly responsible for caring for animals with the help of children (cf. Table 4). Caring for animals constitute women providing pasture, water and monitoring the health of the animals. Even though women are burdened with tending animals alongside fulfilling other responsibilities throughout the year, there are months when they experience the most stress. These stressful months are January, February and March and have been categorised as dry months (cf. Table 6), earmarked with lack of pasture and water scarcity. During these months, poultry disease is prevalent, women harvest fodder, collect drinking water for the animals or walk long distances with the animals to search for drinking water. However, the involvement of children relatively eases women's stress in caring for animals and the burden of other domestic chores. With regards to animal health, female household heads treat their animals and birds when they are unwell. For married women, male household heads are responsible for treating cattle, goats and sheep while women treat poultry. This division of responsibilities is informed by ownership dynamics where male household heads own animals and women poultry as revealed earlier (cf. section 5.1.1). Despite the gender variations in who treats animals and birds when they get sick, women have been observed to contribute more labour than men in caring for animals (Patil and Suresh Babu, 2018; Pattnaik and Lahiri-Dutt, 2020; Satyavathi, Bharadwaj and Brahmanand, 2010).

Marketing

Marketing of agricultural produce is the primary responsibility of household heads – male and female – (cf. Table 4). Married women occasionally sell produce to address welfare needs. However, differences are observed in the quantities that women and male household heads sell. Most women sell agricultural produce in small quantities in local village markets located in the trading centres whereas male household heads market large quantities to middlemen who trade in agricultural produce and in municipal and district markets within and outside their districts. Municipal and district markets are noted to offer better prices for agricultural produce. Other than the quantities of produce sold, the differences in the markets accessed by male household heads and female household heads contributes to gender disparities in earnings from agriculture with male household heads earning more from selling farm produce. This implies that women earn little income from agriculture to improve their abilities to make adaptation decisions. Women's marketing of agricultural outputs in small portions has been observed in previous studies (Assefa and Gebrehiwot, 2023; Hackfort and Burchardt, 2018; Ingutia and Sumelius, 2022; Lelea *et al.*, 2022).

The small quantities of agricultural produce that women market are associated with their prioritisation of storing produce for food, low agricultural outputs and limited power to determine how much to sell for the case of married women. Conversely, the sale of large quantities by male household heads is linked to their control over agricultural produce and primary focus on farming for commercial purposes. Male household heads are stated to use their power to sell produce reserved for food including those that are not mature and are still in the garden. Whenever married women resist the decisions of male household heads to sell produce meant for food, conflicts that involve physical violence emerge in some households. In response,

some women report their spouses to the clan in cases where produce for food is persistently sold leaving the family to starve. These conflicts are resolved by the clan as it will be revealed in detail later (cf. section 5.3). Moreover, other women devise mechanisms of managing the effects of male household heads selling agricultural produce spared for food by reducing the number of meals the family eats in a day, engaging in casual work and borrowing from trusted friends and relatives. As a result some married women earn the approval of their spouses to trade in consumables (roasted sweet potatoes, vegetables) and taking up casual work. This aligns with the observation that sometimes women conform to the demands of their men partners in order to achieve certain benefits (Kawarazuka, Locke and Seeley, 2019).

5.2.2 Reproductive responsibilities

The reproductive responsibilities discussed in this section concerns caring for family members through addressing welfare needs, food, clothing, shelter, medical care, school fees and scholastic materials for school going children. These discussions demonstrate the relationship between gender equities and inequities in reproductive responsibilities and women's adaptation decisions.

Food

Women are primarily responsible for ensuring that members of their households are food-secure throughout the year. Male household heads are observed to previously involve in food provision by providing female partners with quality land to cultivate. But women farmers explained that, over the past two decades, the majority of male household heads have become less concerned about how members of their households feed. Participants attributed this shift to changes in welfare needs, commercialisation of agriculture and women's involvement in savings groups, petty

trade and casual work. For instance, even though male household heads provide their partners with land to cultivate food, women reported that men are hardly bothered by the quality of land and agricultural outputs despite having options of supporting women to access manure or better quality land. Coupled with barriers in cultivating improved seeds, using fertilizers, managing pests and diseases and diversifying income sources, women's food provision burden can be described as worse. Since married women grapple with male household heads selling food (cf. section 5.2.1), their difficulties are more pronounced than that of female household heads. The limited involvement of male household heads in food provision aligns with them practicing agriculture primarily for commercial and not subsistence purposes. This departs from women's focus on agriculture which is largely subsistence. Women's provision of food is recognised to constitute part of their traditional gender responsibilities (Djouidi and Brockhaus, 2011; Niemann *et al.*, 2024).

In months of severe food scarcity, January, February, March, April, and May usually before the harvesting season as revealed through the gender seasonal calendar, some male household heads conflict with women partners. Participants explained that these conflicts connect to women requesting male household heads to support with providing food. Male household heads are stated to largely distaste being bothered with food issues claiming that they have bigger responsibilities. However, a few male household heads were found to be cognisant of these months and reported to occasionally purchase maize or cassava flour for their families. This is noted to lessen women's burden of feeding family members. Conversely, in the majority of households, male household heads spend most of their time outside home to avoid being asked to provide food. Such men return home in the night expecting to be served food as expressed in this focus group discussion extract:

During months of food scarcity, men spend most of their time in the trading centre where they eat breakfast and lunch leaving the family to starve. They return home late in the night and demand for food. So, women struggle to provide food for the children and their husbands (FDG 1).

Based on this extract, women provide food for their husbands despite their contribution in accordance with their traditional responsibilities of feeding the family and caring for the family. This accounts for why women cultivate cover crops and drought resistant crops in order to enhance food security whilst men farmed fast maturing vegetables for commercial purposes in climate adversity (Van Aelst and Holvoet, 2018; Zakayo *et al.*, 2021).

Clothing

School uniforms, clothes for regular use and beddings are recognised as essential clothing to household members. These clothing needs are mostly addressed by women except on a few occasions do male household heads purchase clothes for their family members. These occasions are Christmas, New Year and when a child was joining a new school or another level of education that requires a new uniform. Women's dominance in addressing clothing needs is linked to its perception as a low cost by male household heads. To address these clothing needs, women explained that they borrow money from their savings and lending groups (cf. section 5.1.2) and also use their earning from casual work and petty trade. This denotes that rarely do women utilise their savings to diversify their income sources other than to meeting multiple welfare needs in their households. Women's inability to diversify their income sources adversely impacts their attainment of socio-economic autonomy which consequently effects their decision-making capacities, benefits to children and other household members (Seebens, 2011; Seshie-Nasser and Oduro, 2018).

Shelter

The construction of the family house, kitchen, animal shed, general maintenance and repairs due to the effects of harsh weather such as heavy storms, rainfall, strong wind, or floods are the shelter related needs in most households. Male household heads were reported to construct the family house, kitchen and animal shed. Women are mostly responsible for maintaining the house by smearing, using soil, cow dung and ash because houses are mostly constructed using mud. Male household heads undertake repairs that involve leaking roofs. It is further revealed that whenever there is any shelter related need to be addressed, male household heads encourage women partners to work hard to boost agricultural outputs in order to raise money to construct a new family house, repair or renovate the existing one. But still, even though women work hard and the family realises improved agricultural outputs, barely do men fulfil their pledges. The experience of male household heads failing to fulfil shelter related commitments is illustrated in this quote:

I cultivated with my husband on three occasions with the aim of raising funds to construct a house, but I have been very disappointed. The third attempt was the most disappointing. We had a good harvest and agreed that after him selling the potatoes, he would buy iron sheets and transport them home, but this never happened. He came back home empty handed, and I never saw any money apart from 50kgs of maize that he bought for food. As a result, I slightly withdrew from farming but later on resumed actively due to the welfare of my children (Participant 17).

This quote reveals men's limited prioritisation of the housing needs of their household members and women's determination to address the welfare needs of children despite conflicting with their partners. This aligns with the arguments that women are concerned with the welfare needs of their children and that of other family members than the men (Duflo and Udry, 2004).

Medical care

Through the gender seasonal calendar, it was found that malaria, diarrhea, typhoid, cough, flu, and pneumonia which mainly attacks children are common illnesses that affect household members. Of these, malaria is stated to be the most fatal and expensive to treat and prevalent during the rainy months (April, May, July, August, and September) as shown in Table 6. In these months, mosquitoes are reported to be widespread. Participants explained that women are responsible for ensuring that children access initial medical care from government health facilities that provide free medical care in the first instance. This substantiates the observation that women are the primary health care providers of children and other family members in alignment with their reproductive responsibilities (Azad *et al.*, 2020; Seshie-Nasser and Oduro, 2018).

However, because health facilities run out of antimalarials during months of high prevalence, male household heads were reported to involve in providing medication. Women attributed this to their inability to afford antimalarials whose costs range between Uganda shillings 5000 - 7000 (\$1.33 - 1.86) besides purchasing other accompanying medicines for pain relief. Much as male household heads are reported to be reluctant to respond, they were found to provide financial support depending on the severity of the patient's health condition and the farming season. In cases where the health of the patient is deteriorating and during the planting and weeding seasons, women explained that male household heads are largely responsive in addressing the medical care needs of their household members. It was established that during these seasons, male household heads are responsive due to their focus in ensuring that agricultural activities undertaken by women are not disrupted. This signifies that male household heads address health care needs of women mostly because of the

associated economic benefits of women being healthy and possibly not because they prioritise women's health. The relationship between men addressing women's health care needs and women undertaking core agricultural activities is illustrated in this excerpt:

From the time crops are planted until the weeding season, most men care about the health of their wives. When women get sick, they are treated immediately (FGD 5 participant).

This excerpt demonstrates men's exploitation of women's labour as observed in feminisation of agriculture scholarship (cf. section 3.2.2). It can therefore be asserted that, when male household heads spend on women's health, it can be described as a socio-economic investment. This is because the fundamental aim of men is to possibly ensure that women are in good health to fulfil their agricultural responsibilities.

School fees and scholastic materials

In households with school going children, school fees and scholastic materials (reading and writing resources) are essential. School fees is a pronounced need for children attending private primary schools, secondary schools and colleges. But because public primary schools are free, there are more children studying in public primary schools than in private primary schools. As a result, payment of primary school fees is uncommon among the majority of households. With regards to secondary school and college fees, both male household heads and female household heads play significant roles. Whilst female household heads provide both school fees and scholastic materials, in men-headed households, women partners majorly provide scholastic materials in situations where male household heads are unable or decline to provide. This implies that female household heads are more burdened with addressing the education needs of children because they meet this responsibility

independently in comparison to male household heads who are supported by their wives.

But whilst male household heads provide school fees for both sons and daughters, most female household heads prioritise paying fees for sons than daughters. Male household heads are reported to pay school fees for both sons and daughters in fulfilment of their gender roles of addressing big financial needs, enhancement of their social status and inclination to reward a hardworking and supportive wife. Women explained that this motivates married women to support the agricultural activities of their partners. The payment of fees by male household heads differ from female household heads. Female household heads are found to mostly prioritise paying school fees for sons based on the perception that sons are future household heads and that females are unpredictable, susceptible to early pregnancy, marriage and school dropout. Even though this shows the issues that undermine educational achievements of females, such perspectives perpetuate gender biases that hinder potential successes of females and associate daughters with low social status. This advances traditional ascription of headship and power to men as noted in previous studies (Bikketi *et al.*, 2016; Farnworth *et al.*, 2023; Vercillo, 2022).

The above results reveal provision of food, clothing, shelter, medical care, school fees and scholastic materials for school going children as the main reproductive responsibilities that women and men undertake (cf. section 5.2.2). Females are reported to undertake most reproductive responsibilities. However, the involvement of males is reported but majorly, in specific seasons and situations. For instance, provision of food during seasons of severe food shortages such as in the months of January, February, March, April and May and purchasing clothes during special

occasions such as Christmas and when a child is attending a new school level. Moreover, men sometimes address family shelter needs, fund access to medical care and school fees. This signifies that males inconsistently and inadequately participate in addressing reproductive responsibilities in households. As a result, females are disproportionately burdened with reproductive responsibilities.

In summary, results in section 5.2.1 and 5.2.2 evidence gender inequities in the division of responsibilities in households with women undertaking most reproductive and productive responsibilities. Even in cases where men are responsible for fulfilling certain welfare needs such as managing crop pests and diseases and providing school fees, women still participate in addressing those needs. This depicts women increasingly undertaking productive responsibilities such as agricultural activities alongside fulfilling reproductive roles. These results align with perspectives about women's expansion in agriculture interpreted as feminisation of agriculture noted to subjugate and exploit women (De Brauw, Kramer and Murphy, 2021; Farnworth *et al.*, 2023; Tavenner *et al.*, 2019). The earlier works of FPE associates the disparities in gender division of roles to patriarchal structures arguing that, patriarchy assigns women specific responsibilities particularly as labourers and home carers and men as managers of land (Rocheleau *et al.*, 1996).

5.3 Power, intra-household conflicts and resolution

Whilst building on gender power dynamics revealed earlier (cf. section 5.1 and 5.2) and integrating new observations, this section discusses gender power differences among household members and their linkage to intra-household conflicts. Conflicts and their resolutions reveal power imbalances that configure adaptation decisions.

5.3.1 Gender power dynamics and intra-household conflicts

Gender power disparities are evidenced through differences in men's and women's access to and control over both material and non-material resources and disproportionate division of productive and reproductive responsibilities (cf. section 5.1 and 5.2). In all these aspects, male and female household heads are found to possess the power to determine priorities and make decisions but, the power that male household heads have contrast that of female household heads and married women. This links to traditional gender norms that ascribe men social superiority and power in comparison to women. Much as female household heads have the power to make certain autonomous decisions about resources and responsibilities, gender norms curtail their power to determine the utilisation of customary land. This further links to the high socio-cultural value attributed to customary land and also explains the involvement of close relatives of deceased male spouses and the clan in land related issues (cf. section 5.1.1). Since female household heads have the power to undertake most decisions about resources and responsibilities except with respect to customary land, it can be noted that the conflicts experienced by some female household heads (widows), largely relates to customary land, the involvement of close relatives deceased male spouses and the clan.

Moreover, gender power disparities in male-headed households are majorly demonstrated through male household heads apportioning women poor quality land to farm and reserving the most fertile land for themselves (cf. section 5.1, 5.2). Power disparities is also stated to pertain to male household heads controlling high economic value resources and assigning women partners control over animal products with low economic value. Additionally, male household heads largely market agricultural outputs, determined how earnings from agriculture are utilised and women undertake

the majority of productive and reproductive responsibilities. This evidence shows the prevalence of gender power imbalances in male-headed households than they are in female-headed households. Given that control over resources configure the power to make decisions (Badstue *et al.*, 2020), it can be asserted that the abilities of married, widows and divorced women to make independent decisions are limited with that of married women being the most inhibited.

The gender power imbalances facilitate the majority of male household heads to prioritise their needs and interests thus contributing to conflicts in households. In female-headed households, conflicts commonly emerge due to close relatives of deceased male spouses using their power to claim family land. This differs from male-headed households where conflicts centre on household heads selling all agricultural outputs including what was meant for food and spending earnings from agriculture to address individual needs. Conflicts also evolve around male household heads hiring out family land without the consent of women partners, declining to pay money borrowed from savings and lending associations and restricting women's participation in non-farm income generating activities. Other disagreements in male-headed households relate to variations in the choice of crops of male household heads from that of women partners. This shows that men largely utilise their power to address their needs and interests. But as noted earlier, there are cases when male household heads address the needs of women and children (5.2.2) revealing that some intra-household gender relations are concord. Based on this, the utilisation of power plays a central role in configuring intra-household gender relations. As noted in scholarship, intra-household gender relations are shaped by the extent to which those with power to determine priorities take into account the concerns of those with limited decision-making power (Deschênes, Dumas and Lambert, 2020; Eriksen and Lind, 2009).

5.3.2 Conflict resolution

To resolve conflicts, aggrieved household members, primarily women, employed conflict prevention strategies and sought the intervention of relevant authorities based on the severity of the conflict. Women were reported to seek help from the clan, LCI, sub-county, Child and Family Protection Unit of police and occasionally from Action Aid and Paralegals. The conflicts for which women solicit the intervention of these authorities concern male household heads persistently selling agricultural produce leaving the family with no food. Other disputes for which similar help is sought pertains to male household heads leasing out family land without involving women partners, physical violence and relatives of deceased male spouses claiming land that belongs to the deceased. Women commonly seek the intervention of the clan before proceeding to other levels unless the conflict involved clan leaders. For disputes that involve clan leaders, female household heads who mainly had disputes with clan leaders over land seek redress from the sub-county, police, Action Aid and Paralegals.

The disputes presented to the clan are addressed through meetings convened by the clan chairperson, attended by clan leaders and the parties involved in the dispute. Each of the parties in the dispute are given an opportunity to explain their perspective on the issue. It is based on these submissions that the committee discusses, resolve or refer the dispute to the sub-county or police. Referrals by the clan to the LCI were reported as rare because clan leaders are commonly part of the Local Council I executive. So, hardly do the findings and conflict resolution strategies of the LCI differ from that of the clan. At clan level, disputes are commonly addressed through counselling the parties involve, reprimanding the accused, obtaining their commitment to refrain from future offenses, promoting forgiveness and encouraging the parties to work together for the welfare of their family and children. Much as most women

expressed dissatisfaction with the way the clan resolves disputes, women largely report conflicts to the clan first before seeking the intervention of state and private agencies. Seeking the intervention of the clan in the first place is perceived as women revering cultural leaders and it also demonstrates their prioritisation of family peace, unity and stability. Conversely, women who seek alternative help other than from the clan were given negative labels as ingrates, indisciplined, troublesome and disrespectful. These labels align with the cultural expectation of women's conduct which resonates with preserving harmony in households (Alordiah *et al.*, 2022; Rotimi, 2013). The negative perspectives advanced about women who seek help from other authorities aside from the clan links to restrictive gender norms that not only constrain women's mobility but their decisions and actions (Etale and Simatele, 2023; Ramaroson *et al.*, 2022). Such perspectives influence women's decisions about the kind of issues for which they solicit help from other authorities beyond the clan.

Physical abuse by male partners and land grabbing by relatives of deceased male spouses and some clan leaders were stated as the major reasons for which women solicit the intervention of the sub-county, Child and Family protection unit of police, Action Aid and Paralegals. Whilst married women primarily report physical abuse by their male spouses, female household heads report land grabbing by the relatives of their deceased men partners. Women are noted to widely prefer seeking help from Action Aid and Paralegals based on their perceived effectiveness in addressing women's land and domestic violence issues. However, because Action Aid closed its rural shelters in the fieldwork area and paralegals do not have rural offices, the majority of women sought help from the sub-county and the Child and Family protection unit of police. Women explained that they solicit help from the sub-county and police because they find it challenging to move to towns where these agencies

are situated. Despite mobility challenges, a few widows were found to solicit help from Action Aid and Paralegals in relation to land issues which they felt state agencies cannot effectively resolve. This highlights the gaps that compromises the contribution of state formal institutions in addressing gender issues in correspondence with institution related literature that recognises lack of transparency, corruption and insincerity as shortcomings of some institutions (Nunan *et al.*, 2018; Valdivieso, Andersson and Villena-Roldán, 2017; Whaley, 2022).

When women report issues, mediation is conducted by the agencies to which the issues have been reported whilst involving both the aggrieved and accused parties. Arrests and referrals for legal court proceedings were stated to be pursued when mediation fails. This denotes that conflict resolution in household are hardly addressed autonomously by state and private agencies but rather collaboratively as will be discussed in detail in the next Chapter (six). Despite gender being mainstreamed in gendered institutional sites such as private and public organisations, inequities in intra-household gender relations persist. Gaps in the police are revealed to compromise the outcomes of conflict resolutions. This involves some police officers releasing arrested suspects after being bribed and asking women to go back and discuss their disputes with the clan and the accused person in the first place. Whenever male household heads are released in this way, married women were reported to suffer adverse consequences evidenced through strained relationships with men partners, increased domestic violence and narrowed opportunities for women to bargain their decisions and actions. This discourages most married women from seeking help from law enforcing agencies. The results further signify that, mainstreaming gender concerns in different gendered institutions inadequately address disparities in intra-household gender relations. Integrating initiatives that dedicatedly focus on addressing unequal

intra-household gender relations may be useful in enhancing equitable intra-household gender relations and adaptation decision-making prospects.

5.4 Conclusion

Analysis in this Chapter reveals asymmetries in intra-household gender relations that have been significantly constructed and reconstructed by cultural norms. These asymmetries manifest through women's limited access and control over resources, disproportionate division of gender responsibilities and power imbalances. Much as the intersecting effects of other social identities of women such as marital status, household headship, family resource endowment, age, children and assertiveness try to leverage asymmetrical intra-household gender relations, disparities still persist. The persistence of gender disparities illustrates the intricate nature of intra-household gender relations, the framings of gender equities and inequities and the complexities with which women farmers navigate gender asymmetries in adaptation decision-making.

The strong connection between asymmetries in intra-household gender relations and cultural norms and the intervention of state and private agencies in addressing intra-household conflicts is evidenced in this Chapter. This portends the interrelationship between intra-household gender relations and gendered institutions thus proposing their linkages to women's adaptation decisions. This Chapter on intra-household gender relations leads to Chapter six which interrogates gendered institutions, their interactions and interrelationships with intra-household gender relations.

CHAPTER SIX: GENDERED INSTITUTIONS AND THEIR INTERACTIONS

6.0 Introduction

In Chapter five, the relationship between asymmetries in intra-household gender relations with respect to resource access and control, division of responsibilities and power, and gendered institutions is revealed. This Chapter (six) explores the interactions between gendered institutions, their interconnections with intra-household gender relations and influence on adaptation decisions of women farmers. My conceptualisation of gendered institutions is informed by the literature reviewed (cf. section 3.3), and FPE perspectives supplemented by SRA. Gendered institutions are conceived as formal and informal rules that impose gendered implications on the capacities of farmers to adapt to climate change. Specifically, the Chapter discloses how variedly formal and informal gendered institutions interact with each other. The different forms of gendered institution interactions are assessed guided by Helmke and Levitsky's (2004) categorisation of formal and informal institution interactions. The Chapter also deduces the implications of interrelationships between the interactions of gendered institutions and intra-household gender relations on women's abilities to make adaptation decisions.

This Chapter is organised in three sections. Section 6.1 discusses the gendered formal and informal institutions that interact with each other whilst highlighting their interconnections with women's access and control over resources, division of responsibilities and power. In the second section, 6.2, I focus on the interactions between gendered institutions by examining their interplay in the execution of official and non-official rules and how this interplay constructs gender power differences guided by SRA. In examining these interactions, I also reveal their interlinkages with intra-household gender relations and implications on women's adaptation decision-

making. Lastly, section 6.3 provides the Chapter conclusion highlighting the connections between the interactions of gendered institutions, the outcomes of their interrelations with intra-household gender relations and effects on adaptation decisions of women farmers.

6.1 Gendered institutions

The gendered institutions that interact with each other are classified as formal and informal. These institutions impose gendered implications on the capacities of farmers to adapt to climate change and have been identified with the aid of Venn diagram method employed during data collection. Exploring gendered institutions reveals specific aspects of institutions through which interactions occur. This facilitates the mapping of the interrelationships between formal and informal gendered institutions, their outcomes on intra-household gender relations and influence on women's adaptation decisions.

6.1.1 Formal gendered institutions

The formal gendered institutions that interact with each other are state and non-state rules such as rules and regulations of formal agricultural and micro-credit agencies. These rules have aspects that explicitly focus on gender concerns such as addressing gaps in men's and women's access to resources, division of gender responsibilities, power relations, dispute resolution and delivery of agricultural related services and inputs.

State rules

The state rules that aim at addressing gender concerns and interrelate with intra-household gender relations are revealed. Through key informant interviews, some formal gendered institutions have been disclosed as shown in this extract.

In Uganda, we have rules and regulations such as the Land Act, Local Council Courts Act, Climate Change Adaptation policy, Agricultural Extension strategy, Succession Act, Agriculture policy and Organic Agriculture policy which state agencies at the national, district and sub-county level rely on to address issues that concern gender, domestic relations, adaptation to climate change and women's empowerment (Key informant 3).

The extract above illustrates gendered formal institutions that work at different levels to address gender issues, agricultural and climate change concerns. However, further interactions with key informants and women participants rarely disclosed specific aspects within the above formal institutions that focus on gender and climate change. Most of the evidence revealed the aim of state formal gendered institutions in promoting gender equity and enhancing the ability of females and males to productively engage in agriculture. This suggests that climate change adaptation concerns of women are mainstreamed in agricultural programs and projects and are not treated as independent issues that require dedicated attention and focus. This is congruent with the argument that gender equality concerns in Africa such as those that relate to climate adaptation are largely integrated within institutional arrangements that target the advancement of women's resource rights and empowerment in different aspects such as agriculture (Bouchama *et al.*, 2018; Olajide and Ikenwilo, 2014; Techane, 2017). Moreover, this further alludes to the plural and patchy ways through which institutions function (Whaley, 2022). This plural and patchy functionality of institutions is evidenced through their concentration on addressing multiple rather than single concerns. This may compromise detailed consideration of the issues that undermine climate adaptation decisions of women farmers.

To substantiate the comprehension of the specific aspects of the formal gendered institutions and their interlinkage with intra-household gender relations, secondary data has been integrated in the ensuing discussions.

State rules that pertain to land access, control and dispute resolution were noted to interlink with intra-household gender relations and shape adaptation decisions of women farmers. These state rules are Uganda's Land (Amendment) Act 2010, Succession (Amendment) Act 2000 and the Local Council Courts Act 2006. Informed by secondary data, specific rules of the above-mentioned Acts are explored in relation with their interconnections with intra-household gender relations. The Land (Amendment) Act 2010 regulates transactions that concern family land. Section 39 of this Act states that 'no person shall (a) sell, exchange, transfer, pledge, mortgage or lease any family land, (b) enter into any contract for the sale, exchange, transfer, pledging, mortgage or lease of any family land or (c) give away any family land, inter vivos or enter into any other transaction in respect of family land except with the prior consent of his or her spouse' (Uganda's Land (Amendment) Act 2010, 20).

Closely connected to the Land Act, is the Succession Act 2000 (Chapter 162). Much as I focus on the Succession Act 2000, this Act was amended in April 2022. The Succession (Amendment) Act 2022, commenced on 31 May 2022. The changes made to the previous Succession Act of 2000 relates to the protection of the principal residential property of an intestate for the benefit of a surviving spouse and lineal descendants and the percentage distribution of the estate of an intestate among other revisions (*Succession (Amendment) Act, 2022, 2022*). Most provisions in the Succession Act 2000, such as women's right to inherit land, was maintained. However, since the Succession (Amendment) Act 2022 commenced whilst I was close to concluding fieldwork and participants shared experiences on the basis of the Succession Act 2000, I focus on the Succession Act 2000. In this Act, women's inheritance of their deceased husband's property including land is provided contrary

to customary practices. In sub-sections 29 and 30 of the Succession Act 2000, customary heirs receive one percent, wives 15 percent, dependent relatives nine percent and lineal descendants (children) 75 percent of the deceased person's estate. This applies in situations where there is a customary heir, wife, lineal descendant and dependent relatives. However, in cases where there are no lineal descendants, customary heirs get one percent, dependent relatives 49 percent and wives 50 percent. Where there is either a wife or dependent relative, either of them receive 99 percent and the customary heir is apportioned one percent of the deceased person's property (Uganda's Succession Act 2000).

Much as interactions with women revealed their awareness of the above formal rules, there is limited evidence of women utilising these provisions to defend their resource rights such as land. Whilst acknowledging the effects of cultural norms on women's agency, the majority of women reported that they feel powerless. This was found to sabotage the resolve of most women to claim and defend their land rights on the account of formal gendered rules as demonstrated in this extract:

Land traditionally belongs to men! So why would I struggle over what is not mine? Besides that, I have heard that when women report land issues, they are helped but this is not always the case. Usually a man will be arrested but is granted police bond immediately after paying some money. When he returns home, he becomes violent and unsupportive to the family. So, it does not make sense to keep stressing and fighting with men over land (Participant 24).

This extract reveals the strong influence of customary practices on the execution of formal gendered institutions. It also accounts for women's reluctance in seeking the intervention of state rules whenever faced with land disputes. When women feel powerless, inadequately protected and their actions to seek help from state and non-state authorities attract violent treatment from men partners, women's agency is affected. This evidences the complexity involved in women contesting culturally

induced gender injustices through measures such as seeking the intervention of formal gendered institutions (Ademiluka, 2018; Kabeer, 2000; Kawarazuka, Locke and Seeley, 2019; Mwine, 2019). When women farmers rarely seek help, it compromises the relevance of formal gendered institutions in addressing gender and climate adaptation concerns.

In the context of leveraging gender equity in women's access to agricultural training, climate information, farm inputs and implements, formal gendered institutions are critical. The institutions that focus on the above aspects are NAES principles, rules of IFDC and FTB on women's access to agricultural loans. NAES principles are stated to have been established on the basis of the national agriculture and climate change adaptation policies. NAES guides the delivery of agricultural extension services at all levels including the sub-county. Some specific principles focus on empowering and disseminating appropriate technologies to farmers including youth, women and other vulnerable groups correspond with addressing the climate needs and the interests of women (MAAIF, 2016). These principles are the inclusive participation of farmers in extension programmes, categorisation of farmers in terms of their degree of agriculture commercialisation and training targeting the needs of different farmers. These principles constitute critical components that guide delivery of agricultural extension services.

Even though the above rules are gender inclusive, study results showed that men still have more access compared to women. This finding is associated with the shortfalls in the execution of the above formal gendered institutions thus perpetuating gender inequities in access to agricultural trainings and information. For instance, categorising farmers on the basis of commercial agriculture means that group tailored services may

neglect subsistence farmers who are mostly women. Such rules enhance access to agricultural extension services by progressive farmers who are mostly men (cf. section 5.1.2) whilst inhibiting access by female farmers. It can therefore be noted that the rules that have been designed to target the needs of female and male farmers impose differing implications on intra-household relations and adaptation decisions of the targeted farmers. This aligns with the observation that gendered institutions variedly impact men's and women's decisions due to variations in their vulnerabilities (Bremer *et al.*, 2021; Lawson *et al.*, 2020; Mersha and Van Laerhoven, 2016). These variations relate to the differences in men's and women's access to the support of formal gendered institutions.

In congruity with enhancing equity in intra-household gender relations and the capacity of women to decide how to adapt to climate change, some formal gendered institutions focus on resolving gender related conflicts. The Local Council Courts Act 2006 that functions at village, parish, town, division and sub-county level is recognised as pivotal in guiding local courts on how to address gender related conflicts. The Local Council Court is the first instance court that addresses conflicts that involve customary land, children and other civil disputes which are valued at less than 100 currency points (*Local Council Courts Act, 2006*). Disputes that are valued above 100 currency points are stated to be referred to the magistrates court. One currency point is valued at Uganda shillings 20,000 (\$5.40). In correspondence with their power, local council courts are mandated to employ forgiveness, reconciliation, declarations, apologies, compensation, restitution, attachment and sales, imposition of fines and community service to resolve conflicts (*Local Council Courts Act, 2006*). Some of these conflict resolution mechanisms are similar to cultural norms that majorly emphasise forgiveness and the subtle conflict resolution strategies that female and male farmers

employ in their households. African feminist literature reports silence and compromise as strategies that some women employ to address family disputes (Agha, 2021; Gatwiri and Mumbi, 2020; Kawarazuka, Locke and Seeley, 2019; Nnaemeka, 2004). Utilising forgiveness in conflict resolution aims at promoting family cohesion even when aggravated offences have been committed (cf. section 5.3). Based on this observation, local council courts can be noted to exhibit limitations in addressing certain issues thus perpetuating gender inequalities.

In pursuit of gender equality, a key informant explained that the court is mandated to have two women members in the executive (Key informant 3). Other than gender, secondary data discloses other characteristics of court members with variations in members attributes across different levels of court. The village and parish level courts comprise of all members of the LCI executive whilst at town, division and sub-county, members are appointed by their councils following recommendations from members of the council executive. Members of the Local Council Court are residents in their respective council jurisdictions, people of high moral character and proven integrity and acquainted with the local language. Other characteristics such as ability to speak English, not holding political position or being a member in another court applies to members only in the town, division and sub-county level courts (*Local Council Courts Act, 2006*).

Since members in the village and parish level courts are the LCI executive and predominantly cultural leaders (cf. section 5.3.2), village and parish level courts can be regarded as an extension of cultural conflict resolution arrangements. Therefore, the outcomes of women's pursuit of justice from customary arrangements can be similar to the outcomes of village and parish level courts. Even though complying with

the above rules contribute to gender related justice and fairness in local council courts, variations in individual perspectives, beliefs and behaviours of institutional actors affect institutional outcomes (Hodgson, 2006). Such effects relate to courts prioritising the concerns of certain categories of people such as men or the wealthy at the expense of others (Deschênes, Dumas and Lambert, 2020; Eriksen and Lind, 2009). In rural communities where resources, responsibilities and power relations are strongly constructed along gender lines, local courts may tend to ignore the unique concerns of women.

Non-state rules

Other than state rules, the rules that guide the operations of IFDC have components that target improving women's access to agricultural training, information and inputs. These rules involve the expansion of women's engagement in training by addressing the constraints that undermine women's access to resources and services (*IFDC Strategy 2020-2030, no date*). Informed by these rules, IFDC is noted to train women on agricultural practices and business, provide fertilizers and conduct field demonstrations with both women and men farmers being encouraged to participate. The rules of IFDC corresponds with some state rules especially on the delivery of agricultural extension services because they also target addressing the needs of women farmers. But considering that more women access training provided by IFDC than those that agricultural extension services provide at sub-county level (cf. section 5.1.1), the rules of IFDC largely appear to enhance the capacities of women farmers to make adaptation decisions.

With respect to accessing credit, the rules of FTB on women's access to agricultural loans aims at reducing gender asymmetries in credit access. Through secondary data,

it is established that before transforming into a microfinance deposit-taking agency, FTB was registered as a non-governmental organisation known as *Uganda Women's Finance and Credit Trust* ('Women's Agriculture Loan – Finance Trust Bank', no date). This background links to FTB's prioritisation of women's credit needs. FTB's provision of specific agricultural credit named 'women's agricultural loan' that targets women illustrates prioritisation of women's concerns despite providing other non-gender specific credit services to farmers and entrepreneurs. FTB's rules on women's access to agricultural credit stipulates that women must be 18 years of age and above, a permanent resident in the area where the loan is being sought, possess a savings account with the bank, registered with Credit Reference Bureau (CRB), have sufficient collateral, tenancy agreement if the farming land is hired and guarantors ('Women's Agriculture Loan – Finance Trust Bank', no date).

Even though the rules of FTB aim at improving women's access to finances for funding purchase of agricultural inputs and implements critical for climate response, a few women were reported to access FTB's credit. The rules that require women to have collateral such as land and large animals makes FTB's services inaccessible to most women. Moreover, participants argued that, whenever married women seek loans the consent of men spouses is mandatory. Results from key informant interviews show that formal micro-finance institutions require spousal consent so as to moderate the risks associated with loan repayment which impose detrimental effects on their profits. Seeking men's consent reinforces their superiority and power to determine women's adaptation decisions. This further illustrates that women undergo additional checks before being granted formal credit. Women's rigorous credit worth assessment is attributed to their socio-economic vulnerabilities in some studies (Bahta, Strydom and Donkor, 2017). Additionally, the rules that require collateral and spousal consent are

recognised to hinder women's access to formal credit (Khandekar *et al.*, 2019; Ngigi, Mueller and Birner, 2017; Quisumbing and Pandolfelli, 2010). Due to the barriers to women's access to FTB's credit evidenced above, it can be emphasised that women farmers experience more limitations in accessing formal credit than men farmers. These limitations in part account for women's heavy reliance on informal savings and lending groups discussed in the subsequent section (cf. section 6.1.2).

The study results demonstrate that female household heads seek the intervention of formal gendered institutions to address their concerns more than married women. This shows variations in women's reliance on formal gendered institutions and their interlinkage with intra-household gender relations. Despite these variations being linked to marital status, the intersectional effects of women's socio-economic characteristics also shape women's dependence on formal gendered institutions (cf. section 5.2). This substantiates the observation that social variables such as education frames people's ability to seek the interventions of formal institutions (Fischer *et al.*, 2021). On the contrary, participants reported that some formal gendered institutions such as state rules have contributed equities in intra-household gender relations without women consciously basing on them to defend their rights and interests. This is evidenced through some men acting upon their knowledge of state rules and becoming conscious when dealing with their partners on matters concerning resources, responsibilities and the use of power.

To elucidate further on the adjustments made by male household heads, some men were noted to have become less aggressive, involve their wives in decisions about leasing land and selling animals. When male household heads are planning to lease land, it is reported that they become friendly to their partners, discuss when to start

planting alongside other family plans and return home early from the trading centre. Women participants observed that such conduct of male household heads impress them and most women find it easy to consent to the requests of male household heads. Evidence shows that in households with such male household heads, women sometimes have better access to resources, are helped with a few agricultural activities and also engage in decision-making. This enhances the capacities of women to adopt different adaptation strategies such as altering planting dates explored in depth in the next Chapter. Based on this, it can be argued that some male household heads also utilise subtle strategies to act in more gender equitable ways. This broadens the understanding of women practicing agency using strategies such as compromise and negotiation so as to advance their interests to include men. This departs from African feminist literature which majorly evidences women's creative agency through their adoption of implicit approaches to negotiate power imbalances (Arrey-Ngang, 2020; Gatwiri and Mumbi, 2020; Kawarazuka, Locke and Seeley, 2019; Nnaemeka, 2004). Formal gendered institutions play a critical role in improving equity in intra-household gender relations and adaptation decision-making. But this does not conjure a linear positive relationship between formal gendered institutions and women's adaptation decisions. This is because other informal rules such as cultural norms also interconnect with intra-household gender relations in households and impose implications on decision-making capacities of women.

6.1.2 Informal gendered institutions

Cultural norms, patriarchal rules that are upheld and often enforced by male household heads and rules of informal savings and lending groups are found to interconnect with intra-household gender relations. Exploring these rules show informal gendered institutions that interact with formal gendered institutions and their interrelationships

with intra-household gender relations and implications on adaptation decisions of women farmers.

Cultural norms

Cultural norms are stated to regulate and provide guidance on matters that concern resource access and control, division of responsibilities and power of females and males in households. As disclosed previously (cf. section 5.2), male household heads and the clan are culturally mandated to own and control resources in households. As referred to in earlier FPE perspectives, the close relationship between cultural norms and inequities in intra-household gender relations are associated with the prominence of de facto arrangements such as customary rules that shape gender relations (Rocheleau *et al.*, 1996). Cultural norms that relate to land are observed as stronger in comparison to other norms such as those that are concerned with behaviour because land is highly valued and regarded as the cultural heritage of families (cf. section 5.1.1). It is noted that according to culture, the right to inherit customary land which is the most common form of land acquisition is reserved for men. Adult men inherit customary land through patrilineal lineage. This also applies to purchased land that is owned by deceased male household heads. Using the example of Sabiny culture in Uganda, a participant explains the rules that guide land inheritance in the excerpt beneath:

Among the Sabiny, lineage is traced through the clan also known as 'Aret' in the local language. The clan is patrilineal, believed to have strong spiritual connection to its members and is the basis of kinship upon which land is inherited. Members of the same clan are considered blood relatives and cannot intermarry. When a son has been initiated into adulthood through traditional circumcision known as 'Wonset' in vernacular, they are presumed ready for marriage and to form and head their own home. So, fathers give them land as an inheritance, and they are also supposed to safeguard this land with the help of the clan so as to be able to pass it on to their sons once they get circumcised.

In the Sabiny culture, girls do not inherit land because they get married outside the clan and farm on their husband's land (FGD 7 participant).

This excerpt exemplifies critical rules that govern land access and control and also underscores the role of the clan in enforcing land related cultural rules. The excerpt also illustrates that customarily, land is a tool for preserving kinship, land inheritance is restricted to men and practiced along patrilineal lineage. Moreover, land is inherited upon fulfilment of the rite of passage and the power to address land matters is bestowed upon the clan. These rules are similar to those of other cultures. Among the Bagwere, land is a central aspect of cultural heritage and inheritance is restricted to the men. Kinship is further organised along clan lines and the clan is believed to possess ancestral powers to address land related issues and other family conflicts. It can therefore be noted that cultural norms ascribe land ownership and control predominantly to the men. These results substantiate the observations in scholarship that cultural norms impose barriers to women's inheritance of land (Asiimwe, 2009; Bikketi *et al.*, 2016; Farnworth *et al.*, 2023; Van Aelst and Holvoet, 2016; Vercillo, 2022).

Informed by cultural rules on land ownership and control rights, male household heads, close relatives of deceased husbands and the clan were stated to set terms and conditions that guide women's use of land. These conditions encompass leasing land, apportioning land for farming, what crops to cultivate, when and which land to farm. However, the rules of male household heads are more comprehensive in comparison to those set by close relatives of deceased husbands and the clan. This is because whilst male household heads address all land utilisation issues, close relatives and the clan mostly concentrated on apportioning land to family members and decisions about leasing land except in cases where some attempt to grab land in

female-headed households. These rules denote women's constrained access to land and ability to determine what adaptation strategies to implement and when to employ them such as cultivating fast maturing crops, wetland and riverbank farming in order to moderate climate risks.

To further illustrate the relationship between cultural norms that ascribe land ownership and control to female's and male's difficulties in accessing land for implementing adaptation measures, a participant shared her experience:

There was a time I bought two bags of potato seeds and requested my husband to give me a portion of land to cultivate to ease the burden of food scarcity and to generate income for starting a small business but he refused. He told me those are your plans. I am not part of it! I was so discouraged but I had nothing to do other than sell off the seeds (Participant 15).

The quote above denotes how cultural norms that apportion male household heads power to determine access and utilisation of family resources limits women's decisions and efforts to enhance food security and diversify livelihood activities. As long as men are culturally positioned as thinkers, decision makers and the powerful in consonance with the observation in previous studies, gender inequality is perpetuated (Bikketi *et al.*, 2016; Niemann *et al.*, 2024; Rao *et al.*, 2019). This incapacitates women's power to determine adaptation decisions and to employ the knowledge and experiences that they possess to cope with climate risks.

In accordance with cultural rules on family kinship, the clan ensures that female-headed households have a male heir. The responsibility of the heir is to superintend the household by ensuring that household members, including widows, conduct themselves in ways congruent with the customary norms (cf. section 5.3). The heir is rarely involved in daily operations of the family but mainly takes part in addressing issues that concern discipline, conflict among household members and land. In

female-headed households with adult son(s), the first son become the heir, but this depends on the clan's perception of his capability of preserving his father's bloodline. If the first adult son is considered incapable, any other son who has proved to be able becomes the heir irrespective of his birth position. If none of the adult sons are deemed responsible enough to become heirs, the clan identifies a close male relative of the deceased and installs him as the heir. In cases where the sons are young, it is reported that the first son despite his age is figuratively installed as the heir. Due to the heir's age, his responsibilities are executed by an adult close male relative to the deceased in conjunction with the clan until the heir turns into an adult. The presence of heirs, especially close relatives to deceased husbands means the involvement of more people in family decisions and wide consultation.

Besides installing male heirs in female-headed households, the clan was explained to also apportion adult sons and widows land for farming in accordance with cultural norms. The involvement of the clan and close relatives in female-headed household demonstrates unequal gender relations and complicate the liberty of widows to pursue independent climate decisions and actions. The interrelationship between resource control and the power to determine priorities has been observed in previous studies (Anaglo, Boateng, & Boateng, 2014; Badstue *et al.*, 2020; Khoza, Van Niekerk and NemaKonde, 2019). Therefore, even when some female household heads are largely in charge of household resources, lack of land ownership constrains their access to additional resources. These resources include credit to diversify income sources and for purchasing agricultural inputs and implements critical for coping with climate change.

Cultural norms about men's superior power and wisdom and women's inferiority are stated to have been embodied in traditional sayings. In the Bugwere culture, there is a saying 'Omusaiza niye amagezi ge'owaka' and in Sabiny the same saying is 'Ngomnynete a'kaatya ku boondet'. In English, this translates as 'A man is the wisdom of the home'. This ratifies men's installation by the clan as household superintendents discussed in the earlier paragraph. Even though there are contesting views among participants about men being the source of wisdom in households, these sayings allude to how culture powerfully positions men in ways that imposes barriers to women's adaptation decision-making abilities. Contrary to men's wisdom, results show that most male household heads enjoy the privilege of being regarded as wise even when their perceived wisdom rarely translates into improved wellbeing of the household. This has been further evidenced in key informant interviews which reveal women demonstrating wisdom during climate adversity in this extract.

Hailing men as wise is a traditional norm which only exacerbates inequality. From my experience women are so intelligent based on how they fulfil their responsibilities. They have devised mechanisms of sustaining the family even with low incomes and the negative effects of climate change on agricultural yields. In fact, in some households, men are irresponsible, alcoholics and negligent to the extent that their wives clothe them. So, of the two who is wiser? (Key informant 4).

The extract above shows an alternative perspective about the wisdom of females and males informed by the roles played by women in ensuring the survival of their household members which deviates from the cultural norms. Adapting to climate change in ways that effectively moderate its risks on human survival goes beyond the rhetoric of who is the epitome of wisdom in households. It instead draws attention to the significance of household members learning from each other's experiences through dialogue, negotiation and harnessing different perspectives. The cultural

attribution of wisdom to men portrays women as incapable of adapting to climate change and can be demoralising to women's adaptation efforts.

In terms of responsibilities, cultural norms are reported to have domesticated women. The domestication of women's responsibilities and its detriments to women's mobility, learning and access to agricultural training and climate information has been highlighted in the previous Chapter (cf. section 5.1.2). Similar to the traditional sayings about wisdom, the character of good women is revealed to have been represented as entwined with women's domestication in the traditional sayings. This has further been contextualised through one of the sayings in Sabiny local language shown in the quote:

Cheshet ambusan buree' kaa (FGD 6 Participant).

In English, this saying literally translates as 'a well-behaved woman stays at home'. Participants interpret this as women should dedicate their time to care for their homesteads, spouses, children, ensure there is food and the home is well managed. It was also stated to involve supporting spouses to create and maintain wealth by engaging in agricultural activities and caring for animals. Women who exhibit good character as prescribed by culture and are perceived to dedicatedly care for their homesteads and family members are a source of respect and honour to their husbands. Additionally, they are considered role models in society irrespective of their marital status (married or widowed). This demonstrates how some cultural norms appear plausible and rewarding whilst constructing gender inequities that inhibit women's adaptation decisions. The detrimental effects of domestication on women's adoption of various adaptation strategies have been recognised in scholarship with more emphasis on its limitation on women's ability to take advantage of adaptation

opportunities outside the domestic spheres (Bikketi *et al.*, 2016; Farnworth *et al.*, 2023; Niemann *et al.*, 2024; Njuguna *et al.*, 2016; Tamale, 2004).

In line with the domestication of women, culture defines the acceptable standards of behaviour for women. Women are expected to be obedient, respectful, and submissive to male spouses, clan leadership and elders in the society. The elderly (female and male) are believed to have the power to bless or curse. It is for this reason that they are respected although elderly men are more respected than the elderly women. Elderly women are also expected to exhibit good character by undertaking domestic work and keeping within the confines of the homestead like their younger women counterparts. This shows that cultural norms still restrict the decisions and actions of women even at old age. Additionally, this illustrates the complex gender inequities in responsibilities that women deal with despite their age. Women's good behaviour is also culturally interpreted in terms of not seeking the intervention of relevant authorities (cf. section 5.3.2). This aligns with some interpretations of women's good behaviour on the basis of being non-proactive, silent, calm, and enduring oppression stated in the literature (Alordiah *et al.*, 2022). This evidence signifies that cultural norms largely advance women's subordination. Such subordination undermines women's socio-economic empowerment despite the opportunities available for women to advance their interests and needs.

Furthermore, certain actions are reported as culturally abominable to women. Two of these acts are described in the extract below:

In our culture, it is an abomination for a woman to sit on a chair when a man is standing. And it is also not acceptable for women to eat at the same table with men. They are supposed to eat with children in the kitchen and while seating on a mat. A woman who engaged in these acts is considered grossly disrespectful and a disgrace to her husband and family (FGD 4 participant).

The extract exposes the intricate traditional rules that women have been and still are subjected to which ratifies women's inferior social positions. Even though these norms are changing due to the effects of education, interactions, technology and life experiences, it is noted that they are still valued and utilised to define women's behaviour in the household and society. Defining women's behaviour on the basis of the above aspects contribute to generalisation of women's abilities and stereotypical attitudes which perpetuates asymmetries in gender relations and jeopardise women's adaptation decision-making abilities (Brion and Ampah-Mensah, 2021; Heintz, Kabeer and Mahmud, 2018).

The negative effects of cultural norms on women's behaviour and the ability of women to question their partners, the clan and even seek the intervention of state and private authorities is evidenced in the data. The preservation of family relations is widely reported to explain women's reluctance in seeking answers whenever they have issues or reported matters to the clan but felt they had not been conclusively addressed. This experience is recapitulated in the interview extract below:

When I lost my husband, one of his brothers wanted to take over part of our land in the wetland and threatened to harm me if I resisted. When I reported the matter to the clan head, a meeting was convened, and the members just focused on advising us to forgive and support one another instead of addressing the real problem. Even though he eventually stayed away from our land, he continues to threaten me and my children, that is why I am not happy with the way the clan addressed the matter. But I had nothing to do other than thank them for intervening because if I was to question them, they would refer to me as ungrateful and disrespectful (Participant 7).

This quote demonstrates the limitations of cultural rules in addressing issues that concern women by prioritising family relations. Furthermore, it shows how cultural norms reinforce women's subordination through the negative portrayal of women who

question processes and practices as ingrates and disrespectful. This aligns with the argument that men domination of societal and familial structures perpetuate physical, emotional, and psychological violence against women and advances the interests and priorities of men (Ali *et al.*, 2010; Diarra *et al.*, 2021; Diouf *et al.*, 2019; Jost *et al.*, 2016; Mudege *et al.*, 2017; Tanjeela and Rutherford, 2018). However, as shown in the previous Chapter, a few women hardly conform to certain cultural norms about women's behaviours such as not involving relevant authorities in addressing their concerns (cf. section 5.2). The achievements of these few women such as liberty to access and utilise family land were reported to have been a source of inspiration to other women to pursue agency. This finding is substantiated by key informant interviews which reiterate that women draw their encouragement to act against cultural injustices from each other. In FPE's arguments, women are recognised to act against injustices that are gender-based, related to social hierarchy, subordination and the oppression of women (Rocheleau *et al.*, 1996). These results show the likelihood of more women defending themselves overtime and to resist cultural related injustices that threaten their wellbeing. This is congruent with the argument that women navigate cultural norms and beliefs in relation to their changing socio-economic circumstances (Brion and Ampah-Mensah, 2021; Cislighi, 2018).

Patriarchal rules upheld and often reinforced by male household heads

It was stated that male household heads based on their traditional mandate as owners and controllers of household resources set rules and regulations that guide tending animals and the utilisation of crop produce. These rules are pronounced to women partners whilst others are implied through the actions and responses of male household heads to different situations. Women are responsible for ensuring that children and other household members comply with family rules set by men partners.

This is different in female-headed households where rules that guide the utilisation of most resources are set and executed by female household heads. The non-land related family rules revolve around selling agricultural produce, reservation of produce for food and caring for animals. Strict enforcement of rules applies largely on resources that men attach strong social and economic significance such as animals (cattle, goats and sheep) and certain crops (coffee and rice). With respect to animals, a participant shared the rules her husband set in the quote below:

In my home, we have cows, goats, and sheep which my husband bought using our earnings from agriculture, but he set strict rules for their upkeep and sale. No one other than him can sell any animal, animals are supposed to drink water twice a day (12:00pm and 4:00pm) and fed until they get satisfied. Goats and sheep are not to be left under rain and to be in their shelters by 6:00pm. In cases where animals are unwell, he is supposed to be informed immediately. Whenever the children and I flout any of these rules, he insults us using all sorts of foul language and sometimes becomes physically violent (Participant 22).

This quote represents the traditional division of gender responsibilities whereby men use their power to establish rules in alignment with their interests whilst women execute those rules. Furthermore, it also reveals stereotypical attitudes about women's inability to independently assess and decide how best to manage family resources especially those that are of specific interest to men. This reinforces unequal social positions of women and men in households and gender disparities in intra-household gender relations. The FPE arguments associate gender power imbalances between women and men and the power that men such as male household heads possess to solely establish family rules to patriarchy (Elmhirst, 2015; Rocheleau *et al.*, 1996). The patriarchal rules upheld and reinforced by male household heads curtail women's ability to undertake autonomous decisions that involve using family resources to adapt to climate change. This is contingent with the observation that people with power such as male household heads make decisions informed by their

interests (Deschênes, Dumas and Lambert, 2020; Eriksen and Lind, 2009). This power manifests in the form of rules that male household heads set to guide how family members access and utilise animals and other family resources even in female-headed households.

Rules of informal savings and lending groups

Women mostly rely on informal savings and lending groups to finance their farming activities and implementation of adaptation measures. This corresponds with the argument that informal groups provide strong social networks for women farmers to adapt to climate variations and reduce common vulnerabilities (Perez *et al.*, 2015; Reed, 2017). Women participants explained that they belong to different groups but share similar experiences because the groups have similar rules and regulations. These groups are Bagwere Tukulakulane, Tukola Basaka, Sukut multipurpose, Namagongolo women's group, Chechac Satka, Irabi Tukungane and Tastaii. In a focus group discussion, members of Namagongolo women's group shared the rules that govern the operation of their savings and lending group presented in Table 5.

Table 5: The rules of Namagongolo women's group

Rule categorisation	Specifics of rules
Group membership	Voluntary membership and members are from the same geographical location
Leadership	Five trusted members of the committee (chairperson, vice chairperson, treasurer, general secretary and secretary publicity), elected by group members
Meetings	Weekly meetings, members encouraged to attend meetings, remittance of savings, loan repayments and decisions are undertaken during meetings
Saving and lending	Minimum savings Ugs1000 (\$ 0.26) per week, lending internally to group members on first come and first serve basis, loan repayment at 10% monthly interest rate, money kept in a lockable cash box and dividends shared after 12 months

Source: Members of Namagongolo women's group (FGD 5) (2022)

In other groups, similar rules to that of Namagongolo women's group are revealed in this quote:

For members to get credit from most groups, they are required to be registered and active members, saving weekly a minimum of Uganda shillings 1000 (\$0.26), should not have an outstanding loan and have a good credit record within the group (FGD 3).

The rules presented in Table 5 and the quote above depicts women's consideration of their unique challenges and needs when formulating group rules. These challenges consist of low income levels and the burden of addressing family welfare needs that sometimes require emergency funding. Rules such as setting affordable minimum savings rate and quick access to funds moderate women's financial limitations and improve their abilities to adapt to climate change. To affirm the significant role of the rules of informal savings and lending groups in improving women's financial access, some key informants reiterated the restrictive rules of accessing formal credit such as seeking approval from male partners (cf. section 6.1.1). To ensure regular cash flow for addressing the financial needs of group members, loan repayments are scheduled and enforced. But still, if a member defaults due to unprecedented financial hardship emanating from low agricultural outputs, sickness or death, participants explained that they are not penalised. The loan repayment is rescheduled and members are permitted to pay it off in fractions that are manageable to them. But due to some members abusing such provisions, it was reported that the executive first establishes the authenticity of members situations before making any adjustments to their loan repayment schedules.

Rules that concern voluntary membership and attendance at group meetings were cited by respondents to promote members' commitment, inclusiveness, collective decision-making and stronger social networks. Despite the usefulness of meetings,

some women are incapable of attending regularly due to domestic chores and spousal restrictions (cf. section 5.1.2). Moreover, some women are stated to normally leave before the meeting concludes so as to avoid conflicting with their spouses. Such flexibility in rules contributes to majority of women gaining membership. Much as the rules of informal savings and lending corresponds with Uganda's operational guidelines for self-help groups (2022) and appear to have basic structures like formal groups (Mutebi *et al.*, 2017), they function quite differently. As noted earlier, the operations of informal groups are characterised by mutual trust and some degree of flexibility depending on the unique circumstances of their members. It is for this reason in part that group finances are kept in cash boxes and not in banks or mobile money accounts as reported by women farmers. The connection between informal rules and members' participation in informal financial groups has been attributed to non-stringent rules that improve access to credit (Musinguzi, 2016; Theophilus and Paul, 2019). Women's reliance on informal savings and lending groups relate to the arguments in FPE's earlier work about women collectively working to address environmental related concerns that impose threats on their survival although it mostly emphasises activism and movements (Rocheleau *et al.*, 1996). The evidence above aligns with the observations in previous studies about women depending on their collective initiative to address gender resource related imbalances and moderate shared livelihood vulnerabilities (Perez *et al.*, 2015; Reed, 2017; Rocheleau *et al.*, 1996).

In summary, the findings above show that formal and informal gendered institutions interconnect with intra-household gender relations and impact adaptation decisions of women. The evidence in this section exemplifies positive and negative interconnections with intra-household gender relations and influences on women's adaptation decision-making. Most formal gendered institutions such as the Land

(Amendment) Act 2010, Succession Act 2000, NAES principles and rules of IFDC positively interrelates with intra-household gender relations. This interrelationship produces positive implications on the capacities of women to make adaptation decisions. This differs from the majority of informal gendered institutions such as cultural norms and patriarchal rules upheld and enforced by male household heads which negatively interconnect with intra-household gender relations and impose negative implications on women's climate adaptation decision-making. This signifies that formal and informal gendered institutions configure the decisions that relate to addressing environmental problems such as climate change (Elmhirst, 2015; Kabeer, 1994; Rocheleau *et al.*, 1996). Such workings of gendered institutions and their linkages to women's adaptation decisions correspond with FPE's arguments about the interconnectedness of all life including aspects such as institutions which represent different power structures and environmental decisions (Elmhirst, 2015; Harcourt *et al.*, 2023; Rocheleau *et al.*, 1996; Truelove, 2011; Vercillo, 2022). It can therefore be observed that formal and informal gendered institutions interact with each other and produce implications for women's adaptation decision-making. The interactions between formal and informal gendered institutions are explored in the next section.

6.2 Interactions of gendered institutions

The discussions in this section concentrates on the different ways in which formal and informal gendered institutions interact with each other. Accommodation, competition, complementarity and substitution interactions are explored. The exploration of these interactions contribute to the comprehension of how these interactions moderate intra-household gender relations in ways that they enable or constrain adaptation decisions of women farmers.

6.2.1 Accommodation interactions

Some interactions between formal and informal gendered institutions are accommodative and more pronounced than competition, complementary and substitution interactions. These interactions were majorly demonstrated when addressing land and physical violence disputes. Informal gendered institutional actors such as clan leaders were reported to openly agree with the provisions in the formal gendered institutions such as the Land (Amendment) Act and the Succession Act on gender equity on access and control over land. But they were stated to implicitly downplay formal gendered rules by portraying such rules as less useful in addressing gender relations concerns that relate to land and other property in households. This has been evidenced through cultural leaders advising women not to seek the intervention of formal gendered institutions to resolve their family issues. Results show that women are instead encouraged to report their concerns to the clan or close relatives to safeguard the family, its cohesion and stability from the external interferences of formal gendered institutional actors. This advice was stated to permeate the resolution of land disputes even by the village and parish level Local Council courts.

Although the approach used by clan leaders to offer this advice seemed positive, calm and with good intentions towards women, participants provided contrasting views. They noted that advice from clan leaders aims at discouraging women from seeking help from higher state and private authorities. Participants associated these restrictions to the fact that state and private authorities focus on empowering women which deviates from cultural norms and the interests of most male household heads. Clan leaders were observed to state that reporting men to other authorities has been caused by modernity and gender equality which contradicts cultural values systems

and corrupts women thus destabilising the family. This is congruent with the description of accommodation interactions whereby people are encouraged to act in ways that impede formal institutional outcomes such as gender equality (Helmke and Levitsky, 2004). A participant shared her experience with a clan leader and his advice in this quote:

I had a land issue with a brother to my late husband who has always disturbed me wanting to grab the land I farm near the wetland. I had planned to report him to the sub-county and police so that he is arrested because the clan has failed to resolve the issue. But when I spoke to one of the clan leaders, he discouraged me from seeking the intervention of other authorities. He said that man is your relative, he has children and wife so when he is arrested what will happen to your relationship and his family. People will perceive you as a bad woman. Just leave him, we shall continue talking to him to stop disturbing you (Participant 20).

To elucidate this further, other participants noted that married women are the most discouraged by both clan leaders and elderly women from reporting their spouses to state and other private agencies. The majority of elderly women encourage younger married women to preserve their marriage at all costs and not adopt modern behaviours of exposing their husbands' weaknesses to the sub-county, police or organisation officials that support women. This associates with the cultural expectation of women to exhibit good character such as being non-proactive, tolerating oppression and battering in some cultures (Alordiah *et al.*, 2022; Rotimi, 2013). Additionally, the strong emphasis on preserving marriage was attributed to the belief that women with failed or dysfunctional marriages are regarded as cursed by their forefathers never to settle in marriage and raise their children. Such traditional norms contribute to women prioritising their domestic responsibilities and not attending agricultural training even though NAES principles and IFDC rules provide programmes that purposefully target women. Based on these perspectives, formal gendered institutions are portrayed to contradict cultural value systems and to endanger families which the majority of

women are observed to value. This contributed to some women being reluctant to seek the formal gendered institutions to address their gender relations concerns. This result aligns with the argument that through accommodation interaction, informal rules contradict the 'spirit but not the letter' of formal rules (Helmke and Levitsky, 2004, p. 729).

Much as the advice given to women does not directly label those who seek or express the desire to seek the interventions of formal gendered institutions negatively, it impedes the realisation of gender equities. The negative connotations that inculcate attitudes that reinforce women's endurance of oppression and non-proactiveness were stated to have been engrained in different counsels. In relation to SRA arguments, this perpetuates the normalisation of gender inequities and its devastating effects on women farmers (Kabeer, 2004; Kabeer, 1994). Inhibiting women from soliciting help from formal gendered institutions such as the Land (Amendment) and Succession Acts negatively correlates with intra-household gender relations. It reinforces disparities in women's access and control over resources, division of responsibilities and power and its consequent effects on their adaptation decision-making. This evidence illustrates that the behaviours of institutional actors and that of institutional beneficiaries configure institutional outcomes (Hodgson, 2006). These outcomes can be the negative consequences of accommodation interactions of gendered institutions on intra-household gender relations and its hinderances on the capacities of women to make adaptation decisions.

In some cases, some formal institution actors especially the police were stated to implicitly discourage women from finding help from formal gendered institutions. Although some of the motivations to discourage women are informed by cultural

norms, some were found to have been linked to individual and selfish motives such as bribery. These perspectives represent some formal gendered institutions negatively and thus discouraging women from seeking help that can improve their access to resources and ability to determine their own adaptation priorities. As noted in the scholarship on institutions, insincerity and corruption are stated to hinder the positive outcomes of interactions of gendered institutions (High *et al.*, 2006; Valdivieso, Andersson and Villena-Roldán, 2017; Whaley, 2022). These results highlight the interconnections between the non-official practices of formal gendered institutions and intra-household gender relations in consonance with SRA's perspectives on the effects of non-official institutional practices on gender relations (Kabeer, 1994).

6.2.2 Competition interaction

The second most pronounced interaction between formal and informal gendered institutions is competition interaction. Similar to accommodation, competition is exemplified through informal gendered institutions such as cultural norms ignoring formal gendered institutions. However, the point of departure from accommodation is that contradictions with respect to the Land (Amendment) Act, Succession Act, NAES guidelines and FTB's regulations on women's loan access are explicitly practiced by informal gendered institutional actors such as clan leaders and male household heads. This has been exemplified through women's cultural denial of land inheritance, men's exclusive rights to own land and the power to control land and women's domestication.

Evidence shows that in the majority of households, women rarely inherit land. Women's restricted inheritance of land is connected to cultural norms that demarcate ownership of land through inheritance majorly to the men (cf. section 6.1.2). Additionally, women's continued access to matrimonial land after the demise of a

spouse is contingent to women having had children with the deceased or remarrying a close relative to the deceased such as a brother or cousin. Moreover, in cases where widows are permitted to cultivate on family land, close relatives of the deceased and the clan are culturally mandated to oversee the utilisation of the land by widows and engage in big decisions that concern land utilisation. These results illustrate competition interaction in that the cultural norms discussed above violate some provisions of the Succession Act 2000 (Chapter 162) which provides for women's inheritance of their deceased partner's property including land. In addition, the cultural norms that inhibit women's land inheritance undermines their access to FTB's agricultural loans that target women. This imposes negative consequences on the capacities of women to make adaptation decisions. In previous studies, cultural norms have been explained to conflict with formal rules on gender and land rights exacerbating gender inequalities (Doss *et al.*, 2018; Etale and Simatele, 2023; Kristjanson *et al.*, 2017; Ramarosan *et al.*, 2022).

On the account of culturally ascribed positions as landowners and controllers, competition interaction is exemplified through some male household heads leasing land without the consent of their female partners. This illustrates cultural norms facilitating the violation of some of the provisions of the Land (Amendment) Act 2010 which regulate transactions that concern family land such as partners mortgaging or leasing land without prior consent of the other spouse. Another demonstration of competition interaction is revealed through the cultural demarcation of the 'domestic sphere' to the women and the 'public sphere' to the men (cf. section 6.1.2). Based on this, male household heads are assigned the mandate to attend agricultural training that are mostly undertaken in public spaces while women undertake productive and reproductive work within the homestead. This cultural domestication of women violates

NAES principles on inclusive participation of female and male farmers in agricultural extension programmes such as training and access to farming inputs. This sabotages the realisation of gender equity in agricultural training, knowledge and skills acquisition and access to farming inputs.

The afore discussed results exemplify competition interaction evidenced through informal gendered institutions violating formal gendered institutions thus perpetuating asymmetries in intra-household gender relations. This reinforcement of gender inequities deviates from the desired outcomes of formal gendered institutions, the advancement of gender equity in intra-household gender relations and adaptation decision-making. The generation of outcomes that depart from those intended by formal institutions align with the interpretation of competition interaction outcomes documented in previous studies (Helmke and Levistky, 2004; Wang, 2020). Therefore, competition interaction contributes to women's limited access and control over resources such as land, agricultural training and inputs. This aligns with SRA's arguments about institutional interactions constraining or enabling people's actions (Kabeer, 1994). In the context of this study, competition interaction produces outcomes that constrain the abilities of women to make adaptation decisions and restrict women's adaptation options to a few strategies which they can implement whilst relying on resources accessible to them. For instance, women can only practice wetland or riverbank farming, plant improved seeds or manage pests using pesticides depending on their access to resources that facilitate the implementation of the above adaptation measures. The adaptation strategies adopted by women are discussed in detail in the next Chapter.

6.2.3 Complementary interaction

The evidence of complementary interaction between formal and informal gendered institutions is shown through institutional actors working together to execute rules. Complementary interaction has been exhibited through formal and informal gendered institutional actors coordinating and collaborating with each other to resolve domestic disputes such as those that relate to land, physical violence and access to formal credit. In accordance with the Local Council Courts Act 2006, the sub-county, parish and village local councils coordinate with each other to resolve land related issues of women. Beyond the official establishments of the Local Council Courts Act 2006, results show that it is a norm for the clan, most especially the head of the clan to be co-opted in meetings that resolve domestic issues at parish and village levels. The co-option of clan heads happens in cases where a clan head is not a member of the parish or village council. The common issues that local council courts address majorly concern land grabbing by relatives and male household heads leasing or mortgaging family land without the consent of their spouses. Even in cases where women report issues to the sub-county without involving the parish, village council and clan leaders, the sub-county refers the matter to the lowest authority first, the village local council. A key informant explained how the sub-county addresses land issues that women report directly without seeking prior help from the parish, village council or clan in this extract:

Some women especially widows prefer reporting land issues to the sub-county even before involving the clan, village and parish councils. With such cases, the sub-county first refers the matter to the clan and then the LCI. This ensures that the matter is addressed systematically and peacefully from the grassroot. If the lower authorities fail to resolve the issue, it is then forwarded to the sub-county (Key informant 3).

The extract illustrates that sub-counties comply with rules of the Local Council Courts Act that situates local courts at village or parish level as first instance courts for resolving land issues. Moreover, referring women with domestic issues to the clan even though it is not an official requirement illustrates coordination and partnership between formal and informal gendered institutions. This signifies institutional actors working together to address gender concerns thus illustrating complementary interaction. This evidence aligns with SRA arguments that non-official practices of formal institutions facilitate interactions between formal and informal institutions (Kabeer, 1994).

Complementary interaction manifests positive interrelationships with intra-household gender relations although this evidence is less pronounced. Through coordination and collaboration between the district, sub-county, local council I and the clan, issues that relate to male household heads leasing or mortgaging land without the consent of women partners, relatives of deceased partners grabbing land and physical violence are addressed. This collaboration between formal and informal gendered institutional actors contribute to the resolution of some domestic concerns through apologies, forgiveness and those accused pledging to desist from antagonising those aggrieved. This slightly enhances some women's access to land and participation in family decision-making thus imposing positive effects on women's adaptation decision-making capacities. This substantiates observations made in previous studies about the positive linkages between complementary interaction evidenced through institutional collaboration and effective implementation of adaptation strategies (Amaru and Chhetri, 2013; Eriksen and Selboe, 2012).

Despite the positive contributions of complementary interaction, the involvement of clan leaders in parish and village councils is noted to greatly skew benefits to the advantage of men. This has been linked to the resemblance between the remedies employed by local council courts and cultural norms such as forgiveness and reconciliation in conflict resolution and the involvement of clan leaders in local courts. As a result, women participants observed that parish and village council courts unsatisfactorily resolve gender concerns. With respect to access to formal credit, complementary interaction manifests through women seeking the approval of male spouses in order to access FTB's women's agricultural loans. Women seek authorisation from male household heads in correspondence with FTB's rules for accessing credit such as providing sufficient collateral such as land which is commonly owned by male household heads (cf. section 6.1.1). Much as it is uncommon for women to access formal credit, a few try to gain access but have been constrained by lack of collateral and spousal authorisation as illustrated in this excerpt:

After learning that FTB gives women loans for agriculture, I thought of getting a loan to hire land for farming. When I met the credit officer, he said I need security and my husband's consent. Since I had not shared my intentions with my husband and did not want him to know because he would not accept, I just gave-up the idea (Participant 10).

This excerpt demonstrates how the rules of FTB perpetuate disparities in women's access to financial resources despite its overall objective of addressing gender inequities in formal credit access. This highlights the significance of gendered institutions consciously identifying and addressing other intersecting factors that may compromise the realisation of desired outcomes such as cultural norms. Related to complementary interaction exacerbating gender inequalities in land access as discussed previously, FTB's rules are observed to reinforce cultural norms about men's superiority, demarcation of power and the assignment of decision-making

responsibilities to the men. This has been advanced through conditions that require women to provide collateral and provide consent from male household heads. In this way, gender disparities in women's access to credit to fund climate adaptation are exacerbated. In agreement with SRA perspectives, it can be argued that even though institutions appear to be gender sensitive officially, the execution of rules can generate contradicting outcomes such as perpetuating gender asymmetries. These results demonstrate strong negative influences of informal gendered institutions in complementary interaction. This supports the argument that informal rules are the bedrock for executing formal rules (Helmke and Levitsky, 2004). Complementary interaction can therefore be noted to largely regenerate gender disparities in intra-household relations producing adverse implications on women's abilities to make climate adaptation decisions.

6.2.4 Substitution interaction

Substitution interaction was majorly evidenced through the rules of informal savings and lending groups filling gaps in women's access to farming inputs and formal credit. These gaps were associated with the drawbacks of NAES principles, rules of IFDC and those of FTB on women's access to agricultural credit. Despite these gendered institutions aiming at enhancing women's access to resources critical for agriculture and climate adaptation, evidence demonstrates their contribution to gender inequities in resource access. Substitution interaction was exemplified through the rules of informal savings and lending groups enhancing women's access to credit to fund the implementation of their adaptation strategies in the place of formal gendered institution such as NAES principles and FTB rules. This can further be interpreted as informal gendered institutions replacing formal gendered institutions with the aim of achieving outcomes that are compatible with those of formal rules such as gender equity in

resource access and climate response (Helmke and Levistky, 2004). As discussed previously, women use money borrowed from informal savings and lending groups to purchase agricultural inputs and implements such as hand hoes, pesticides, seeds and to address welfare needs during extreme climate conditions (cf. section 6.1.1). This accounts for the centrality of the rules of informal savings and lending groups in women's climate adaptation decision-making in comparison to formal gendered institutions such as NAES principles and FTB's rules on access to women's agricultural credit. Women's strong reliance on informal groups to access resources that facilitates climate adaptation has been documented in previous studies in line with the findings of this study (Lawson *et al.*, 2020; Nyberg *et al.*, 2021; Van Aelst and Holvoet, 2016).

Even though substitution interaction positively contributes to women's access to credit, its outcomes are stated to have been undermined by cultural norms such as those that ascribe men the power to control resources and the actions of women. This results to women's restricted participation in group meetings and loss of savings whilst some rarely gain membership due to the restrictions of their male partners. Such limitations constrain the realisation of gender equity through informal savings and lending groups in agreement with SRA arguments about institution interactions constructing asymmetrical intra-household gender relations (Kabeer, 1994). Much as my study majorly focuses on interactions between formal and informal gendered institutions, the effects of cultural norms on the outcomes of informal savings and lending groups signifies the negative outcomes of informal gendered institutions interacting with each other. Informed by these results, it can be argued that gender disparities in intra-household relations are evident in substitution interaction of gendered institutions. This evidence affirms the durability of informal gendered institutions and the dynamic ways

through which institutions configure adaptation decisions of smallholder women farmers (Hodgson, 2006; Lowndes, 2020; Waylen, 2014; Whaley, 2022). These configurations are explored in depth in Chapter seven. A summary of the forms of formal and informal gendered institution interactions and their influence on women's adaptation decisions is presented in Table 6 below.

Table 6: Summary forms of gendered institution interactions

Forms of institution interactions	Definition: Forms of institution interactions	Influence on women's adaptation decisions
Accommodation	Informal institutions tolerate formal institutions by refraining from directly violating formal rules	Restricts women from seeking support from formal gendered institutions to address asymmetries in resource access and control, division of responsibilities and power. Reinforces asymmetry in intra-household gender relations thus constraining women's capacities to make adaptation decisions.
Competition	Informal institutions violate and ignore formal rules	Ignores gender equity provisions of formal rules by: • denying women access and control over resource (Land, agricultural training, climate information), • disproportionate division of productive and reproductive responsibilities. • circumscribing decision-making power to males. Perpetuates inequity in intra-household gender relations that constrain adaptation decision-making abilities of women farmers.
Complementary	Collaboration between formal and informal institutions to address	Coordination and collaboration between formal and informal institutional actors to resolve gender

	deficiencies of formal institutions	resources, responsibilities and power concerns. Positively interrelates with intra-household gender relations, improving the abilities of some women farmers to make adaptation decisions. Some informal gendered institutions (cultural norms), gender insensitive rules and individual characteristics of formal and informal institutional actors compromise the positive effects of complementary interaction on adaptation decision-making capacities of women farmers.
Substitution	Informal institutions replacing formal institutions with the aim of achieving outcomes compatible to those of formal institutions	Rules of informal savings and lending groups enhance women's access to financial resources to fund implementation of adaptation strategies. Some informal gendered institutions (cultural norms) restrict women's participation in groups activities and gaining membership, undermining women's access to finances and adaptation decision-making capacities.

Source: Researcher (2024)

6.3 Conclusion

Results in this Chapter disclose the Land (Amendment) Act 2010, Succession Act 2000, Local Council Courts Act 2006, NAES principles, rules of IFDC and FTB as formal gendered institutions. These formal gendered institutions largely focus on enhancing equity in intra-household gender relations with respect to resources, responsibilities and power. In terms of informal gendered institutions, cultural norms,

patriarchal rules upheld and enforced by male household heads and the rules of informal savings and lending groups are revealed. Of these informal gendered institutions, rules of informal savings and lending groups align more with advancing equitable intra-household gender relations in comparison to cultural norms and family rules set by male household heads.

The interactions between formal and informal gendered institutions mostly interconnect negatively with intra-household gender relations. In accommodation and competition interactions, negative interconnections with intra-household gender relations are mostly exemplified through informal gendered institutions ignoring formal gendered institutions. This slightly differs from complementary and substitution interaction where a few positive interlinkages with intra-household gender relations are demonstrated. However, the strong mediating effects of informal gendered institutions such as cultural norms are evidenced to compromise the positive outcomes of complementary and substitution interactions on intra-household gender relations and its consequent effects on women's adaptation decisions. These results demonstrate that the interactions between formal and informal gendered institutions mostly reinforce and reproduce gender inequities in intra-household relations. This imposes negative implications on the abilities of women farmers to make adaptation decisions. The interlinkages between the interactions of gendered institutions and intra-household gender relations portend connections with adaptation decisions of women farmers. This Chapter on gendered institutions and their interactions inaugurates Chapter seven which centres on adaptation decisions of smallholder women farmers.

CHAPTER SEVEN: ADAPTATION DECISIONS OF SMALLHOLDER WOMEN FARMERS

7.0 Introduction

The interactions between gendered institutions and their interconnections with intra-household gender relations are established to associate with adaptation decisions of women farmers in Chapter six. This Chapter explores the configurations of adaptation decisions of women farmers through the interactions of gendered institutions. Adaptation decisions are conceived in terms of the adaptation strategies, methods of implementing adaptation strategies and adaptation intensities (using more than one adaptation strategy) that women decide to adopt. These examinations are undertaken with the guidance of FPE perspectives to understand how the interactions between gendered institutions and their outcomes in intra-household gender relations enable or constrain adaptation decisions of women farmers. To establish a contextual foundation, the Chapter commences by exploring women's experiences with climate change. These explorations show commonalities and variations in women's interface with climate change across different months. In this way, the discussions contribute to a nuanced comprehension of contrasts in adaptation decisions of women farmers. This is then followed by the examination of adaptation decisions whereby on-farm and off-farm adaptation strategies employed by women farmers are explored. Within these examinations, the different ways that women implement adaptation measures and the adaptation strategies that women collaboratively use to moderate the effects of climate change are interrogated.

In analysing the adaptation decisions of women farmers, this Chapter builds on results in Chapters five and six whilst engaging FPE's perspectives. The FPE perspectives

that my study engages with pertain to the contributions of formal and informal institutions in constructing gender differences in access to and control over resources, division of responsibilities and power and their linkages to adaptation decisions of women farmers. This Chapter is structured in three sections. In section 7.1, changes in the climate and the experiences of women farmers with these changes are explored. These experiences majorly relate to climate disturbances and their effects on the livelihoods of women farmers. Section 7.2 concentrates on on-farm and off-farm adaptation strategies employed by women farmers, the manner in which these strategies are implemented and the strategies that women integrate in their adaptation efforts. In these discussions, the aspects that women consider when deciding how to cope with the detriments of climate change are explored. Lastly, section 7.3 provides the Chapter conclusion synthesising key results and the nuances that construct adaptation decisions of smallholder women farmers.

7.1 Climate change and the experiences of women farmers

Climate change is largely experienced through changes in rainfall patterns characterised by floods, droughts, dry spells and pests and diseases. Most of these experiences are common amongst women farmers although with slight variations. The commonalities in women's climate experiences are consistent with the argument that climate change imposes similar effects on women due to semblances in their socio-economic susceptibilities (Cohn *et al.*, 2017; Davidson *et al.*, 2012; Graeub *et al.*, 2016; Jost *et al.*, 2016). These susceptibilities relate to the small land sizes that women cultivate, low income levels, reliance on rain-fed agriculture, limited farming inputs and implements (cf. section 5.2).

On the other hand, the variations in women's experiences with climate change are associated with their differing levels of climate vulnerabilities and adaptation capacities. These variations contribute to a few women experiencing relatively fewer devastating effects of climate change in comparison to the majority. In alignment with discussions in Chapter five, variations in women's climate experiences are shaped by disparities in women's social characteristics such as marital status, family headship, resource endowment, geographical location and the topography of farmland. These variations contribute to a few women demonstrating better climate change adaptation capacities such as appropriately implementing measures that they adopt than the majority of women. Women with improved adaptation capacities have better opportunities to determine their adaptation pathways in a bid to effectively alleviate the adverse effects of climate change such as dry spells and flooding on their livelihoods than those with constrained capacities. The reported changes in the weather are represented in Table 7 reflecting changes and their manifestations across months. These changes were established with the aid of gender disaggregated seasonal calendar utilised to collect data.

Table 7: Weather variations experienced by smallholder women farmers

Weather changes	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Rainfall Patterns		S R	S R	H R	H R		H R	H R	H R	H R	S R	S R
Floods				L F	I F	I F	L F			I F	L F	
Dry spells	S D	S D	L S			L S				L S		S D
Pests and diseases				F D	P D	P D	F D	F D	P D	F D	F D	

Source: Gender disaggregated seasonal calendar (2022)

Key

S R	Scattered rainfall
H R	Heavy rainfall
I F D	Intense flooding on the dry land
L F D	Less flooding on the dry land
I F W	Intense flooding in the wetland
S D	Severe dry spell
L S	Less severe dry spells
P P D	Peak of pests and diseases
F P D	Few pests and diseases

7.1.1 Rainfall patterns

Rainfall patterns are revealed to have changed over the past three decades indicating increased rainfall unpredictability. In Table 7, it is shown that rainfall that commences planting normally falls in March with light and scattered showers. These showers become heavier and relatively consistent in the months of April, May, July, August, September and part of October. But over the years, variations have been noted. Variations with respect to the onset and cessation of rainfall are observed across years. For instance, in 2022 there was an early onset of rainfall in February. But any rainfall that presently commences in February as it was in 2022 is described as very variable and unable to support planting. This contradicts the characteristics of rains that commence in February more than one decade ago because such rains marked the beginning of the farming season. Additional variations are disclosed in connection with previously rainy months (October, November and December) presently earmarked with light and scattered showers (cf. Table 7). The rainfall changes in these months are stated to have contributed to uncertainties in the commencement and conclusion of the farming seasons. The variability of rainfall and its effects on agriculture have been recognised in previous studies with rainfall noted to have

become erratic and catastrophic (MWE, 2015; Monerie, Biasutti and Roucou, 2016; Wainwright *et al.*, 2021).

Uncertainty about the onset of rainfall and its effects on the commencement of the farming season is attributed to women's limited access to weather forecasts. Disparities in women's access to climate information such as weather forecasts have previously been explored and allied to the interactions of gendered institutions (cf. section 6.3, 5.1.1). Since women are predominantly responsible for addressing food needs in most households because this forms part of their reproductive roles (cf. section 5.2.2), uncertainty about the farming seasons complicates the realisation of this responsibility. This is because the ability of women to practice early planting and cultivating fast maturing crops to enhance food availability in the face of climate adversity is inhibited. Delays in the commencement of farming seasons fosters women to cook seeds as food in response to food scarcity. The eating of seeds and its contribution to food insecurity and depiction of poor welfare conditions is observed in other studies (Sasson, 2012; Shiva, 2009).

In cases where the onset of rainfall delays or disappears for a long time during the farming season, participants report that such rainfall is commonly catastrophic during its onset and resumption. It is stated to fall heavily accompanied by strong winds, thunderstorms and hailstones which destroy crops, houses, kill animals and cause soil erosion. The heavy surface runoff is also observed to wash away and bury germinating seeds in compacted soil. This is noted to contribute to low yields of crops such as beans, cowpeas, cassava, bananas, millet and sweet potatoes, which were stated to be staple food (cf. section 4.2.2). This is congruent with studies that have reported more than double average rainfall in East African countries and ascribed high

fluctuations in rainfall to poor livelihoods (Batisani and Yarnal, 2010; Sutcliffe, Dougill and Quinn, 2016; Wainwright *et al.*, 2021; Wu *et al.*, 2016). The effect of heavy rainfall on germinating plants is illustrated in Figure 10 below. The figure shows soil erosion and buried groundnuts.

Figure 10: Erosion and germinating groundnuts covered by soil



Source: Field data from transect walk (2022)

7.1.2 Floods

Floods are stated to have been prevalent in the current decade, occurring in the months of April, May, June, July, October and within the first two weeks of November (cf. Table 7). Flooding is characterised by variations in levels of intensity and resultant effects on agricultural output. Intense flooding and its devastating effects are pronounced among women farming in low land areas and the wetlands whilst less intense floods are majorly experienced by women farming in the highlands. Intense floods are the most destructive, submerging and washing away crops, destroying houses, killing animals and causing landslides especially in highland areas. The effects of less intense flooding are mainly disruption of farming activities such as planting, weeding, harvesting and causing crops ready for harvesting to decay. Some

of the effects of flooding are illustrated in Figure 11 below. Variations in flooding intensities (cf. Table 7) signify contrasts in the effects of flooding on women in the lowland and highland areas with those in lowlands being more susceptible to flooding risks. Without downplaying women's shared vulnerabilities to flooding, differences in agroecological zones construct differing experiences of women farmers with flooding and other aspects of climate change and can also account for shared climate experiences between female and male farmers. These nuances allude that women consider their agroecological zones when deciding how to cope with flooding. It can be asserted that some experiences that women have had with flooding are diverse even though literature largely reports homogenous experiences (Dube and Mhembwe, 2019; Echendu, 2021; Gaisie, Adu-Gyamfi and Owusu-Ansah, 2022). These common experiences involve washing away crops and soil erosion as shown in Figure 10.

Figure 11: Water gullies cause by flooding



Source: Transect walk (2022)

7.1.3 Dry spells and drought

Dry spells and drought are found to have been experienced in varying levels. These two concepts – dry spell and drought – are sometimes used interchangeably despite their differences. The interchangeable use of dry spells and drought have been allied to semblances in their manifestations. For example, the onset and conclusion of drought is observed as difficult to determine (Okpara, Ogunjobi and Adefisan, 2022). Therefore, since dry periods are precursors to drought, the beginning of drought can be mistaken for a dry spell. While focusing on duration, intensities and effects on women, dry spells and drought experiences are explored distinctively.

Dry spells are experienced in the months of January, February, in the beginning of March, June and towards the end of October and December (cf. Table 7). Since the past decade, the dry season has been varied with respect to duration and temperature. It lasts longer than expected by about two or more weeks with women in lowlands reporting longer dry seasons compared to those in the highlands. With regards to temperature, the months of January and February are described as characterised by higher temperatures than the months of March, June, October, and December. Dry spells are reported as prevalent, exacerbating women's burden of food and water scarcity and low agricultural outputs.

With respect to food scarcity, it is largely pronounced during severe dry spells which occur towards the end of January, February and early March (cf. Table 7). Even though the end of March is normally rainy, participants report that food scarcity persists because farmers would have just commenced planting. It is for this reason that the majority of households are stated to depend on one meal per day until the first harvest, which normally starts in the month of May. Despite these experiences, the problem of

food scarcity is worse among women, who seldom employ adaptation mechanisms to improve agricultural outputs in the face of climate change. This demonstrates disparities in the adaptation capacities of women farmers explored later (cf. section 7.2). The correlation between adaptation capacities of women farmers and their vulnerabilities to climate risks such as food insecurity is documented in previous studies (Ackerl *et al.*, 2023; Adzawla *et al.*, 2019; Kovaleva *et al.*, 2022; Rao *et al.*, 2019).

Other than food, the responsibility of tending livestock by providing pasture and water (cf. section 5.2.1) alongside other domestic responsibilities like fetching water are more burdensome in the dry than in the rainy season. These burdens are linked to pasture and water scarcities. As a result, women walk for long distances in search for pasture and water and also queue for a long time, about three hours, before fetching water. It is found that children play pivotal roles in modulating the above burdens by helping women to look for pasture and to collect water. The majority of male household heads rarely participate in fetching water for the household except a few educated men who sometimes use motorcycles to collect water for their wives in the dry season. This may be linked to the influences of education such as mindset change, which contributes to some men household heads to overlook certain traditional gender division of roles. The involvement of a few men in collecting water for domestic purposes substantiate the argument that men are less involved in reproductive responsibilities despite women's engagement in productive work (Badstue *et al.*, 2020; Doss *et al.*, 2022; Lastarria-Cornhiel, 2008). These experiences denote that climate stresses such as dry spells and drought compound women's burden of fulfilling their gender responsibilities. But as discussed previously, these experiences are not delinked from the effects of the interactions of gendered institutions because they

reinforce gender inequities in division of responsibilities (cf. section 6.2). FPE perspectives associate the reinforcement of asymmetries in gender division of responsibilities to normative rules that disproportionately demarcate productive and reproductive responsibilities to females and males (Rocheleau *et al.*, 1996).

The experiences of women farmers with drought are less pronounced in comparison to dry spells even though the effects of drought are more devastating than that of dry spells. Drought is explained to take quite a long time to occur. It is disclosed that in the last five years no drought has been experienced. Participants reported that drought can take between ten to twenty years to recur. As a result, observations about the effects of drought such as famine, crop failures, loss of livestock, water scarcity and pests and diseases are drawn from the 1997 and 2005 droughts. These effects are reported to have been very severe in that farming seasons in the lowlands of Eastern Uganda, including my fieldwork area, were adversely affected. These droughts are recounted to have contributed to a reduction in the farming seasons from two to one season in 2005 and 2006. In response to the 1997 drought, it is established that communities living close to the wetland started farming and apportioning themselves land in the wetlands. Results show that districts across Uganda were impacted but the lowlands and semi-arid regions suffered the worst consequences with women being the most affected. Women struggled to provide food, water, wood fuel and to tend animals, with limited support from male partners. Due to women's inadequacies in addressing food needs in households, evidence reveals that the majority of households plunged into famine. The severe effects of these droughts on women are reported to have been linked to limited capacities to adapt to climate change through measures such as cultivating food in wetland or riverbanks and diversifying income sources by engaging in non-farm activities in comparison to male household heads.

The abilities of women to employ measures that safeguard their livelihoods from the effects of climate change can be stated to entwine with inequities in intra-household gender relations demonstrated in Chapters Five and Six.

Despite the scanty experiences of women farmers with drought in the present decade, key informants explain that the prevalence of prolonged dry spells and variability in rainfall (cf. section 7.1.1) are precursors to potential future droughts. Studies have anticipated frequency of intense droughts in the future across the majority of African countries including Uganda (Ayugi *et al.*, 2022; Haile *et al.*, 2020; Quenum *et al.*, 2019). This foregrounds women's future drought induced livelihood challenges and the relevance of being able to make decisions about how well to adapt to climate change.

7.1.4 Pests and diseases

Pests and diseases are stated to have been prevalent since 2013 with crops being infested from the time they start germinating until they are harvested. This is observed to occur across the first and second farming seasons, that is from April to November. However, the problem of pests and diseases are noted as mostly pronounced in the months of May, June and September classified as the peak (cf. Table 7). Participants observe that while growing up in the 1980s and 1990s, crops were infested by pests and diseases, however they were less prevalent and less destructive. This is stated to have remarkably changed with pests and diseases being more prevalent and devastating. Participants largely associate these changes to climate change although other factors such as introduction of new crop varieties and agronomic practices are documented to contribute to pests and disease prevalence besides climate change (Egonyu *et al.*, 2005; Night *et al.*, 2011).

In line with the discussions about the prevalence of pests and diseases demonstrating climate change, participants majorly focused on crop pests and rarely discussed diseases except in the context of poultry. This focus was informed by the women's argument that pests and diseases are interrelated with a few recognising them as different. These results highlight probable gender inequities in agricultural knowledge which relate to gender asymmetries in access to agricultural training explored in the previous Chapters. These observations propound women's reliance on traditional knowledge systems to determine adaptation decisions. The centrality of local knowledge in addressing environmental problems is emphasised in FPE's perspectives despite concerns about its sufficiency in tackling climate issues (Rocheleau *et al.*, 1996).

In relation to pests, new and highly destructive pests are observed. Participants connect the prevalence of pests and diseases and the emergence of new pests to the long drought of 1997 which was followed by another one in 2005. To elucidate this further, a key informant explains that before the 1997 drought, there was an armyworm called *Spodoptera exempta* which majorly infested maize, but it disappeared after the drought. Afterwards, a new type called fall armyworm (*Spodoptera frugiperda*) was noticed. The new fall armyworm is stated to prey on over 100 crop varieties that belong to the cereal and grass family such as maize, millet, sorghum, rice, heat, sugarcane, vegetables, and fruits. This differs from the armyworm which majorly preys on maize. Other pests such as mealybugs that were less common were found to be prevalent attacking any type of crop. The prevalence of pests and diseases implies adverse effects on agricultural production and also highlights the significance of women

implementing pest and disease control mechanisms. These changes are reported not to have occurred spontaneously but gradually and noticed over the years.

For the case of diseases, poultry disease especially coccidiosis is noted to have been on the rise. The majority of women reported to have lost birds, a critical component of their livelihoods. Similar to pests, the prevalence and severity of poultry disease is attributed to drought. With reference to the 1990s and earlier years, poultry disease was majorly experienced in the dry season but presently, birds are reported to get sick even during the rainy season. This is reported to have exacerbated women's burden of caring for and treating birds amidst financial constraints and competing welfare demands which they largely address (cf. section 5.2). Besides poultry, diseases that affect animals such as goats, sheep and cattle are explained by a few women (married and widows) whose households have these animals. But still, poultry disease is recognised as the most common. The fragility of poultry to diseases has been interrogated when discussing critical resources for adapting to climate change (cf. section 5.2). The main disease concerns raised are diarrhea and cough which women notice when tending animals. The connection between prevalence of pests and diseases and climate change and their consequent effects on agricultural outputs have been interrogated in previous studies (Biber-Freudenberger *et al.*, 2016; Mafongoya *et al.*, 2019; Niang *et al.*, 2017; Phophi, Mafongoya and Lottering, 2020). The effects of pests and diseases on agricultural outputs impose threats to the livelihoods of women farmers.

In summary, the experiences of smallholder women farmers with climate change entwines with the socio-cultural vulnerabilities of women to climate vagaries. Despite women farmers sharing common experiences with climate change especially in

relation to difficulties in fulfilling productive and reproductive gender roles, variations have been revealed. These variations are stated to have been constructed through the intersectional effects of gender, education of male household head, marital status, resources, geographical location and the topography of farmland. The experiences of women farmers with climate change unravels their intricate struggles to fulfil gender responsibilities. These struggles demonstrate the embeddedness of the detriments of climate change with the everyday lives of women and the threats that changes in the climate imposes on women's survival. Informed by FPE's arguments, climate change concerns can be described as survival issues (Rocheleau *et al.*, 1996). These survival issues relate to welfare such as food security, health and education. Based on this, women's climate adaptation decisions undertaken in the face of asymmetries in resource access and control, responsibilities and power, illustrate women's struggles to safeguard their livelihoods. The adaptation decisions of women farmers are interrogated in the following section (7.2)

7.2 Adaptation decisions: strategies, implementation methods and intensities

In the previous section (7.1), changes in the climate and the experiences of women farmers with these changes were explored revealing adverse women's experiences. In this section, adaptation decisions of women farmers are explored in relation to adaptation strategies, methods of implementing strategies and integrated use of multiple strategies. These discussions show how women navigate inequities in intra-household gender relations reinforced and reproduced through the interactions of gendered institutions (cf. section 6.2) in adaptation decision-making. These navigations are evidenced through women's consideration of their resources, responsibilities and power capabilities when deciding how to moderate climate risks. The on-farm and off-farm adaptation strategies adopted by women and contrasts and

similarities between the strategies employed by men household heads and women farmers are summarised in Table 8. Whilst exploring adaptation strategies, women do not clearly distinguish between ‘climate change adaptation’ from their ‘struggles for survival’ as evidenced in the ensuing discussions. Therefore, my analysis departs from studies that attempt to define adaptation to climate change in strict terms.

Table 8: Adaptation strategies adopted by women and male household heads

On-farm adaptation strategies	Farmer's sex	Women's constraints
Intercropping	Mostly females	Limited land access (small farmland), overcrowding crops
Contour farming	Females and male household heads	Shortage of labour and access to training
Crop rotation	Females and male household heads	Inadequate land access (small farmland)
Pesticides	Females and male household heads	Low incomes, limited access to training and implements (sprayers)
Altering planting dates	Females and male household heads	Limited access to climate information
Terracing	Females and male household heads	Labour shortage
Trenches	Male household heads	Labour shortage
Grass strips	Mostly male household heads with animals	Labour shortage, low income levels
Wetland/riverbank farming	Mostly male household heads	Limited access to wetlands/riverbanks
Ox-ploughing	Mostly male household heads	Small farmland, topography of farmland, low incomes
Fertilizers	Mostly male household heads	Financial limitations
Improved seeds	Mostly male household heads	Financial limitations
Irrigation	Mostly male household heads	Financial limitations, location of farmland
Off-farm adaptation strategies		
Poultry keeping	Mostly women	Limited access to training, low incomes to purchase vaccines
Food rationing	Mostly women	Food shortage

Petty businesses	Mostly women	Burden of gender roles, restrictions from male partners
Trade in livestock, produce, wholesale shops	Mostly male household heads	Burden of gender roles, low incomes, restrictions from male partners, cultural norms
Savings and lending groups	Mostly women	Low savings and credit portfolio, restrictions from male partners
Casual labour	Mostly women	Burden of gender responsibilities

Source: Field data (2022)

In Table 8, some on-farm and off-farm adaptation measures are predominantly employed by either male household heads or women farmers whilst others are shared. These variations and similarities are a reflection of the kind of adaptation decisions that women farmers undertake on the basis of their resources, responsibilities and power capacities as noted earlier. The next discussion explores adaptation strategies employed by women farmers so as to gain detailed accounts of how women farmers navigate inequities in intra-household gender relations in adaptation decision-making.

7.2.1 On-farm adaptation strategies

The on-farm adaptation strategies examined in this section are those prominently adopted by women farmers. These strategies are intercropping, crop rotation, contour farming, use of pesticides, altering planting dates, terracing and wetland or riverbank farming (cf. Table 8). The discussion in this section augments comprehensive understanding of the issues that women farmers negotiate when deciding to adopt on-farm adaptation strategies.

Intercropping

Women farmers predominantly adopt intercropping to alleviate the risks of climate change (cf. Table 8). Male household heads are reported to rarely practice intercropping because they commonly practice agriculture for commercial purposes. So cultivating one crop variety is described as more beneficial to male household heads than intercropping different crops. Key informants further explain that most male household heads have the capacity to employ other climate coping mechanisms such as fertilizers and improved seed varieties and so do not have to depend on intercropping like the women. Intercropping involves cultivating two or more crops in the same garden and at the same time (Glaze-Corcoran *et al.*, 2020; Himanen *et al.*, 2016). It is established that women farmers commonly intercrop short and long maturing crops with the aim of addressing food needs in households. Maize (corn) was largely intercropped with beans, potatoes with vegetables, groundnuts with millet, bananas with potatoes and cassava with groundnuts as illustrated in Figure 12.

Figure 12: Intercropping



Source: Transect walk (2022)

Even though some women intercrop up to three different crops, the majority intercrop two. Women majorly intercrop two crops to avoid crowding and its effects on crop yields. Women who intercrop more than two crops are mostly female household heads. This is reported to have been practiced by female household heads due to the small size of farming land and the need to diversify food production. The women who intercrop more than two crops are stated to experience more land access hinderances than those who predominantly intercrop two crops. This corroborates the intersectional effects of marital status and land size on how women practice intercropping. Considering that sparse distribution of crops enhance agricultural outputs by regulating plants competition for water, light and soil nutrients (Brooker *et al.*, 2015; Glaze-Corcoran *et al.*, 2020; Ouma and Jeruto, 2010), women who crowd more than two crops when intercropping can be noted to have realised low crop yields. In consonance with gender and climate adaptation scholarship, asymmetries in women's land access and size are asserted to frame women's preference for adaptation measures (Bikketi *et al.*, 2016; Doss *et al.*, 2018; Kristjanson *et al.*, 2017; Pérez *et al.*, 2014).

Other accounts of women's utilisation of intercropping relates to women's extensive experience with intercropping gained from childhood. Additionally, the abilities of women to practice intercropping with minimal financial, labour and approval encumbrances from male household heads enhance its utilisation. The usefulness of intercropping in spreading risks associated with erratic rainfall, heavy storms, dry spells and flooding and the capacities of women to practice it alongside other measures such as crop rotation and contour farming is also reported to inform its wide adoption. Results show that rarely do farmers experience complete crop failure as they

do when they cultivate one crop variety. A participant shared how intercropping leverages the risks of climate induced food scarcity in this extract.

Last year I intercropped cassava and groundnuts but because of unreliable rainfall, the groundnuts yielded very poorly while the cassava yield was fair. Much as I barely harvested groundnuts, at least I harvested some cassava which my family is feeding on up to now (Participant 1).

This extract illustrates the benefit of intercropping and the centrality of reproductive responsibilities such as food provision in the decisions that women make about what adaptation measures to implement. This corresponds with arguments in previous studies that recognise reproductive responsibilities as pivotal in women's climate decisions (Liru and Heineken, 2021; Niemann *et al.*, 2024; Van Aelst and Holvoet, 2016). Other studies have substantiated these observations by reiterating the relevance of intercropping legumes and cereals in improving agricultural outputs and food security (Maitra, 2019; Silberg, Richardson and Lopez, 2020). Congruent with FPE's arguments, results show the nexus between gender disparities in resource access and division of responsibilities and women's decisions to practice intercropping in response to climate change.

Contour farming

As represented in Table 8, contour farming is established as one of the strategies that women widely use to moderate the effects of change in the rainfall patterns and floods (cf. 7.1.1, 7.1.2). Its utilisation differs from intercropping in the sense that male household heads also adopt it although there are gender differences in their implementation as will be explored in the ensuing discussions in this section. Contour farming is described as significant in alleviating adverse climate effects such as soil erosion, surface runoff washing away crops and burying germinating crops in

compacted soil (cf. Figure 10). Contour farming is practiced by ploughing and planting crops across slopes with the aim of reducing inclination and creating roughness which reduces surface runoff and its resultant effects (Farahani, Fard and Asoodar, 2016; Morgan, 2009; Saggau, Kuhwald and Duttman, 2023). In my fieldwork area, women practice contour farming on both moderate and steep slopes whilst relying on their experiences gained from childhood. But it is disclosed that women who practice contour farming on steep slopes still experience devastating effects of soil erosion and crop losses illustrated in Figure 13.

Figure 13: Soil erosion and crops washed away by surface runoff



Source: Transect walk (2022)

The agricultural losses that women who practice contour farming on steep slopes experience is attributed to limited access to mild slope land and inadequate knowledge on how to effectively practice contour farming. This resonates with gender inequities in women's access to agricultural training, noted to have been reinforced through accommodation and competition interactions of gendered institutions (cf. section 6.2.1, 6.2.2). Limited access to agricultural training undermines women's acquisition of additional knowledge and skills to improve their mechanisms of coping with climate threats. As a result, women decide how to cope with climate change within the confines of their traditional knowledge which can compromise effective adaptation to climate

threats. FPE recognises local knowledge as critical in configuring environmental decisions such as those that concern climate adaptation (Rocheleau *et al.*, 1996). But without discrediting the significance of indigenous knowledge in climate adaptation decision-making, it can be observed that agricultural training are rather useful in enhancing the effectiveness of traditional knowledge and equipping women farmers with improved skills for adapting to climate change.

In the literature on sustainable agronomic practices, the effectiveness of contour farming in minimising detriments of climate change has been attributed to the steepness of the slope on which farming is being practiced. Mild and moderate slopes are noted as the most suitable areas for contour farming (Farahani, Fard and Asoodar, 2016; Saggau, Kuhwald and Duttman, 2023). Since women practiced contour farming even on steep slopes as noted earlier, it can be argued that practicing contour farming on inappropriate topographies exacerbate erosion induced crop losses. Interviews with key informants and women farmers disclosed that integrating grass strips and trenches shown is largely adopted by men as shown in Table 8. This is reported to improve the effectiveness of contour farming in moderating the adverse effects of catastrophic rainfall in steep sloped areas. The benefits of integrating grass strips and trenches shown in Figure 14 in contour farming has been reiterated by women farmers. But the majority of women demonstrated limited capacity to collaboratively use trenches and grass strips. Digging trenches is described as laborious in comparison to contours and other practices such as intercropping and crop rotation. With grass strips, it was explained that planting grass is mostly useful when the household has livestock to feed on the grass. These results underpin the influences of gender inequities in access to agricultural training and labour encumbrances on women's decisions to adopt contour farming. It further exemplifies

the linkages between gender disparities in access and control over land and hindrances to women's effective utilisation of contour farming to alleviate climate risks.

Figure 14: Strips of elephant grass and trenches



Source: Transect walk (2022)

Crop rotation

Female and male farmers widely employ crop rotation (cf. Table 8). However, variations in how women and men farmers rotate crops was revealed. Crop rotation is described as planting diverse crops on the same land every farming season (Arriaga, Guzman and Lowery, 2017; Yu *et al.*, 2022). Results in this study show that women rotate crops every season, however due to small land size and the burden of providing food to household members, the majority of women rotate the same crops every season and year. For instance, it is common for women (divorced, widows and married) to cultivate maize and beans in the first season of every year and on the same piece of land. Besides that, the same crops (maize and beans) that were cultivated in the first season are commonly intercropped with other crops in the second season and on the same piece of land. This differs from male household heads who decide to rotate diverse crop varieties across seasons and rarely practice

intercropping. It can be argued that whilst men practice diversified crop rotation, women practice simple rotation of crops.

The variance in the ways male household heads and women practice crop rotation is associated to male household heads majorly farming for commercial purposes and having access to bigger pieces of land than women (cf. section 5.1.1). Relatedly, FPE perspectives link the configurations of men's and women's resource access and control, and the power to make autonomous decisions to the performative effects of patriarchal values and masculine agendas that empower men and disempower women (Garcia *et al.*, 2022; Garcia and Tschakert, 2022; Resurreccion, 2017; Rocheleau *et al.*, 1996; Nyantakyi-Frimpong and Bezner-Kerr's, 2015). Since male household heads have the capacity to practice diversified crop rotation, it can be observed that men are able to harness the ecological benefits of crop rotation more than women farmers. Diversified crop rotation has been explained to improve crop yields in varying climate conditions through boosting soil nutrients, breaking the cycles of weeds, pests and diseases in comparison to moderate and simple crop rotation (Arriaga, Guzman and Lowery, 2017; Degani *et al.*, 2019; Nash *et al.*, 2018; Paustian *et al.*, 2016; Yu *et al.*, 2022).

The contrasts in the ways females and males practice crop rotation align with the effects of gendered institution interactions on women's adaptation decisions (cf. section 6.2). Through accommodation and competition interactions, inequities in women's access to land and disproportionate ascription of reproductive responsibilities influences women's adoption of simple crop rotation. As noted earlier, simple crop rotation is evidenced through women rotating the same crops on the same piece of land every farming season. These results underpin the impediments of the

interactions of gendered institutions on the ability of women to make decisions that permit them to effectively implement crop rotation in response to climate vagaries. In consonance, the detriments of the interactions of gendered institutions on women's adaptation decisions and their linkages to women's socio-cultural climate vulnerabilities have been noted in other studies (Bremer *et al.*, 2021; Lawson *et al.*, 2020 Mersha and Van Laerhoven, 2016).

The use of pesticides

The use of pesticides is widespread among both female and male farmers (cf. Table 8). This is associated with the prevalence of pests and diseases previously discussed in connection to women's climate change experiences (cf. section 7.1). Results reveal that about two decades ago, women farmers majorly used local measures to address the problem of pests and diseases. These measures include spraying crops with a concoction of ash and urine, timely weeding and cutting off crops that have been infested by pests and diseases. The significance of traditional pest control measures in modulating crop losses have been noted in the literature (Ajani, Mgbenka and Okeke, 2013; Srinivasan, Tamò and Subramanian, 2022; Subedi, Poudel and Aryal, 2023). However, due to the prevalence of pests and diseases and the severity of their effects on crop yields, the traditional measures are reported to have become less effective. In agreement, previous studies observe that the prevalence of pests and diseases, popularisation of pesticide use by governments and crop fragility to pests and diseases have lessened the uptake of traditional measures and compromised their effectiveness in alleviating the adverse effects of pests and diseases (Abate, Huis and Ampofo, 2000; Sharma *et al.*, 2010; Subedi, Poudel and Aryal, 2023). Concerns about the relevance of traditional pest control mechanisms have influenced arguments in favour of farmers integrating both traditional and modern measures in pest

management (Ajani, Mgbenka and Okeke, 2013; Subedi, Poudel and Aryal, 2023). These arguments are similar to FPE's perspectives on the significance of combining local and scientific knowledge when addressing environmental problems (Rocheleau *et al.*, 1996).

Despite females and males adopting pesticides, gender differences are noted in relation to access to the right pesticides, quantities and the mode of application. Participants explained that when crops are infested with pests and diseases, women go to agrovets with whatever amount of money in their possession. They describe the kind of pest that has infested their crops and request to be given pesticides worth what they can afford. To elucidate this further, a key informant explained that if a woman has Uganda shillings 1000 (\$0.27), she will ask the agrovet to apportion her a pesticide worth the amount that she has (Key informant Three). Women were also found to prominently spray crops against pests with handmade brooms due to lack of access to sprayer pumps. The relevance of sprayer pumps in pest and disease control and limitations to women's access was previously discussed in detail (cf. section 5.1.1).

Since women majorly purchased the pesticides that they could afford, it can be observed that barely did they utilise the right quantities or applied pesticides appropriately. Conversely, it was established that most male household heads accessed the right quantities of pesticides and prominently sprayed crops using sprayer pumps. This variance between male household head's and women's utilisation of pesticides was largely linked to gender disparities in income levels. The contrasts in men's and women's use of pesticides demonstrates the effects of the interactions of gendered institutions such as accommodation and competition on the

abilities of women to purchase the right quality and quantity of pesticides as well as hire or purchase sprayer pumps.

Much as some gendered institutions such as FTB's rules on women's access to agricultural loans focus on providing women with credit to purchase agricultural inputs such as pesticides, accommodation interaction is noted to undermine these efforts (cf. section 6.2.1). This has been manifested through male household heads using their power to restrict women's access to credit and participation in informal savings and lending groups. This can be argued to have shaped the decisions of women to use pesticides in ways that are considered improper as documented in previous studies (e.g. Gressel, 2011). The negating effects of inappropriate use of pesticides such as incorrect pesticide type, inadequate quantities and improper spraying of crops have been noted to contribute to pest resistance to pesticides (Gressel, 2011; Ntow *et al.*, 2006). This signifies that women precariously struggle with the adverse effects of pests and diseases despite their adaptation efforts.

Altering planting dates

Altering planting dates involves early or late planting and is practiced by both female and male farmers (cf. Table 8). The decisions to commence planting early or to delay are informed by variance in the rainfall patterns (cf. Table 7). These decisions are undertaken on the basis of weather forecasts provided by the district meteorological department or farmers' own forecasts established through their traditional knowledge. The indigenous knowledge that farmers rely upon is observed to have been gained through their experiences in agriculture and with the weather. Key informant interviews disclosed that meteorologists advise farmers to plant early or to delay planting depending on the onset, cessation, intensity and reliability of rainfall. However, due to

gender disparities in access to climate information perpetuated by accommodation interactions between gendered institutions such as IFDC rules, NAES guidelines and cultural norms on women's domestication (cf. section 6.2.1), the majority of women reported dependence on indigenous knowledge. For instance, even when IFDC and some agricultural extension programmes target providing climate information to all farmers including women, seldom do women access information. This differs from male household heads who are stated to rely on weather forecasts provided by the meteorological department and their traditional knowledge to decide when to commence planting. Due to the contribution of accommodation interactions to women's domestication and limited access to climate information, it can be argued that women's decisions to adjust planting dates in response to climate change is informed by their traditional knowledge. This foregrounds the centrality of traditional knowledge in the climate adaptation and decision-making in consonance with previous studies (Apraku, Morton and Apraku-Gyampoh, 2021; Zvobgo *et al.*, 2023). The FPE perspectives alongside other scholarship accentuates the role of traditional knowledge in framing adaptation decisions of farmers and enhancing eco-friendly climate adaptation (Klenk *et al.*, 2017; Radeny *et al.*, 2019; Rocheleau *et al.*, 1996; Xu and Grumbine, 2014).

Despite the relevance of local knowledge in adaptation decision-making of women farmers, challenges emanating from its utilisation are evidenced. For example, informed by the experiences of addressing the challenge of food scarcity, women practice early planting more than late planting even though the rainfall seems inadequate to support germination and crop growth. Early planting is reported as one of the measures that the majority of women grew up practicing and have continued to

implement in a bid to relieve food stress. It was established that in 2022, it started raining in February with light showers and majority of women proceeded to plant crops. In a short span, rain ceased and resumed towards the end of March. This resulted in crop failures and low crop yields exacerbating women's burden of addressing food needs in their households. This alludes to the dilemma that women encounter when solely relying on their indigenous knowledge with limited or no support from state or private agencies to harness the benefits of traditional knowledge in adaptation decision-making. This observation supports the arguments that emphasise the critical role of the state in facilitating farmers to effectively employ their indigenous knowledge to adapt to climate change (Klenk *et al.*, 2017; Naess, 2013; Xu and Grumbine, 2014). In this way, women are better equipped with knowledge to identify appropriate climate coping mechanisms and to effectively implement coping measures.

Terracing

Terracing is practiced by females and males farming in mountainous areas (cf. Table 8). This adaptation measure is employed to moderate risks associated with heavy downpours and surface runoff such as soil erosion. In terrace farming, steps or terraces are created across steep hills to regulate water flow during heavy rainfall and its negative effects on agricultural outputs (Chapagain and Raizada, 2017; Deng *et al.*, 2021; Marcin, 2011). Considering that steps are constructed across steep slopes as shown in Figure 15, farmers construct terraces using hand hoes and describe the process of creating terraces as labourious. It is a common practice for farmers to reinforce the end of terraces with grass strips and shrubs to enhance the effectiveness of the terrace in absorbing the pressure of surface runoff and moderating soil erosion.

Figure 15: Terraces



Source: Transect walk (2022)

Even though women and men participate in creating terraces, results show that women largely depend on their own labour with the help of children whilst male household heads utilise their own as well as hired labour. Once terraces have been constructed, women undertake the responsibility of maintaining them including those constructed by male household heads. This is in line with women's productive responsibilities discussed previously (cf. section 5.2). The maintenance of terraces aims at enhancing their effectiveness in regulating the adverse effects of climate change. The correlation between the effectiveness of terracing in alleviating detrimental effects of climate change and their maintenance has been noted in the literature. Poorly maintained terraces are stated to exacerbate rill or gully erosion (Deng *et al.*, 2021).

Despite the benefits of maintaining terraces, women are found to focus more on ensuring that terraces in gardens where male household heads farm majorly for commercial purposes are in good condition. These decisions can be observed to have been informed by disparities in gender division of responsibilities perpetrated by

accommodation and competition interactions of gendered institutions (cf. section 6.2.1). Accommodation and competition interactions reinforce gender-disproportionate division of responsibilities and power relations despite the Local Council Courts and the Land Amendment Act aiming at enhancing equitable intra-household gender relations by improving women's property rights. These aspects are noted to inform women's decisions to concentrate more on maintaining the terraces in men's gardens whilst overlooking those in their own gardens. These results illuminate FPE arguments on the roles of gender power inequities in constructing and reconstructing women's climate vulnerabilities and adaptation decisions (Ekowati *et al.*, 2023; Elmhirst, 2015; Garcia *et al.*, 2022; Gonda, 2019; Mugeni, 2023; Resurreccion, 2017). It can be asserted that despite women farmers in highland areas practicing terracing, they grapple with climate induced crop losses due to poorly maintained terraces and its consequent effects such as rill and gully erosions.

Ox-ploughing, wetland and riverbank farming

As represented in Table 8, ox-ploughing, wetland and riverbank farming are prominently employed by male household heads and a few women. It is reported that ox-ploughing boosts soil quality by digging deep to unearth soil nutrients replacing those that have been lost due to changes in the climate. In agreement with the observations on the connection between ox-ploughing and soil quality, previous studies assert that ploughing deep remedies soil organic carbon loss (Alcántara *et al.*, 2016; Lal, 2004). This improves the quality of topsoil and agricultural outputs. With respect to wetland and riverbank farming, women plant vegetables during the dry season primarily for subsistence. Farming in high precipitation and humid areas such as wetlands and riverbanks in response to climate change is observed in the literature (Asgharnezhad, Akbarlou and Sheidai-Karkaj, 2013; Githiora *et al.*, 2023; Islam, 2024;

Ruswinarsih *et al.*, 2024). Nonetheless, there are concerns about the deteriorating state of wetlands occasioned by human activities such as farming and its contribution to climate vagaries (Bekele and Haile, 2023; Erwin, 2009; Freeman *et al.*, 2022). This denotes that some adaptation measures adopted by women farmers can be classified as maladaptation.

In practicing ox-ploughing and wetland or riverbank farming, differences are revealed among the few women who employ these strategies. More widows than married women plough land using oxen and practice wetland or riverbank farming. The pronounced use of these strategies among widows although not in equal measure to the men is associated with household headship, improved access to land, credit and power to autonomously make certain decisions (cf. section 5.2). However, due to inequities in intra-household gender relations revealed in Chapter five, the use of the above strategies by women differs from that of the men. To elucidate further, some close relatives of deceased husbands claim land that widows cultivate in the wetland whilst married women are conditioned to weed their spouse's crops in order to cultivate vegetables in the wetland (cf. section 5.2). But complementary and substitution interactions of gendered institutions moderate these encumbrances and improve the abilities of women to adopt the above adaptation measures although to a small extent. These moderating effects are evidenced through the Land Amendment Act supporting some widows to retain their land access rights and some male household heads involving women partners in decisions that concern land utilisation (6.2.3). This resonates with some FPE arguments on the role of institutions in enhancing the abilities of women to adopt improved climate adaptation measures (Bhattarai, Beilin and Ford, 2015; Nightingale, 2006). It can be asserted that some interactions of

gendered institutions improve the capacities of women to employ different adaptation measures including those popularly adopted by men household heads.

7.2.2 Off-farm adaptation strategies

The off-farm adaptation strategies that women commonly employ are poultry keeping, membership in informal savings and credit groups, food rationing, casual work and small business as illustrated in Table 8. Among these measures, small businesses are the least used by women farmers. In a similar way as on-farm adaptation strategies, interrogating off-farm measures facilitates nuanced understanding of the issues that women farmers navigate when deciding how to adapt to climate change using off-farm strategies.

Poultry keeping

Most women reported to rear chicken to supplement their earnings from crop farming. When women experience poor harvest or crop failure, the birds are sold to generate income that enables them to fulfil their gender responsibilities explored previously (cf. section 5.3). Women also reported using chicken droppings as compost, but noted that, rarely did they realise significant improvement in agricultural outputs due to the small quantity of chicken droppings applied. On average, women were commonly reported to have between three to five chickens which in most cases reproduce and increase in number over time. The majority of women farmers decide to keep poultry because of its cultural ascription to women and the relative power that women have to access and utilise the birds during climate adversity (cf. section 5.2). In gender and climate adaptation literature, poultry keeping is described as a popular means of coping with climate risks among women farmers (Bikketi *et al.*, 2016; Khaitisa *et al.*, 2022; Nyahunda and Tirivangasi, 2022).

Despite the centrality of poultry keeping to women's climate response, the majority of women encounter barriers that undermine the gains from rearing birds. These barriers concern the prevalence of poultry disease, low income to vaccinate and treat birds when they become sick and lack of training. The prevalence of poultry disease and its connection to climate change has been explained in the previous section (cf. section 7.1.4). To illuminate on the risks of poultry disease, a key informant reported that whenever the birds get sick, the majority die due to lack of regular vaccination to boost their immunity, and late treatment. This implies that even though women rear birds, they still struggle with the adverse effects of climate change on their livelihoods. Furthermore, this also mirrors the socio-economic vulnerabilities of women and alludes to the significance of integrating different coping mechanisms to enhance effective climate adaptation. The difficulties that women face in adapting to climate change through poultry keeping correlates with gender disparities in resource access and control (cf. section 5.2).

Much as substitution interactions of gendered institutions facilitate women to access some funds from FTB and informal savings and lending groups to facilitate adaptation efforts such as treating birds (cf. section 6.2.4), the funds are rarely accessed or inadequate. Limited access to credit is linked to the competing gender responsibilities that women require finances to address, lack of collateral, low loan portfolio and restrictions from male household heads. These limitations are prominently related to gender power disparities and are culturally oriented as evidenced in accommodation and competition interactions of gendered institutions (cf. section 6.2.1, 6.2.2). Consequently, cultural norms can be underscored as critical in shaping and reshaping inequities in gender power relations thus impacting adaptation decisions of women

farmers. In FPE scholarship, this has been interpreted on the basis of the framings of gender power imbalances by de facto rules such as cultural norms and family structures (Elmhirst, 2015; Mollett and Faria, 2013; Rocheleau *et al.*, 1996; Sultana, 2021; Tschakert, 2012; Van Aelst and Holvoet, 2018). As noted in the aforementioned discussions, the decisions of women to practice poultry keeping and the drawbacks to its effective moderation of climate threats can be stated to have emanated from gender disparities in power relations. This observation does not ignore the nexus between gender inequities in women's access to credit and the hinderances that women experience in effectively adopting poultry keeping as climate coping mechanism.

Food rationing

Food rationing is employed by women farmers to deal with climate induced food shortages. This adaptation measure is described as primarily employed by women with no evidence of men implementing this climate coping approach (cf. Table 8). For the majority of women, the decision to ration food is informed by poor crop harvests and anticipated future food shortages. Participants stated that women commence reducing the quantity of food prepared for the family from the month of January whilst maintaining two meals a day. When it draws to February, women in some households withdraw one meal and maintain only one. By the end of February until the next harvest season which is noted to commence towards the end of April, the majority of women reduce the number of meals to one per day. Women farmers express dissatisfaction with this strategy because it means that household members have to starve at certain times of the day. Besides that, women sometimes have to forego or serve themselves smaller portions of food than the rest of the family members. This is aimed at ensuring that every member of the family at least eats some food. Even though women view food rationing negatively, they explain that this adaptation strategy facilitates them to

provide food for the children on a daily basis and over an extended period of time. Reduction in the number of meals that family members have in a day is described as a common climate adaptation strategy among women farmers (Saronga *et al.*, 2016; Sorgho *et al.*, 2020).

In recognition of the relevance of food rationing, women explained that ability to provide children food during scarcity even though its one meal per day brings about a sense of fulfilment. Women's prioritisation of feeding family members aligns with gender division of responsibilities explored previously (cf. section 5.3). Since women focus on ensuring family members access food whilst overlooking their own food needs sometimes, it can be argued that they physically absorb more effects of climate change on food availability than other household members. These results demonstrate a connection between women's decisions to adopt food rationing and accommodation interactions of gendered institutions. Through accommodation interactions, inequities in gender division of reproductive responsibilities are noted to have been sustained (cf. section 6.2.1). This is revealed through informal gendered institutions such as cultural institutions emphasising the significance of women preserving their marriages, demonstrating good morals by fulfilling their gender roles and ensuring food security. In response, women can be stated to have espoused food rationing so as to improve their ability to address food needs in households. In consonance with FPE's perspectives, disproportionate division of gender responsibilities is noted to incline women to make certain environmental decisions such as those that contribute to food security (Elmhirst, 2015; Resurrección *et al.*, 2019; Rocheleau *et al.*, 1996).

Membership in informal savings and lending groups

Membership in informal savings and lending groups is a prominent adaptation strategy among women farmers with a few men taking part (cf. Table 8). The involvement of the few men in women's informal savings and lending groups has been formerly explored revealing their culturally motivated participation in leadership (cf. section 5.1.2). The prominence of membership in savings and lending groups as an adaptation strategy aligns with their centrality in women's struggle for improved livelihoods. The results of this study corroborate with FPE's perspectives on women collectively working to address environmental issues that threaten their survival (Rocheleau *et al.*, 1996). This does not essentialise women's collective struggles because some of the struggles that women deal with are individual, informed by variations in their socio-economic circumstances. In the different groups that women belong to, members save and borrow money to fund different agricultural activities and repay with 10% interest (cf. section 6.1.2). Membership in informal savings and lending groups has been described as crucial to women's climate response because groups enhance access to financial resources (Assan *et al.*, 2018; Lawson *et al.*, 2020; Oware, 2020).

As disclosed earlier, gender disparity in women's access to finances to fund adaptation decisions persists despite agencies such as FTB designating agricultural loans for women (cf. section 6.1.1). These disparities are observed to have been sustained through competition interactions of gendered institutions. Through competition interactions, cultural norms that ascribed male household heads control over valuable resources such as land and the power to regulate women's actions compromised women's access to formal credit. Consequently, the majority of women opted for informal savings and lending groups as remedy to their financial difficulties in a bid to moderate the effects of climate change. Much as women decided to gain membership

in informal savings and lending groups, the significance of this adaptation measure was found to have been undermined by low credit portfolio and gender asymmetries in women's responsibilities and power (cf. section 5.2, 5.3). This is consistent with the limitations of informal associations in improving women's adaptation capacities recognised in the literature. These challenges include inadequate timely access to credit, burden of reproductive responsibilities and lack of power to determine priorities (Fletschner and Kenney, 2014; Marshall *et al.*, 2023; Pienaaah, Seidu and Issahaku, 2022). Limitations in women's access to formal credit and low income levels account for women's adoption of informal savings and lending groups as climate response mechanisms.

Petty business

In contrast to poultry keeping and food rationing, petty businesses are practiced by a few women farmers (cf. Table 8). Among the few who engage in petty businesses, married women are more than widows. Women's involvement in petty trade is informed by the need to generate income and to enhance their capacities to address welfare needs such as food in the face of climate change. Further evidence reveals that despite petty trade being uncommon among male household heads, men also involve in business as a way of cushioning themselves against the detriments of climate change. However, the businesses of male household heads differ from that of the women on the basis of the economic value of the items that they trade in. Whilst male household heads trade in livestock, produce and wholesale shops, women sell pancakes, cook sweet potatoes, vegetables and fruits. Based on this variance, male household heads earn more from business than women and so are more climate resilient than women farmers. This substantiates observations about gender disparities in farmers climate vulnerabilities with women described as more

susceptible to climate risks than the men (Assefa and Gebrehiwot, 2023; Wrigley-Asante *et al.*, 2019). But this does not confer homogeneities in the climate vulnerabilities of women farmers as previously revealed in Chapters Five and Six.

The variance in married and widowed women's adoption of petty businesses is reported to have been informed by the heavy burden that married women bear with regards to addressing the welfare needs of children. In terms of the overall low adoption of petty businesses, women associated it to the burden of reproductive responsibilities, restrictions from male household heads and culturally oriented negative attitudes towards women who engage in business. Since involving in business means spending some time in the public, this adaptation measure departs from the acceptable moral standards of a 'good woman' keeping within her homestead (cf. section 6.1.2). The tradition of women's and girl's confinement to the domestic spheres depicting good morals in some African contexts have been observed in previous studies (Alordiah *et al.*, 2022; Bassey and Bubu, 2019). But analysis shows that even though cultural norms inhibit women's involvement in business, women rarely support such norms. Some women reported that they contest norms that constrained their involvement in business thus accounting for some women's decisions to engage in business. Even though such decisions are undertaken, married women still have to negotiate their decisions to engage in businesses with male household heads. Authorisation is commonly granted on the condition that women offer them (male household heads) financial support in return.

The decisions of a few women to adopt petty businesses allude to the adverse effects of accommodation interactions on the adaptation decisions of women. By portraying women who engage in business negatively, the decisions of women to involve in

different businesses in response to climate change are jeopardised. This corresponds with the argument that accommodation interactions contradict the 'spirit' resulting in undesirable outcomes (Helmke and Levistky, 2004). In the case of adopting businesses, women are discouraged by the negative labels on those involved in business alongside other limiting factors such as seeking the approval of male household heads. This underpins the effects of culturally defined moral standards on the decisions of women to employ small businesses alongside other adaptation measures that are regarded to contradict traditionally established moral standards of women.

Casual labour

Some women work in farms of progressive farmers (cf. section 5.1.2) as casual labourers to earn income which enables them to meet the welfare needs of their household members. It was explained that casual labourers are paid Uganda shillings 3000 - 6000 (\$ 0.81- 1.61) for weeding for about four hours (7:00 to 11:00). The amount casual workers are paid is contingent to the demand for labour and the kind of crops being weeded. For instance, those who weed rice or millet earn slightly more than those weeding maize, potatoes or onions. This is because weeding rice is perceived to be more time consuming due to the spacing of rice than weeding maize or any other crops that are widely spaced. As shown in Table 7, a few male household heads also undertake casual work in the gardens of progressive farmers. But unlike women who are noted to spend their earnings on addressing family welfare needs, male household heads are stated to spend their earnings on individual needs. Women's utilisation of their earnings to address welfare needs illustrate the linkage between their decisions to engage in casual work and gender disparities in division of responsibilities.

This reiterates inequities in gender division of responsibilities revealed in the former discussions (cf. section 5.3). The women who majorly engage in casual work are those whose households have small land for farming. Those with large farms rarely engage in casual work due to the burden of agricultural activities. In compliance with the traditional roles, women weed all crops cultivated in the household including those farmed by male household heads for commercial purposes (cf. Table 4). Even though doing paid work in other people's gardens is acknowledged as an off-farm adaptation method, some scholars note that it poses negative implications on women because it is labour intensive and decreases household labour (Gianessi, 2009; Hasalkar *et al.*, 2017; Nyberg *et al.*, 2020). This signifies that women who utilise this adaptation measure spend most of their time doing garden work with limited rest. As a result, their abilities to engage in other adaptation strategies such as small businesses or actively engaging in informal savings and lending groups that would enhance their adaptation capacity is curtailed.

Analysis in this section also demonstrates the relationship between women's decisions to undertake casual work and competition interactions of gendered institutions. The violation of formal rules that aim at enhancing equity in intra-household gender relations such as the Land Amendment and Succession Acts reinforce the powerful position of male household heads. This complicates women's abilities to confront gender injustices such as those that burden women with reproductive responsibilities and restricts their involvement in livelihood activities that are undertaken in the public. Consequently, women engage in casual work because it earns them some money to address welfare needs and keeps them within the domestic spheres. In a similar way

to small businesses, women's adoption of casual work can be asserted to have been informed by its alignment with women's culturally defined moral standards.

In summary, the results above account for the adaptation decisions of smallholder women farmers. The configurations of the decisions that women undertake concerning how to adapt to climate change correspond with gender asymmetries in intra-household gender relations reinforced through the interactions of gendered institutions. Smallholder women farmers are inclined to adopt on-farm and off-farm adaptation measures that are congruent with their resources, responsibilities and power. Women farmers implement measures that they have capacity to implement whilst relying on resources accessible to them and those that enhance their abilities to address their gender responsibilities. In relation to power, women majorly implement adaptation measures that they have the power to implement without seeking authorisation from male household heads. It is based on these considerations that women predominantly employ traditional on-farm adaptation strategies such as intercropping, crop rotation, contour farming, terracing, altering planting dates and a few modern on-farm adaptation measures such as the use of pesticides. In terms of off-farm adaptation strategies, women farmers prominently adopt poultry keeping, membership in informal savings and lending groups, casual work and food rationing. A few measures that require authorisation from male household heads such as wetland or riverbank farming and small businesses are also used by a few women. Other strategies such as ox-ploughing, grass strips and trenches are also adopted by a few women depending on household headship, household resources like livestock and concord relationships with male household heads. For the strategies that require authorisation, male household heads grant approval contingent to the benefits they gain from women employing those adaptation strategies.

The ways through which women implement adaptation measures and the extent of adaptation intensification is also shaped by inequities in intra-household gender relations. Women purchase pesticides commensurate to their incomes, use handmade brooms to spray crops against pests, crowd crops when intercropping and rely on local knowledge to alter planting dates. In terms of adaptation intensity, women mostly integrate traditional on-farm adaptation measures and some off-farm adaptation measures disclosed above. For instance, intercropping is commonly practiced alongside crop rotation, contour farming or terracing. Based on evidence in this study, it can be asserted that women's pronounced adoption of traditional adaptation measures does not denote inadequate and ineffective adaptation to climate change. Traditional adaptation strategies may present sustainable ecological benefits which can further be harnessed by integrating ecologically compatible modern adaptation strategies.

7.3 Conclusion

The experiences of smallholder women farmers with climate change underpins its devastating effects on women's survival and the complexities that women navigate when adapting to climate change. These complexities concern adaptation capacities of women farmers that are constructed and reconstructed through the intersectional outcomes of gendered institutions on intra-household gender relations and other social variables such as marital status and household headship. As a result, the climate experiences of women farmers are characterised by both commonalities and heterogeneities. However, commonalities are the most pronounced. These common experiences relate to difficulties that women face in fulfilling productive and

reproductive roles such as providing food, tending livestock and fetching water. To safeguard survival, women undertake decisions to adapt to climate change.

The adaptation decisions of women farmers are configured by asymmetries in intra-household gender relations reproduced through the interactions of gendered institutions. Gender asymmetries in women's resource access and control, division of responsibilities and power circumscribes adaptation decisions of women farmers majorly to traditional strategies, methods of implementation and adaptation intensities. Women farmers implement these strategies whilst relying on the local knowledge gained through their experiences in agriculture and with the climate. The on-farm adaptation strategies that women prominently implement are traditional whilst the off-farm measures are consistent with cultural moral standards that domesticate women and grants them control over low economic value resources such as poultry. This confinement of adaptation decisions to traditional strategies impede integration of modern on-farm strategies. Even where women decide to adopt certain modern adaptation measures such as the use of pesticides, hinderances reinforced by the interactions of gendered institutions undermine the effectiveness of these strategies in modulating the detriments of climate change. These impediments inhibit the abilities of women farmers to adopt diverse climate coping mechanisms and to utilise modern knowledge to leverage the benefits of their responses to climate change.

Drawing attention to the relevance of women adopting diverse adaptation measures does not discount the effectiveness of traditional adaptation strategies and local knowledge in moderating climate threats. The benefits of traditional adaptation measures and local knowledge in climate response has been demonstrated in this Chapter in consonance with some gender and climate change adaptation literature

including FPE scholarship. FPE perspectives underscore the nexus between local knowledge gained through everyday lived experiences and struggle for survival which women pursue through making diverse environmental decisions (Allen, 2011; Elmhirst, 2011; Rocheleau *et al.*, 1996; Sultana, 2021). The benefits of traditional adaptation measures and knowledge in climate adaptation pertain to ecological friendliness, cost effectiveness, relevance to people's everyday lives and accessibility to farmers. But still, critical aspects such as implementing appropriate traditional strategies, implementing these strategies effectively, integrating scientific knowledge and other adaptation strategies are crucial in harnessing the benefits of employing traditional adaptation strategies just as modern adaptation measures. Gaps in any of the above aspects render traditional adaptation measures and knowledge less effective in alleviating the adverse effects of climate change as evidenced in this Chapter. This Chapter ushers in Chapter eight which concentrates on the thesis conclusions.

CHAPTER EIGHT: CONCLUSION

8.0 Introduction

This thesis explores intra-household gender relations, the interactions of gendered institutions and adaptation decisions of smallholder women farmers. Whilst deducing from these explorations and with the aid of my conceptual framework (cf. section 3.4.4), this chapter highlights the major findings and discusses them briefly while drawing conclusions. This study set out to understand how the interconnections between intra-household gender relations and the interactions of gendered institutions influence adaptation decisions of smallholder women farmers in Uganda. The investigations were undertaken by interrogating three questions: i) what intra-household gender relations do smallholder women farmers navigate in adaptation decision-making? ii) How do gendered institutions interact with each other and with intra-household gender relations? iii) what are the experiences of smallholder women farmers with climate change and how do women decide to adapt to climate change? To address the aforementioned questions, I adopted qualitative methodology (cf. Chapter four) to generate empirical evidence. The household is my unit of analysis conceptualised as the space where gender relations, the interactions of gendered institutions and adaptation decisions of women interplay in their entirety. This enhances nuanced and context-specific grasp of the configurations and reconfigurations of the adaptation decisions of smallholder women farmers.

This Chapter is structured in five sections. Section 8.1 centres on answering my research questions and drawing conclusions whilst highlighting major study results. I further demonstrate the outcomes of the interplay between intra-household gender relations and the interactions of gendered institutions on the adaptation decisions of smallholder women farmers. Section 8.2 focuses on the contribution my research

makes to knowledge. It discloses how my study converges with and departs from literature on gender and adaptation to climate change and my theoretical underpinnings (FPE and SRA). In section 8.3, areas for future research reflecting aspects that my study rarely discusses in-depth are explored. Section 8.4 concentrates on policy recommendations drawn from my study conclusions. The last section 8.5 covers the Chapter conclusion which collates key discussions in the chapter in relation to my main research question.

8.1 Answering research questions and conclusions

This section synthesises results drawn from my empirical Chapters to demonstrate how the research questions have been addressed. The discussions herein integrate FPE and SRA theoretical perspectives and the conceptual framework of my study (cf. Chapter three). The major results are discussed in correspondence with how the research questions are answered.

8.1.1 What intra-household gender relations do smallholder women farmers navigate in adaptation decision-making?

Intra-household gender relations are largely characterised by asymmetries constructed and reconstructed majorly by cultural norms. In correspondence with the conceptualisation of gender relations represented in my conceptual framework (cf. section 3.4.4), cultural norms are observed to restrict women's resource access and control, ascribe women more productive and reproductive responsibilities and demarcate power to the men. In FPE scholarship, such gender asymmetries that women experience in households and other workspaces are associated with the intersection between gender and culture (Elmhirst, 2015; Gonda, 2019; Rocheleau *et al.*, 1996; Sundberg, 2017). Other gender and climate adaptation studies discussed in

my literature review Chapter also amplify the relationship between cultural norms and inequities in gender relations (cf. section 3.2.1). This underpins the pivotal role of cultural norms such as those that deny women land inheritance, the power to make autonomous decisions, domesticate women and persistently skew gender relations in ways that undermine the abilities of women farmers to make adaptation decisions. As evidenced in my study, even in some cases where the intersecting effects of household headship, marital status, family resources, children and agency, described as 'other mediating factors' in my conceptual framework (cf. section 3.4.4), moderate these asymmetries, they still persist. Asymmetrical intra-household gender relations signify that women farmers struggle with limited access and control over resources, burden of productive and reproductive responsibilities and power imbalances. Based on this, I assert that intra-household gender relations are largely asymmetrical and impose constraining implications on adaptation decision-making capacities of women farmers.

The intersection between the social characteristics of women contributes some symmetries in intra-household gender relations and positive effects on adaptation decision-making capacities of women farmers but to a small extent. Symmetries are evidenced through some female household heads (widows) retaining the rights to access family land after the demise of a spouse and the power to determine what crops to cultivate, when and where to cultivate (cf. section 5.2). However, these rights are rarely granted voluntarily as is the case for the men whose resource rights are safeguarded by cultural norms. For instance, some female household heads resist the directives of close relatives of deceased spouses to vacate family land and others seek the intervention of state and non-state actors in cases where the clan leaders fail to resolve their land related grievances and to secure their land access rights (cf.

section 5.2). This exemplifies the difficulties that women face in pursuing gender equity in resource access in spaces that are deeply entrenched by cultural norms. Since few women have better access to resources such as land in comparison to the majority although not in equal measure to male household heads, it can be stated that asymmetries persist in intra-household gender relations thus narrowing women's adaptation decision-making opportunities. The intervention of state and non-state actors delineates a positive connection between formal gendered institutions and intra-household gender relations that are explored in the subsequent section (cf. section 8.1.2). In FPE and other gender related studies, the intersectionality of diverse social variables and their construction of gender relations and other subjectivities are observed (Arora-Jonsson, 2011; Carr and Thompson, 2014; Hackfort and Burchardt, 2018; Rocheleau *et al.*, 1996; Sugden *et al.*, 2014; Thompson, 2021). In the case of my research, the intersection of women's social characteristics such as marital status, household headship and resources positively correlates with intra-household gender relations and adaptation decision-making abilities of women. The evidence above accentuates other variables that construct and reconstruct symmetrical and asymmetrical intra-household gender relations and women's adaptation decisions aside from cultural norms. But due to the circumscription of cultural norms, the above positive renderings are jeopardised. Therefore, I note that due to the entrenchment of intra-household gender relations with cultural norms, the realisation of gender symmetries and positive impacts on women's adaptation decisions — even in spaces where social characteristics advantage women — is complex, gradual and less pronounced.

Most women farmers creatively practice agency to navigate asymmetrical intra-household gender relations and negotiate adaptation decisions. Women's adoption of

creative mechanisms of negotiating gender disparities in households is informed by intra-household conflicts and their negative effects on women's relationships with male household heads and decision-making prospects (cf. section 5.3). Since intra-household gender relations are ingrained with cultural norms, contesting gender injustices is problematic for women (Ademiluka, 2018; Kabeer, 2000; Kwarazuka, Locke and Seeley, 2019; Mwine, 2019). In my study, women's creative navigation of intra-household inequities is evidenced through women seeking the intervention of clan leaders, complying with rules set by male household heads and fulfilling gender responsibilities diligently (cf. section 5.3). In other gender relations studies, similar measures such as negotiation, compromise, silence and compliance with gender norms are observed as ways through which women navigate gender inequities (Arrey-Ngang, 2020; Gatwiri and Mumbi, 2020; Kwarazuka, Locke and Seeley, 2019; Nnaemeka, 2004). However, the above strategies do not discount the relevance of other measures such as social movements and demonstrations that some women employ to challenge gender related injustices as noted in some FPE literature (e.g. Graddy-Lovelace, 2017; Lamb *et al.*, 2018; Rocheleau's *et al.*, 1996). But as discussed earlier, practicing agency through resistance can be difficult for women in some African societies due to the strong influences of cultural norms. Therefore, women farmers utilise other measures such as seeking the intervention of clan leaders and fulfilling their gender roles to enhance their capacities to negotiate their actions and solicit short- and long-term gains from male partners even amidst gender inequities. Based on the evidence discussed, I note that creative agency elicits more equitable intra-household gender relations and positive implications for women's climate adaptation decision-making.

In summary, smallholder women farmers predominantly navigate asymmetries in

resource access and control, responsibilities and power in adaptation decision-making. These asymmetries are interwoven with cultural norms that reconstruct disparities in intra-household gender relations. Resultantly, asymmetries are compounded, imposing negative implications on the capacities of women to make adaptation decisions. The strong connection between cultural norms, women's solicitation of help from state and non-state authorities and intra-household gender relations demonstrated above denotes interaction between formal and informal gendered institutions. These interactions presage the interconnections between the gendered institutions and intra-household gender relations and their linkage to adaptation decisions of women farmers as represented in my conceptual framework (cf. section 3.4.4). I examine the interconnections between intra-household gender relations and the interactions between gendered institutions in the next section.

8.1.2 How do gendered institutions interact with each other and with intra-household gender relations?

Gendered institutions, conceptualised in my study as formal and informal rules that are explicitly concerned with gender, interact with each other. These interactions are evidenced through formal and informal gendered institutions interacting with the aim of achieving shared or differing objectives (cf. section 3.3). The formal and informal gendered institutions that interact with each other are those that consciously focus on men's and women's access to resources critical for adapting to climate change, division of responsibilities, power relations and resolution of domestic disputes. These formal gendered institutions are the Land (Amendment) Act 2010, Succession Act 2000, Local Council Courts Act 2006, NAES guidelines, rules of IFDC and FTB (cf. section 6.1.1). On the other hand, the informal gendered institutions are cultural norms, patriarchal family rules that are upheld and often enforced by male household

heads and the rules of informal savings and lending groups (cf. section 6.1.2). Gender and institution related studies recognise the interactions between formal and informal institutions and their diverse effects on females and males (Bremer *et al.*, 2021; Kabeer and Subrahmanian, 1996; Lawson *et al.*, 2020; Mersha and Van Laerhoven, 2016). The interactions of gendered institutions are postulated to interconnect with intra-household gender relations as represented in my conceptual framework (cf. section 3.4.4). This has been demonstrated through interactions of gendered institutions reinforcing and reproducing asymmetrical intra-household gender relations that negate adaptation decision-making abilities of women farmers (cf. section 6.2).

The reinforcement of asymmetrical intra-household gender relations largely associates with accommodation and competition interactions of formal and informal gendered institutions. Accommodation and competition interactions of institutions have been previously discussed in detail (cf. section 3.3.3). The foretated interactions are exemplified through informal gendered institutional actors such as clan leaders discouraging women from seeking the intervention of formal gendered institutions to resolve concerns that arise from competition interactions. These gender concerns largely relate to informal gendered institutions, particularly cultural norms, restricting women's access and control over land and over other family resources like agricultural produce and the power to determine how to utilise family resources (cf. section 6.2.2). In correspondence with the argument that through accommodation interactions informal gendered institutions contradict the 'spirit but not the letter' of formal gendered institutions, women are encouraged to seek help from informal arrangements (Helmke and Levitsky, 2004, p. 729). To preserve family cohesion and the sanctity of marriage, informal institutional actors advise women to handle domestic issues as private matters (cf. section 6.2.1). On this account, most women are inclined to seek the

intervention of informal gendered institutional actors such as close relatives and clan leaders even though their concerns are rarely resolved satisfactorily. The alienation of domestic issues from the wider society is noted in previous gender relations studies as a common practice in Africa, aimed at protecting male household heads from public disgrace (Bawa, 2012; Bouilly, Rillon and Cross, 2016; Tamale, 2004). Protecting male household heads in such ways perpetuate gender disparities in households. Interpreting domestic issues as private affairs signify that women should resolve family disputes discreetly without involving formal gendered institutional actors. This undermines agency which contributes to women's resolve to seek justice from formal gendered institutions even in cases where informal gendered institutions such as cultural norms inhibit their actions. Women's lack of agency sustains asymmetrical intra-household gender relations and exacerbate constraints to their adaptation decisions. The above evidence signifies that formal gendered institutions are widely ignored by informal gendered institutions. This gives prominence to informal gendered institutions that reinforce asymmetrical intra-household gender relations and impede the abilities of women to decide how to effectively adapt to climate change.

Moreover, through competition and accommodation interactions, the benefits of complementary and substitution interactions of gendered institutions are constrained. In this way, asymmetrical intra-household gender relations and their impeding effects on women's adaptation decisions are further reinforced. For instance, complementary and substitution interactions produce some symmetries between females and males in resource access and decision-making. Due to cooperation and coordination between formal and informal institutional actors when addressing gender concerns, some male household heads are inclined to involve female spouses in family decision-making. Additionally, some authorise women's access to quality land and employ non-

confrontational strategies to negotiate their interests such as being friendly, returning home early from the trading centre and paying children's school fees in time as opposed to forcefully asserting their demands and interests (cf. section 6.2). In previous environment and institution studies, the positive outcomes of institution interactions in addressing environmental problems are illustrated by stressing the benefits of cooperation (Fischer *et al.*, 2021; Oberthür and Gehring, 2006; Yeboah-Assiamah, Muller and Domfeh, 2019). This signifies that there is a potential for interactions between formal and informal gendered institutions positively interlinking with intra-household gender relations.

However, even though a few women realised some equities in access to land and credit, some gender disparities with respect to the power to make big land related decisions such as leasing land persists. This reflects reinforcement of asymmetrical intra-household gender relations evidenced through informal gendered institutions contradicting the provisions of formal gendered institutions about women's equitable resource access and control (Doss *et al.*, 2018; Kristjanson *et al.*, 2017). Resultantly, the majority of women grapple with resource related inequities that sabotage their capabilities to make adaptation decisions. Since capabilities interpreted as freedoms to make decisions are constrained, women's vulnerabilities to climate risks are exacerbated (Hobson, 2018; HRD, 2019). This denotes women's continued struggles with resources, responsibilities and power asymmetries even in situations where formal gendered institutions that target alleviating gender inequalities function. It further exemplifies that without adequate support from informal gendered institutions, formal gendered institutions may struggle to improve the abilities of women to make adaptation decisions.

The reproduction of asymmetries in intra-household gender relations and barriers to women's adaptation decisions are exhibited in the practices of some gendered institutions and those of institutional actors. Some formal gendered institutions require women to provide approval from male household heads in order to get loans whilst some agricultural extension programmes target progressive farmers who are predominantly men (cf. section 6.1). These practices replicate impediments to women's access to credit and knowledge and skills for adapting to climate change. As evidenced in my study, rarely do male household heads approve women's autonomous decisions to seek formal credit and hardly are progressive farmers women. This illustrates that some gendered institutions are less sensitive to the needs and concerns of women. This aligns with SRA perspectives and that of other scholars who assert that institutions are not gender neutral and can duplicate gender disparities (Kabeer, 1994; Makina and Moyo, 2016; Taylor, 2004). In relation to characteristics of institutional actors, some addressed women's concerns with culturally oriented biases, dishonesty and selfish motives such as bribery (cf. section 6.2). These behaviours manifest gender inequities in that they portray women as weak and culturally inferior to men thus duplicating gender asymmetries. Institution related studies observe institutional weaknesses such as corruption, lack of transparency and accountability as hinderances to the positive outcomes of institution interactions (High *et al.*, 2006; Nunan *et al.*, 2018; Valdivieso, Andersson and Villena-Roldán, 2017; Whaley, 2022). The reproduction of disparities in intra-household gender relations sustain male household head's powerful and women's inferior social positions thus constructing recurring hinderances to the capacities of women to make adaptation decisions. In line with SRA perspectives on analysing institution interactions on the basis of how they enable or constrain realisation of desired outcomes and frame how people benefit or

lose (Kabeer, 1994), asymmetrical intra-household gender relations have been mostly reinforced and reproduced. Additionally, male household heads greatly benefit from the interactions of gendered institutions through better access to resources such as agricultural trainings in comparison to women farmers.

Whilst inferring from the above discussions, I note that the interactions between formal and informal gendered institutions mostly reinforce and reproduce asymmetries in intra-household gender relations. This imposes persistent constraints to women's adaptation decision-making. Asymmetries are shaped by accommodation and competition interactions where informal gendered institutions subtly ignore formal gendered institutions due to power differences. The reproduction of asymmetries occurs through gender insensitive formal institutions and the weaknesses of institutional actors. This contradicts the normative expectations of formal gendered institutions to promote gender inequities and underpin the intricate interrelationship between informal gendered institutions and intra-household gender relations. This configuration of intra-household gender relations exemplify the entrenchment of the spaces within which women make adaptation decisions such as households by gendered institutions and their interactions. Such entrenchment mostly inhibits the abilities of women farmers to effectively decide how to adapt to climate change. In my conceptual framework, this relationship is postulated as the linkage between the interactions of formal and informal gendered institutions and the climate adaptation decisions that women farmers make (cf. section 3.4.4).

8.1.3 What are the experiences of smallholder women farmers with climate change and how do they decide to adapt to these changes?

The changes in the climate are gradual and persistent, earmarked with variability in rainfall patterns. The consequences of rainfall variability such as floods, dry spells and pests and diseases widely construct common experiences among women farmers with a few contrasts. These contrasts are configured through the intersecting effects of the social characteristics of women farmers such as marital status, household headship and topographies of farmland. Despite these contrasts, the majority of women experience adverse effects of climate change shaped by disproportionate division of gender responsibilities alongside other resources and power disparities. For instance, the burden of gender roles such as food provision, tending livestock and fetching water for domestic use exacerbate the devastating experiences that women have with climate change in comparison to male household heads (cf. section 7.1). This demonstrates a connection between disparities in gender division of responsibilities and the severe effects of climate change on women as asserted in previous studies (Denton, 2002; Ngigi, Mueller and Birner, 2017). Informed by the adverse experiences of women with climate change, adopting adaptation strategies is inevitable in a bid to safeguard survival.

Adaptation decisions of smallholder women farmers are strongly configured by asymmetrical intra-household gender relations and are restricted to traditional adaptation strategies and knowledge. Asymmetrical intra-household gender relations are characterised by impediments to women's resource access and control, disproportionate division of responsibilities and power imbalances, reinforced and reproduced through the interactions of gendered institutions (cf. section 6.2). In previous studies, traditional adaptation measures are observed as useful in resource

scarcity (Leal Filho *et al.*, 2022; Zvobgo *et al.*, 2022). However, their usefulness in climate response transcends resource scarcity and encompasses ecological benefits, as explored in the ongoing discussions. In my study, women farmers implement traditional on-farm adaptation measures such as crop rotation, intercropping, contour farming and terracing because of their affordability on the basis of finance, labour, knowledge and ability to implement measures without seeking authorisation from male household heads (cf. section 7.2). Other strategies such as intercropping are mostly adopted because of their usefulness in enhancing food security whilst off-farm measures such as poultry keeping and casual work are utilised due to their correspondence with cultural norms that domesticate women (cf. section 7.2). The decisions of women farmers to implement traditional adaptation strategies and use local adaptation knowledge can be observed as a way of navigating asymmetrical intra-household gender relations in line with agency to adapt to climate risks and safeguard livelihoods as discussed previously (cf. section 8.1.1). The effects of women's socio-cultural impediments on adaptation decision-making and its linkage to women's climate vulnerabilities is documented in previous studies (Pearse, 2017; Raihan, Fatehin and Haque, 2009).

Even though women have been able to adapt to climate change using traditional measures and knowledge, their abilities to effectively employ adaptation measures and intensify adaptation by appropriately integrating modern or traditional strategies is undermined. This effect has been hypothesised in my conceptual framework to compromise women's adaptation to climate change (cf. section 3.4.4). From the evidence in my study, I assert that adaptation decisions of women farmers are constrained by asymmetrical intra-household gender relations that restrict women's adaptation decisions to traditional strategies and knowledge.

The traditional climate adaptation strategies and knowledge that women farmers employ inadequately moderate the risks of climate change. These inadequacies are majorly linked to ineffective implementation methods and adaptation intensification and not the type of traditional methods. For instance, some women farmers crowd crops when practicing intercropping, rarely maintain their terraces, rotate the same crops on the same piece of land and practice contour farming on steep slopes without reinforcing contours with trenches and grass strips (cf. section 7.2.1). With respect to off-farm adaptation, most women lose poultry to disease due to untimely treatment and irregular vaccination (cf. section 7.2.2). In previous discussions, these practices are established to compromise effective climate adaptation using the above stated traditional strategies (cf. section 7.2). Based on these results, it can be argued that traditional adaptation strategies and knowledge are useful in climate adaptation. In FPE scholarship, similar perspectives are advanced in line with relevance of local knowledge in environmental decisions. This is explained in relation to the nexus between indigenous knowledge gained through women's everyday lived experiences, struggle for survival and environmental decisions (Allen, 2011; Elmhirst, 2011; Rocheleau *et al.*, 1996; Sultana, 2021). In other studies, the significance of traditional adaptation strategies and measures is asserted in relation to their ecological benefits, cost effectiveness and accessibility (Akinagbe and Irohibe, 2015; Apraku, Morton and Apraku-Gyampoh, 2021; Spear *et al.*, 2019; Stigter *et al.*, 2005; Ozor, Urama and Mwangi, 2012; Zvobgo *et al.*, 2022). But there are some critics of the effectiveness of traditional methods and knowledge in moderating climate threats in the face of climate change severity and intensity. Resultantly, previous studies prescribe the integration of scientific knowledge as a way of enhancing the effectiveness of traditional adaptation strategies and knowledge (Apraku, Morton and Apraku-Gyampoh, 2021;

Morgan and Murdoch, 2000; Ritchie, Roser and Rosado, 2022; Zvobgo *et al.*, 2022). Scientific knowledge is relevant in facilitating appropriate implementation and integration of other adaptation strategies to enhance effective adaptation to climate change. The evidence in my research demonstrates that traditional adaptation strategies and knowledge can be effective in climate adaptation when implemented appropriately and in adequate intensities.

Adaptation to climate change is strongly embedded with livelihood struggles. This complicates the understanding of climate adaptation and contributes to critical questions about people's adaptation practices and what they actually adapt to. In previous studies, questions such as 'adapt to what?' have been asked to understand what incentivises climate adaptation (Bryan *et al.*, 2009; Mertz *et al.*, 2009; Nyahunda and Tirivangasi, 2022; Smit *et al.*, 2000, p.224). To substantiate the complexity of understanding climate adaptation, previous gender and climate related studies implicitly discuss women's climate adaptation strategies as livelihood strategies (Bob and Babugura, 2014; Nyahunda and Tirivangasi, 2022; Masinga, Maharaj and Nzima, 2021). In my research, the embeddedness of climate adaptation and livelihood struggles is demonstrated through the similarity between adaptation strategies and survival strategies of smallholder women farmers. On-farm adaptation strategies such as intercropping are also employed as survival measures for boosting food availability whilst off-farm adaptation measures such as poultry keeping and casual work are used to generate income for addressing other welfare needs (cf. section 7.2). This signifies that the climate adaptation decisions that women farmers make are largely in response to their livelihood struggles and not necessarily in response to climate change. This corresponds with Rocheleau's *et al.* (1996) FPE's interpretation of environmental decisions such as adaptation to climate change as survival decisions. Interpreting

adaptation to climate change in the context of survival reveals certain departures from the mainstream understanding of climate adaptation. Adaptation to climate change is interpreted as adjustments to actual or expected changes in the climate and their effects (IPCC, 2022; UNDP, 2024). In this case, adaptation is understood as a response to climate change and not as a response to livelihood struggles. This understanding departs from that of women farmers who entwine climate adaptation with their struggles for survival. Therefore, limited embodiment of the connection between adaptation to climate change and survival in the comprehension of climate adaptation delinks theory from practice. Furthermore, this undermines nuanced comprehension of climate adaptation decisions of women farmers. The evidence in my study exemplifies that women comprehend adaptation to climate change as coping with livelihood struggles.

In conclusion, I assert that adaptation decisions of women farmers are largely constrained to traditional adaptation strategies and knowledge. This circumscription of women's adaptation decisions is configured by asymmetries in intra-household gender relations and reinforced and reproduced through the interactions of gendered institutions. In this way, adaptation options and decision-making spaces for women are limited in comparison to that of the men. Even though traditional adaptation strategies and knowledge are effective in moderating climate risks, imbalances in women's resource access and control, responsibilities and power compromises their effectiveness. The inadequacies of traditional measures are occasioned by inappropriate methods of implementation and adaptation intensities. So, most women are adversely affected by the effects of climate change despite employing traditional adaptation strategies.

8.2 Contribution to knowledge

There is scanty literature on the interactions between gendered institutions, their interconnections with intra-household gender relations and linkages to adaptation decisions of smallholder women farmers (Assefa and Gebrehiwot, 2023; Garcia and Tschakert, 2022; Hackfort and Burchardt, 2018). The existing scholarship on gender and climate change adaptation in Africa majorly centres on the effects of gender relations on women's adaptation to climate change and gender gaps in adaptation decision-making (Ahmed *et al.*, 2016; Aryal *et al.*, 2022; Alare *et al.*, 2022; Bomuhangi *et al.*, 2016; Rao, 2019; Van Aelst and Holvoet, 2018). In the context of institutions, a few studies outside Africa focus on the dynamics of intra-household gender relations and explain the contribution of institutions to farmers climate response (e.g. Bhattarai, 2020; Ravera *et al.*, 2016). Those within Africa concentrate on policy regulations and its implications on gendered climate adaptation (e.g. Bomuhangi, 2016; Bomuhangi *et al.*, 2016; Ongoro and Ogara, 2012). But the ways in which gendered institutions interact with each other and interlink with intra-household gender relations and configure adaptation decisions of women are rarely interrogated. Interrogating these linkages is critical in eliciting detailed comprehension of the constraints that women farmers confront in adaptation decision-making.

Therefore, through empirical evidence from Uganda, I broadly expound knowledge on gender relations and climate adaptation decisions. I also provide evidence on the interactions between gendered institutions and their interconnections with intra-household gender relations and implications for women's adaptation decision-making. This is undertaken by demonstrating that interactions between formal and informal gendered institutions configure intra-household gender relations with respect to resource access and control, division of responsibilities and power. These

configurations shape adaptation decisions of smallholder women farmers. I discuss the contribution this study makes to knowledge under three aspects: the forms of gendered institution interactions critical to women's adaptation decision-making, interactions of gendered institutions enabling women's adaptation decisions and contribution to FPE theory.

8.2.1 Forms of gendered institution interactions and women's adaptation decision-making

In this study, gendered institutions are demonstrated to diversely interact with each other and with intra-household gender relations. In the majority of gender and institution related scholarship, institutions are broadly recognised to interact in complex, unexpected and indirect ways (e.g. Chappell and Waylen, 2013; Kabeer, 1994; Rocheleau *et al.*, 1996; Wang, 2020; Waylen, 2017). However, rarely do previous studies interrogate the diverse pathways through which gendered institutions interact with each other and the connections between these interactions and women's adaptation decisions (e.g. Bhattarai, 2020; Mersha and van Laerhoven, 2019). With the guidance of Helmke and Levitsky's (2004) categorisation of institution interaction, this study utilises a gender lens to evidence the different ways that formal and informal gendered institutions interact with each other through accommodation, competition, complementary and substitution interactions. It further provides evidence of how the above stated forms of institutional interactions reinforce and reproduce encumbrances that undermine adaptation decision-making capacities of women farmers.

Moreover, this study further discloses accommodation and competition interactions evidenced through informal gendered institutions undermining formal gendered institutions as critical in shaping adaptation decisions of female farmers. This is

because they play a central role in restricting women's adaptation to traditional strategies, perpetuate inappropriate implementation of adaptation strategies and adaptation intensity by informal gendered institutions ignoring formal gendered institutions. The impediments of accommodation and competition interactions on women's adaptation decision-making are evidenced even when some intersectional characteristics such as the absence of male household head and sex of children enable some women to improve their capacities to make adaptation decisions more than others. This understanding of the forms of gendered institution interactions and their linkages to adaptation decisions show that informal gendered institutions compromise the capacities of formal gendered institutions to improve women's adaptation decision-making abilities.

8.2.2 Interactions of gendered institutions enhance women's abilities to make adaptation decisions

Facilitated by women's agency and male household heads adopting subtle approaches to navigate intra-household gender relations, the interactions of gendered institutions enhance the capacities of women to make adaptation decisions as delineated in the ensuing discussions.

This study exemplifies that women's strong sense of agency enhances the involvement of formal gendered institutions in addressing complex gender resource issues that impact adaptation decisions. Agency is evidenced through women's actions such as seeking the interventions of formal gendered institutions to address gender concerns. Resultantly, through complementary and substitution interactions, gendered institutions improve women's land access and the power to decide to adopt different climate adaptation measures. This demonstrates the capacity of women to

navigate adaptation decision-making constraints. It also departs from approaches that essentialise women's barriers to adaptation decision-making, by largely presenting women as 'victims' of climate change, which has been criticised in previous studies (e.g. Arora-Jonsson, 2011; Mersha & Van Laerhoven, 2016; Ngigi, Mueller, & Birner, 2017; Rao *et al.*, 2019; Van Aelst and Holvoet, 2018). These results are testament to the critical role of women's agency and other intersectional factors such as marital status and household headship in enhancing positive linkages between the interactions of gendered institutions and women's capacities to make adaptation decisions.

Through male household heads adopting subtle strategies to advance their interests, the interactions between formal and informal gendered institutions enhance women's capacities to make adaptation decisions. This is evidenced in this study through complementary interaction constructing some equities in intra-household gender relations. This is realised through the advancement of formal institutional objectives such as promotion of gender equity and popularisation of the negative repercussions of subordinating and oppressing women by both formal and informal actors of gendered institutions. In this way, male household heads refrain from employing confrontational approaches to advance their interests and adopt subtle strategies such as coming back home early during weeding seasons, paying children's school fees, being friendly to their women partners and involving women in family decisions. These strategies provide women with space to negotiate their adaptation decisions such as access to good quality land for farming and intercropping vegetables for food with crops farmed by male household heads primarily for commercial purposes. This deviates from the majority of African feminist scholarship that mostly exemplify women creatively negotiating gender power imbalances and eliciting space to advance their

decisions and actions using non-confrontational strategies such as silence, compromise and compliance (Agha, 2021; Arrey-Ngang, 2020; Gatwiri and Mumbi, 2020; Kawarazuka, Locke and Seeley, 2019). This study expounds creative negotiation of power relations by demonstrating male household head's adoption of similar strategies employed by women to negotiate gender power equities constructed through the interactions of gendered institutions.

8.2.3 Contribution to FPE theory

The contribution this study makes to FPE theory concerns the practicalities of undertaking gendered institutional analysis and women's elicitation of decision-making spaces using creative strategies.

In relation to undertaking gendered institutional analysis, Rocheleau's *et al.* (1996) seminal work illustrates that formal and informal structures are connected to the operation of the state, civil society, community, household and individuals. These perspectives are similar to the conceptualisation of the state, market, community and family as sites where formal and informal gendered institutions interact in SRA (Kabeer, 1994). In the earlier FPE perspectives, institutional interplays are stated to create 'powerful underlying structures which operate to the benefit of certain classes and groups' across local and international boundaries (Rocheleau *et al.*, 1996, p. 296). Despite FPE's recognition of institution interactions and their connections to environmental decisions, hardly are specific parameters for undertaking institutional analysis provided. By integrating SRA and Helmke and Levitsky's (2004) categorisation of institution interactions, a nuanced understanding of how gendered institutions interactively frame possibilities of environmental decision-making such as climate adaptation is gained. I demonstrate how to practically undertake institutional

analysis within a FPE theoretical context by exemplifying how gendered institutions interact through accommodation, competition, complementary and substitution interactions facilitated by official and non-official routinised practices. I also show how these interactions reinforce and reproduce disparities in gender relations and hindrances to women's capacities to make adaptation decisions.

In a similar way as male household heads discussed previously, this study provides evidence of women farmers creatively exercising agency and negotiating gender power asymmetries by seeking help from clan leaders or close relatives, complying with rules instituted by male household heads and fulfilling gender responsibilities. In this way, women farmers elicit space for deciding how to adapt to climate change. These results depart from FPE's perspectives about women's struggle for survival within male dominated spaces. In FPE's arguments, collective strategies such as movements, informal social networks, demonstrations and resistance are largely foreground as strategies that women use to struggle for survival (Graddy-Lovelace, 2017; Lamb *et al.*, 2018; Rocheleau's *et al.*, 1996). The forementioned strategies are described as ways through which women confront 'gender-based injustices, subordination and domination' (Rocheleau's *et al.*, 1996, p.295). There is limited recognition of other creative approaches that women employ to advance their environmental decisions and safeguard livelihoods such as those stated above (e.g. Agha, 2021; Gatwiri and Mumbi, 2020). Through an African lens, I provide evidence of alternative strategies that women employ to negotiate gender disparities and adaptation decision-making in their everyday lives. These perspectives expound FPE's relevance in guiding analysis of gendered institution interactions and their linkages to women's climate adaptation decisions in the African context.

8.3 Future Research

This study alludes that the interactions between gendered institutions reinforce and reproduce asymmetrical intra-household gender relations that constrain adaptation decisions of women farmers. Detailed insights on gender disparities in access and control over resources, responsibilities and power are gained through assessing the outcomes of the interactions of gendered institutions on intra-household gender relations guided by FPE and SRA theoretical framings (cf. section 3.4). My research demonstrates that asymmetries that inhibit women's adaptation decisions diversely interact at different institutional sites. Much as my focus is at household level so as to gain micro-level and context-specific understanding of these issues, insights of women's experiences in other spaces are relevant in attaining a more extensive understanding. For instance, societal expectations about how women conduct themselves is evidenced (cf. section 5.1.2), but still little attention was dedicated to exploring these issues in-depth. Therefore, future research could focus on investigating how interactions of gendered institutions configure gender relations in other spaces such as the community, state and market and how this connects with adaptation decisions of women farmers.

Cultural norms are shown to strongly configure intra-household gender relations and adaptation decisions of women farmers. My research found that some adaptation strategies are less adopted because they are regarded as inconsistent with cultural norms about women's behaviour (cf. section 7.2.2). But since norms evolve over time, there are some contextual variations this poses on adaptation decision-making. My study highlights some adjustments in perceptions influenced by other social factors, however discussions in this regard are quite narrow. So, it is vital for studies to dedicatedly commit to researching the changing patterns of cultural norms and their

linkage to adaptation decisions of women farmers. This would provide a detailed grasp of the scale and agency of adaptation to climate change and also guide interventions that aim at enhancing effective and gender equitable climate change action.

Membership in informal groups such as savings and lending associations is a strategy that most women farmers rely upon to solicit valuable resources such as finances and social support for implementing their adaptation decisions (cf. section 7.2.2). Groups are generally noted to positively influence climate response because they permit resource pooling and sharing which enhances vulnerable groups like women farmers to access critical resources (Ngigi, Mueller and Birner, 2017). But this study also highlights encumbrances such as low savings and restrictions from male partners. This impacts the extent to which the groups satisfactorily address the needs of their members. Other than concentrating on access to financial resources, barely is adaptation knowledge sharing among group members, collaboration and partnership between groups, government and non-governmental agencies explored comprehensively. Interrogating these issues in detail is critical in gaining breadth of knowledge on the climate adaptation opportunities that informal groups provide women farmers for sustainable climate response.

Methodologically, this research exclusively relied on qualitative participatory methods to collect data. Through these methods, in-depth data about intra-household gender relations, interactions of gendered institutions, their interconnections with intra-household gender relations and influence on adaptation decisions of women farmers was generated (cf. Chapter four). However, due to the complexity of my research focus, resources and time limitations, I narrowed my fieldwork geographical scope to two districts in Uganda and interacted with a small number of participants. This implies

that I collected context-specific data but then could not gain a wider empirical perspective on how the interactions of gendered institutions interlink with intra-household gender relations and configure adaptation decisions of smallholder women farmers in other contexts. Therefore, it would be useful for future research to broaden the geographical scope by incorporating quantitative methods so as to gain breadth of data and more generalised viewpoints on the issues studied.

8.4 Policy Recommendations

As already stated in the earlier sections of this Chapter (cf. section 8.2), this study generated valuable knowledge which is crucial for policy development and action. Gender disparities in women's access to and control over material and non-material resources, responsibilities and decision-making power constrain women's decisions to adapt to climate change. This links to the interactions between formal and informal gendered institutions and other specific issues such as gender insensitivity of certain institutions and characteristics of institutional actors as disclosed in my research and acknowledged by other scholars (e.g. Makina and Moyo, 2016; Valdivieso, Andersson and Villena-Roldán, 2017; Whaley, 2022). Whilst inferring from these, I am persuaded to propose that policies purposefully pay close attention to the unique needs and climate vulnerabilities of smallholder women farmers throughout their implementation processes. Perhaps this vigilance will contribute towards recognising and addressing any institutional practices that perpetuate unequal gender relations and adversely impede women's adaptation decisions and resilience.

Results in this study demonstrates women's strong reliance on local knowledge to adapt to climate change (cf. section 7.2). This exemplifies a nexus between the indigenous knowledge and the abilities of female farmers to respond to climate

change. This aligns with observations about the significance of traditional knowledge in facilitating climate adaptation advanced in previous studies (Akinagbe and Irohbe, 2015; Apraku, Morton and Apraku-Gyampoh, 2021; Rocheleau *et al.*, 1996; Zvobgo *et al.*, 2022). Therefore, I recommend that agricultural programmes integrate both scientific and traditional knowledge in agricultural and climate related training. In this way, local adaptation knowledge will be diffused, preserved and its effectiveness in moderating climate risks will be enhanced.

According to my study results, gaps between official objectives and actual implementation practices of gender and climate related programmes are apparent. This contributes to some formal gendered institutions that aim at enhancing equitable gender relations to reproduce disparities in intra-household relationships and climate response. Much as this associates with the interactions of gendered institutions, it also connects to ineffective operationalisation of gender and agricultural programmes and practices as shown in this research and previous studies (e.g. Ampaire *et al.*, 2020; Ampaire *et al.*, 2017; Morton, 2017). Based on this, I recommend regular monitoring and evaluation of the actual execution of climate adaptation and women empowerment related policies and programmes. This will probably improve realisation of desired objectives through disclosing existing inconsistencies and areas that require revision or strengthening.

There is proof of certain formal gendered institutions such as state and private agency policies inhibiting women's autonomous decision-making (cf. section 6.2). Therefore, for policies to be more relevant to the needs of vulnerable groups such as women farmers and to meaningfully contribute towards their socio-economic empowerment, I suggest incorporating women's views and that of local communities in policy

development. This will possibly address women's most pressing challenges and improve their decision making capacities and climate response. For climate policies to contribute towards a sustainable future, farmers participation is pivotal as this will ensure interests of different genders are accounted for (Arora-Jonsson, 2011; Denton, 2002).

The evidence in my research shows that informal gendered institutions, most especially cultural norms, negatively interact with formal gendered institutions in that they reinforce and reproduce gender power imbalances (cf. section 6.2). This foregrounds the centrality of cultural norms in constructing gender disparities in intra-household relations in consonance with previous studies (e.g. Ampaire *et al.*, 2020; Lawson *et al.*, 2020). It is based on this that I recommend that policies focusing on women's empowerment involve the perspectives of cultural leaders on how to achieve gender equity. The involvement of cultural leaders may enhance gender awareness within institutions and contribute effective ways of addressing gender concerns.

8.5 Conclusion

The interactions between gendered institutions reinforce and reproduce asymmetrical intra-household gender relations and mostly constrain women's adaptation decisions. Informed by these asymmetries, women decide to implement traditional measures using local knowledge. However, women's adaptation is largely inadequate due to inappropriate implementation of methods and adaptation intensities and not the type of adaptation strategies employed. This underpins the intricate effects of deeply entrenched asymmetrical gender relations that not only restrict adaptation decisions to traditional strategies but also compromise appropriate implementation and integration of other measures to boost effective adaptations. Drawing from these

observations, I assert that constraints to women's adaptation decisions are continuously being constructed and reconstructed. This presents critical implications for climate adaptation and sustainable livelihoods of women farmers.

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APPENDIX 1: PARTICIPANT INFORMATION SHEET

Project title

Adaptation to climate change: Gender relations and decisions of smallholder women farmers in Uganda

Introduction

You are being invited to participate in this research which focuses on understanding how climate change adaptation decisions of smallholder women farmers are shaped by gender relations. Before deciding whether or not to take part it's pertinent for you to understand the purpose of this study and what your involvement means. This is explained in the subsequent sections of this document.

Study description

This project is part of a PhD programme being pursued at International Development Department (IDD) in the University of Birmingham – UK with funding from Commonwealth Scholarship Commission (CSC) and University of Birmingham. More specifically, it investigates the adaptation strategies women decide to implement and how the manner in which they relate with males with respect to resources, responsibilities and power contribute to those decisions. This research will be conducted within a period of four months – March and June 2022 and, it will involve participants from Budaka and Kween districts. Its purpose is to generate insights from the perspectives of participants so as to understand adaptation decisions of smallholder women farmers and its linkage to gender relations. In this way, evidence for discussions, learning and action with the aim of enhancing agricultural adaptation to climate change among all smallholder farmers will be generated.

Study participants

You have been selected to participate in this research because you are a farmer or develop and implement climate change, agricultural and gender related projects, programmes and policies and are eighteen (18) years and above of age. Therefore, your experience, knowledge and insights can be very useful in this research since at least, you are familiar with climate change, interact or work with male and female smallholder farmers or adapt to climate change using certain strategies. Through your participation, in-depth comprehension of women's experience of climate change, adaptation, gender relations and how women's adaptation decisions have been influenced will be gained.

What the participant will be asked to do

When you decide to participate in this research, you will be invited to be involved in the entire study. This study will employ different methods of data collection which will take approximately between 30-45 minutes. Therefore, depending on your capacity and willingness to be involved, you may participate in some methods or all. Methods of research such as focus group discussion, semi-structured interview, gender resource mapping, seasonal calendar, transect walk and Venn diagram will be used to aid interaction. You will be requested to share your experiences about climate change, adaptation strategies, adaptation decision-making at the household, and the relationship between men and women with respect to resources, responsibilities and power. Photographs will be taken and voices recorded during different field activities.

Risks and benefits of being involved in this study

Risks

There are no major foreseeable risks of harm or discomfort that may arise from participating in this study other than those associated with discomfort related with participants sharing certain information, the inconvenience of participants spending time engaging in interviews and focus group discussions and, the possibility of the research team and participants contracting Covid-19 during field activities. Therefore:

- i. As you share your experiences about climate change adaptation decisions and the relationship between men and women with regards to resources, responsibilities and power, you may be compelled to share sensitive information. This may include issues related to conflicts over resources, power, gender violence, neglect and abuse which may pose emotional distress, anxiety, damage of reputation and acts of reprisal from other participants unhappy with particular criticisms or opinions expressed. For that reason, you are encouraged to share what you feel comfortable talking about. In addition, all information that you share will be kept confidential. No other members other than the research team will gain access to it.
- ii. For the case of time related inconvenience, you will be informed about the duration of each field activity in advance. After this, your consent or thoughts will be sought and mutually agreed upon. In case you feel like leaving to attend to other commitments, you will be permitted.
- iii. Due to Covid-19, you are requested to wear a face covering, social distance and adhere to regular handwashing or hand sanitising during all field activities. This will prevent the risk of you getting infected or infecting others.

Benefits

Your participation in this research is critical because it will generate results which will contribute towards discussion and learning on how climate change adaptation decisions of smallholder women farmers link to gender relations. These results will be disseminated through publication in academic journals, research briefs, presentation in national and international conferences and seminars as well as discussions in other formal and informal fora like meetings. In this way, more insights that will inform policy and practice that target enhancing women's adaptation to climate change at the local government, national, regional and international levels will be elicited.

Moreover, since the process of this research is open it might not be possible to typically guarantee its national benefits. However, it's expected that it will contribute to a better understanding of how adaptation decisions of smallholder women farmers link with the manner in which men and women relate with respect to resources, responsibilities and power. This will inform Uganda's future interventions that aim at improving agricultural adaptation to climate change among both male and female farmers.

Lastly, as you interact and share your experiences you will be learning from one another about climate change adaptation measures and how others have uniquely

worked through prevailing gender relations to implement different adaptation strategies. These lessons will improve your adaptation agency. Besides, it will also provide the opportunity for you to meet with fellow farmers, establish contacts and build networks which can be helpful now and in the future.

Confidentiality

Participant's involvement in this study will be kept confidential. All information collected about you and from you will be strictly kept confidential and will only be accessed by members of the research team. You will not be identified in any reports or publications and, your data will not be stored in an identifiable format.

Voluntariness

You are being requested to participate in this study voluntarily. Therefore, it's important for you to understand the purpose of this research and what it entails before you can decide whether or not to involve. You could discuss with others so as to gain a better understanding and also ask questions in case there are things you do not understand. Having understood the project and its purpose, you can decide whether to participate or not to take part in this study. In case you choose to participate its voluntary and you can withdraw whenever you feel like during the fieldwork period and two weeks after its completion that is – between March and the 2nd week of July 2022. In case you withdraw, your data will be deleted and there will be no penalty for doing so. All that you are asked to do is to inform a member of the research team of your withdrawal.

Compensation /Reimbursement

A transport refund of £2 will be paid to focus group participants. However, if a participant withdraws before taking part in any of the field activities no compensation will be provided but if it's after they will be compensated.

Refreshment

A bottle of soda and a cake will be served for each participant during the focus group discussions.

Feedback/Dissemination

Study findings will be shared with participants and government officials through two community meetings which will be held in Budaka and Kween districts. The results of this research will form part of my PhD thesis and will also be presented in research conferences and seminars, publication in academic journals and discussions in formal and informal fora. At a later time, policy and research briefs will be designed so as to solicit discussion, learning and action on women's adaptation to climate change.

Ethical Clearance

Ethical clearance has been sought from the University of Birmingham central ethics committee.

Contacts and questions

In case you have any concerns or questions about this research, please contact the following persons who will respond to all your questions. Their contacts are:

1. Flavia Amayo, PhD student – International Development Department (IDD), University of Birmingham. Email: [REDACTED] Telephone: [REDACTED]
2. Professor Fiona Nunan, Supervisor – International Development Department, University of Birmingham. Email: [REDACTED] Telephone: [REDACTED]
3. Asmailah Nagudoyo, Field Assistant – Budaka. Email: [REDACTED] Telephone: [REDACTED]
4. Leonard Musawo, Field Assistant – Kween. Email: [REDACTED] Telephone: [REDACTED]

APPENDIX 2: INFORMED CONSENT FORM

Project title

Adaptation to climate change: Gender relations and the decisions of smallholder women farmers in Uganda.

Statement of fair processing

The data being generated from you is part of a project which aims at understanding how climate change adaptation decisions of smallholder women farmers are influenced by gender relations. This study is undertaken by Flavia Amayo who is pursuing a doctoral degree in International Development Department (IDD) at the University of Birmingham – UK and it will form part of her thesis. All information that you provide and that which will be collected as part of this study will be securely filed or entered into a database. It will only be accessed by the researcher and other authorised members taking part in this research. By providing this information you are consenting to your data being stored in accordance with University of Birmingham code of practice of research and the Data Protection Act 2018 for the abovementioned purpose. Under no circumstance will identifiable personal data be published.

Statements of understanding/consent

I confirm that I have read the participant information sheet or had it read and explained to me. I have had the opportunity to ask questions, if necessary, received answers to all questions and I am satisfied. Therefore:

- i. I understand that my participation is voluntary and that I am free to withdraw at any time from the commencement of my involvement in this research up to the 2nd week of July 2022 without giving any reason. If I withdraw my data will be deleted from the study and destroyed ☐
- ii. I understand that my personal data will be processed for the aforementioned purpose in accordance with University of Birmingham code of practice of research and Data Protection Act 2018 ☐
- iii. I am aware that photographs of my garden and homestead will be taken and used in different publications ☐

- iv. I understand that my voice will be recorded during interviews and focus group discussions ☐ v. I am at least years of age.
- vi. Based upon the above, I consent to take part in this study ☐

Name of participant.....Date..... Signature/thumb print.....

Name of researcher/person obtaining consent.....Date.....Signature.....

APPENDIX 3: FIELD ASSISTANT CONFIDENTIALITY AGREEMENT

Name of field assistant:.....

Project Title: Adaptation to climate change: Gender relations and the decisions of smallholder women farmers in Uganda

Researcher: Flavia Amayo

Start Date: 01 March 2022

I am cognisant that as I execute the duties and responsibilities of a field assistant in this research, I will have access to information that participants provide and that which will be collected as part of this study. I understand that I must keep such information confidential and will only be used in relation with the work assigned to me by the research lead – Flavia Amayo. Personal use or sharing of this data is strongly barred. Under no circumstance will I retain, recover and reproduce such information for any personal use.

I confirm that I have read and understand this confidentiality agreement.

Signature: Date:

APPENDIX 4: INTERVIEW GUIDE QUESTIONS FOR WOMEN FARMERS

Activity 1A: General questions

1. How long have you lived in this village? For how long have you been farming and how did you get into farming?
2. What are your farming activities? Do you farm with members of your household?
3. What crops do you cultivate and what animals do you rear if any?
4. Where do you cultivate these crops? And why?
5. What size of land do you cultivate on? What is the quality of that land?
6. Do you cultivate on any other land away from your household?
7. What other income generating activities do you undertake?
8. Who are the members of your household? What do they do for a living?
9. What changes has taken place in recent years with respect to:
 - Farming seasons
 - Crops that you cultivate
 - The farming practices that you use
10. In what ways have you acted upon these changes?

11. How are men and women expected to behave in your village? Has this changed in any way?
12. Do you experience any constraints in farming? What are these constraints? Where do they come from?
13. Are these constraints experienced by all women in this village?

1B: Coping with climate change

1. Have you noticed any changes in the weather patterns? If yes, since when? What are those changes?
2. In what ways have changes in the weather affected your farming activities?
3. Have you coped with these changes in any way? What strategies do you use and why?
4. Are there any constraints that you face when applying these strategies? What are these constraints and what have you done to address them?

Gender relations and adaptation decisions

Activity 2: Material resources

Gender resource mapping is an independent field activity which will aid discussion under this section. Participants who can read and write will draw the map of their homestead while those who cannot be helped by either a member of their household or the project field assistant. Discussion questions will majorly focus on what resources household have, those women access and utilise and how decisions that pertain the use of those resources are made guided by the questions below:

1. What resources do you use to help you cope with weather changes?
2. Who owns and controls these resources? How are they managed in your household?
3. How do you access these resources? How do you feel about how you access these resources?
4. In what ways has the manner in which you access resources affected how you use them?
5. How has your access to resources affected how you cope with changes in weather patterns?
6. What have you done to ensure that you address the challenges of weather changes despite how you access the required resources?

Activity 3: Human resources and Social capital

3A: Human resources

1. How do you acquire knowledge and skills on climate change and how to cope with its effects?
2. In what ways do your households members support/not support you to attain this knowledge?
3. Has this affected your choice about what coping strategies to use?
4. Have you been able to implement all the knowledge that you have about agricultural responding to weather changes?
5. What affects how this knowledge is utilised in your household?

3B: Social capital

1. What groups, associations or networks do you engage in? Who are the members?
2. How were these groups or networks formed and for what purpose?
3. How are decisions made within these groups or associations?
4. Do these groups or associations work with any state or private agency? In what areas do they collaborate?
5. How do you feel about how you participate in this group/network as a member?
6. Has your membership in this group affected how you relate with your household members?
7. Has it contributed to your ability to decide how to cope with weather changes?

Activity 4: Responsibilities, power relations and agencies

4A: Responsibilities

1. What farming responsibilities do you hold in your household? How are these responsibilities allocated?
2. Other than the household, do these responsibilities extend to the community?
3. How do you feel about these responsibilities and how they are distributed?
4. Do you feel compelled by these responsibilities to cope with weather changes using certain strategies? Why is it so?

4B: Power relations

1. What does your household consider when deciding how to cope with weather changes? How are these decisions made?
2. How do you feel about how these decisions are made in your household?
3. Who decides what strategies your household can utilise to cope with weather changes?
4. Has this in anyway affected the decisions that you have made regarding what coping strategies to use?

4C: Agencies that work with smallholder farmers

1. What agencies work with smallholder farmers?
2. What category of smallholder farmers do they work with? And, what do they seek to achieve?
3. How do these agencies identify who to work with?
4. In what ways have they contributed to women's access and control over resources?
5. Has this affected how responsibilities are shared at household level?
6. In what ways has working with these agencies influenced decision-making power in the household?
7. Has this contributed to your decisions about what adaptation strategies to implement in any way?

Note: Each activity will be conducted on separate days.

APPENDIX 5: INTERVIEW GUIDE FOR AGRICULTURAL OFFICERS

I appreciate you for taking time to speak to us today. Your participation in this research is highly valued. I would like us to start with some general questions about your work in this department. If it's fine with you, we then proceed to talk about agriculture, climate change, gender relations and the adaptation strategies that farmers utilise.

General issues work and life in the village

1. When did you start working in this department?
2. What does your work entail?
3. What has been your experience working with smallholder farmers?
4. What agencies work with farmers in this sub county?
5. Are there any farmer groups/associations/networks that women are involved in?
6. Do male farmers also engage in groups/associations/networks? If yes, in what ways?
7. What major changes have taken place in the recent years with regards to:
 - Crops that farmers cultivate
 - Farming seasons
 - Farming practices
8. What has caused these changes?
9. Do these changes present any challenges to smallholder farmers? What sort of challenges? Why are they challenges?
10. How are male and female farmers affected by these challenges?

Adaptation to climate change

1. How has the climate changed? And over what period of time?
2. In what ways have changes in the climate affected farming?
3. What adaptation measures do farmers implement? Are these strategies used by both male and female farmers?
4. Are there any constraints that women face when applying these strategies? What are these constraints? In what ways has your department worked with women to address these constraints?
5. What cultural norms regulate how men and women behave? Does this affect the farming activities that men and women participate in? In what ways?
6. Have these norms in anyway affected the participation of men and women in programmes that your department implements? What programmes were affected? In what ways were they affected?

Gender relations and adaptation decisions

Material resources

1. What resources do women have access for their farming? How do they access these resources? Is this case for male farmers?
2. In what ways does your department ensure that all farmers – male and female access the resources that they need for productive farming?
3. Have farmers changed their farming practices because of how they access resources? If yes, how? Does this differ between men and women? Why is it so?

Human resources

1. How do farmers acquire knowledge and skills about climate change and how to cope with the changes it brings?
2. What sort of training programmes does your department offer? Who are the beneficiaries of these programmes? How are they identified?
3. Are there any constraints that women farmers face with regards to utilising climate change knowledge and skills that they have acquired? What are these constraints? In what ways are they affected?
4. What interventions have been implemented to address these constraints?

Social capital

1. What groups, associations or networks are women engaged in? Who are their members?
2. How are these groups or networks formed and for what purpose?
3. Do these associations work with any state or private agency? In what areas do they collaborate?
4. In what ways do women participate in these groups/networks? Has it contributed to their ability to decide what adaptation measures to implement?

Responsibilities

1. What farming responsibilities do women majorly hold?
2. Who allocates these responsibilities and, how is it done?
3. Do these responsibilities differ in any way according to households or it's shared across the community?
4. In what ways have these responsibilities affected women's involvement in the programmes that your department offers to farmers?
5. Do these responsibilities in any way compel women to use certain farming methods so as to cope with climate change? Why is it so?

Power relations

1. Who decides what adaptation strategies to implement in a household?
2. What sort of adaptation decisions do households make? How are these decisions made?
3. Does this affect the farming practices of women?

APPENDIX 6: INTERVIEW GUIDE FOR GENDER OFFICERS

We appreciate you for taking time to speak to us today. Your participation in this research is highly valued. We would like to start with some general questions about your work in this department. If it's fine with you, we then proceed to talk about gender, relations and household decisions.

General issues

1. When did you start working in this department? What does your work entail?
2. Other than your department, what other agencies offer gender related services in this district? Who are their beneficiaries? How are they identified? What programmes do they implement?
3. Does your department work with these agencies? In what ways?
4. What sort of gender issues does your department address? What category of people visit your office more to seek help? Why is it so?
5. Are there any ways men and women are expected to behave in this society? If yes, how? Why is it so?

6. Does this affect the responsibilities, resources and decision-making power that men and women possess? In what ways?

Gender relations and adaptation decisions

1. What resources do households rely on to earn a living?
2. Who owns these resources? Who has the power to decide how they are utilised? How are these decisions made? How do women access these resources? Is this case for men?
3. Are there instances when household members conflict? If yes, who conflict? Why do they conflict?
4. Does your department address such issues? In what ways?
5. Are there any groups/associations/networks that women are involved in? What are they? How are they formed? For what purpose? In what ways do women participate?
6. What sort of groups or networks are men involved in? How are they formed? For what purpose?
7. How do household members support each other to participate in groups, associations or networks?
8. What household responsibilities do men and women farmers majorly hold? Who allocates these responsibilities and, how is it done?
9. Do these responsibilities differ in any way according to households or it's shared across the community?
10. In what ways have these responsibilities affected women's involvement in the programmes that your department offer?

APPENDIX 7: FOCUS GROUP DISCUSSION: GUIDING QUESTIONS

General questions

1. What farming activities do women in this village engage in?
2. What crops do women cultivate and what animals do they rear if any?
3. Why are these crops cultivated?
4. On what size of land are these crops cultivated? What is the quality of this land? Who owns and controls it?
5. What other income generating activities do women farmers engage in?
6. How are men and women expected to behave in this village? Has this changed in any way? Over what period of time?
7. How has it affected the responsibilities that men and women hold in a household?
8. Are there any constraints on what women can do in farming? What are these constraints? Where do they come from?
9. Are these constraints experienced by all women in this village?

Adaptation to climate change

1. How has the weather changed? And over what period of time?
2. In what ways have changes in the weather affected farming?
3. Do women utilise any strategies to mitigate the risks of these changes? Why do they choose those strategies?
4. Are there any constraints that women face when applying these strategies? What are these constraints and what has been done to address them?

Gender relations and adaptation decisions

Material resources

1. What resources do smallholder farmers use for farming?
2. What resources do women need to respond to weather changes? climate change
3. Who owns and controls these resources in the household? And how are they managed?
4. How are decisions about how to utilise these resources made?
5. How do women access these resources? Has this affected women's decisions about what coping measures to implement? In what ways?

Human resources

1. How do women acquire knowledge and skills on responding to weather changes?
2. In what ways do household members contribute to women's attainment of such knowledge and skills?
3. Has this affected how women decide to cope with weather changes? In what ways?
4. Is the utilisation of this knowledge and skills in the household constrained in any way? In what ways? What do women do address to address these constraints?

Social capital

1. What groups, associations or networks are women engaged in? Who are the members?
2. How are these groups or networks formed and for what purpose?
3. How are decisions made within these associations?
4. Do these associations work with any state or private agency? In what areas do they collaborate?
5. In what ways do women participate in these groups/networks? Has this involvement how they relate with household members?
6. Has it contributed to their ability to decide what adaptation measures to implement?

Responsibilities

1. What farming responsibilities do women hold in this village?
2. Who allocates these responsibilities and, how is it done?
3. Do these responsibilities differ in any way according to households or it's shared across the community?
4. How do women feel about these responsibilities and how they are distributed?
5. Have these responsibilities compelled them to respond to weather changes using certain strategies? Why is it so?

Power relations

1. What do household consider when deciding how to cope with weather changes? How are these decisions made? Is this the case for all households in this village?
2. How do you feel about how these decisions are made?
3. Who decides what strategies a household can utilise to cope with weather changes?

4. Has this in anyway affected the decisions that women regarding what coping strategies to use?

Agencies that work with women farmers

1. What agencies work with farmers in this village?
2. What category of farmers do they work with? And what do they seek to achieve?
3. How do these agencies identify who to work with?
4. In what ways have they contributed to women's access and control over resources?
5. Has this affected how responsibilities are shared at household level?
6. In what ways has working with these agencies influenced decision-making power in the household?
7. Has this contributed to women's decisions about what adaptation strategies to implement in any way?