



LUND
UNIVERSITY

Master of Science

International Development and Management

May 2020

**A Climate of Difference:
Gender, Farming, and Climate Variability**

An investigation into the varied experience of gender vulnerability and agency among small-scale farmers in Ky Anh district, Central Vietnam



Author: Eoin O'Dwyer
Supervisor: Agnes Andersson Djurfeldt

Abstract

This study explores gender identity, vulnerability, and agency in the lives of smallholder farmers, within the context of climate variability in Ky Anh, Central Vietnam. The study first explores how gender identity and power relations are constructed within everyday rural practices. The analysis then extends to examine how men and women experience differential vulnerabilities concerning changes such as climate variability. Finally, an intersectional analysis explores the agency and diversity within the experience of gender vulnerability and adaptation. A qualitative case study approach was utilized in which semi-structured interviews, focus group discussions, and key informant interviews provided primary data. The results indicate that gender discourses surrounding strength, skill, and authority shape gender identity and power in rural practices. It was found that men's identity facilitates their entry into the non-farm economy, while women's farming responsibilities are enlarged as a result. Women are actively coping with the consequences of climate variability, but their time, labor, and mobility are significantly impacted. Despite these common experiences, the results also highlight the intersectional and differentiated experience of gender vulnerability along the lines of class, age, and marital status. Agency within intra-household relations, and an individual's social relations emerge as key factors for improving adaptive capacity.

Key words: Gender, Climate Variability, Differentiated Vulnerability, Agency, Intersectionality

Word count: 14,996

Cover photo: Ky Phu rice plains. January 2020 by Eoin O'Dwyer

Acknowledgements

I want to thank the women and men who shared their experiences of living and farming in Ky Anh. I will always be grateful for the time they afforded me from their busy schedules to answer my questions and participate in focus groups.

I wish to thank my internship supervisor, Nozomi Kawarazuka, for the opportunities she has given me, for the knowledge and insights she shared with me, and for her friendship during my time in Vietnam.

The staff at ICRAF deserve special acknowledgment for their help with field access and advice for data collection. In particular, I want to mention Elisabeth Simelton and Tam Le Thi for their time and help throughout this process.

My sincere thanks to my thesis supervisor Agnes Andersson Djurfeldt for her direction and advice during the thesis process.

Lastly, I want to thank my family and partner for always encouraging me in this thesis and beyond.

Table of Contents

Acknowledgements	3
List of Figures, Tables, and Photos	5
Abbreviations	6
1. Introduction	7
1.1. Research Problem.....	7
2. Background	10
2.1. Gender, Agriculture, and Climate Change	10
2.3. Ky Anh District.....	11
3. Conceptual Framework	14
3.1. Gender Vulnerability and Adaptive Capacity	14
3.2. Feminist Political Ecology.....	15
3.3. Gender Performativity.....	16
3.4. Agency	17
3.5. Intersectionality	18
3.6. Operationalization	19
4. Literature Review	20
4.1. Farming Identities	20
4.2. Gender Identity, Vulnerability, and Adaptive Responses	20
4.3. Agency and Intersectionality within Rural Livelihoods	21
4.3.1. Age, Marital Status, and Class	22
5. Methodology	24
5.1. Research Design and Strategy	24
5.2. Epistemological and Ontological Understandings.....	24
5.3. Data Collection Process	25
5.4. Data Collection Methods.....	25
5.4.1. Sampling	25
5.4.2. Semi-Structured Interviews.....	26
5.4.3. Focus Group Discussions.....	28
5.4.4. Key informant Interviews	28
5.4.5. Additional Methods.....	28
5.5. Data Handling and Analysis	29
5.6. Ethics and Reflexivity.....	29
6. Analysis and Discussion	31
6.1. Gender Identity and Power in Everyday Practices.....	31

6.1.1.	Gendered Farming Practices	31
6.1.2.	Practices at Home.....	33
6.1.3.	Decision-making	34
6.2.	Gender Vulnerability, Adaptation and Coping to Change	36
6.2.1.	Feminization of Farming.....	36
6.2.2.	Agricultural Adaptation and Coping Strategies	37
6.3.	Agency and Intersectionality within Gender Vulnerability and Adaptation	41
6.3.1.	Intra-Household Relations	41
6.3.2.	Vulnerability Across Life Cycles.....	43
6.3.3.	Class and Gender	44
6.3.4.	Female-Headed Households	45
7.	Conclusion	49
7.1.	Research Implications	50
	References	51
	Appendix A: List of Informants.....	60
	Key Informant Interviews	61
	Female Focus Group Discussion	61
	Male Focus Group Discussion	61
	Appendix B: Semi-Structured Interview Guide	62
	Appendix C: Focus Group Guiding Questions.....	66

List of Figures, Tables, and Photos

Figure 1.	Ky Anh Site Map.....	12
Table 1.	Summary of Data Methods	27
Photo 1.	Activity Discussion Cards.....	27
Figure 2.	Ladder of Power and Freedom	28
Figure 3.	Results from the Ladder of Power and Freedom.....	35

Abbreviations

FFG	Female Focus Group
FHH	Female Headed Household
FPE	Feminist Political Ecology
FR	Female Respondent
FU	Farmer's Union
ICRAF	International Council for Research in Agroforestry
KAG	Ky Anh Government
KHC	Ky Hai Commune
KI	Key Informant
KPC	Ky Phu Commune
LPF	Ladder of Power and Freedom
MFG	Male Focus Group
MHH	Male Headed Household
MR	Male Respondent
RQ	Research Question
VND	Vietnamese Dong
WU	Women's Union

1. Introduction

This thesis explores the lives of male and female smallholder farmers in the context of climate variability in relation to gender-differentiated vulnerability, agency, and intersectionality. The following section lays out the research problem and specific research questions.

1.1. Research Problem

Vietnam has been identified as one of the most vulnerable countries to climate change in the world (Schmidt-Thomé et al., 2015; WB, 2010). With 3260km of coastline, low-lying deltas, and its location in the path of Southeast Asian monsoons and Western Pacific typhoons, Vietnam is particularly exposed to rising sea levels and weather extremes (Fortier, 2010). Its high exposure is combined with sensitive socioeconomic structures and a low capacity to adapt these structures to change (Fortier, 2010). Over seventy percent of the Vietnamese population live rurally, and sixty percent identify agriculture as their livelihood source (Bergstedt, 2016). Impacts such as increased storms, hot spells, cold spells, floods, and drought are already being felt and are affecting household decision-making, including what crops are chosen and when they are planted and harvested (McElwee, 2017). However, smallholder farmers are not just adapting to a changing climate but are also responding to multiple factors and stressors such as reduced crop prices and market losses (McElwee, 2017).

It is well established that the impacts of climate variability are not felt uniformly (IPCC, 2014). While this is evident across different geographies, it can be less apparent across different social groups in society. Although research has begun to focus on impacts along the lines of gender, class, and ethnicity to explain why some groups or individuals have a differential experience of climate variability, the focus is often placed on biophysical changes rather than tracing causality back to their roots in social structures (Tsachkert, 2012). Studies in this realm often have the gender division of labor as their starting point but ignore the relations of hierarchy and control found within the division (Mukhopadhyay & Prügl, 2019). This often portrays women as passive agents experiencing static vulnerability, while also generalizing and masking the diverse experience of gender vulnerability and adaptation (Arora-Jonsson, 2011; Eriksen et al., 2015). Similarly, this focus tends to ignore the power relations that are embedded within the gender identities that produce inequitable environmental relationships (Resurrección, 2017, 2019). Gender vulnerability is understood as the inability to cope and adapt to changes or system shocks as a result of entrenched gender structures, identities, and power relations that

shape resource access, the division of labor, decision-making and mobility (O'Brien et al., 2007; Rao et al., 2020).

Although gender analysis in climate change research has been advanced by some scholars, they note that there remains a need for further research that analyses the social roots of gender vulnerability (Pearse, 2017, Jerneck, 2018; Yadav & Lal, 2019). In response to this framing of gender and climate variability, many authors have called for the inclusion of feminist theory that focuses on identity formation and the intersectional power-laden processes through which vulnerability emerges and is contested in the practices of men and women (MacGregor, 2010; Djoudi et al., 2016; Kaisjer & Kronsell, 2014). Additionally, research in Vietnam has often focused on the environmental vulnerabilities of climate change but ignored its gender dimensions, which continues to remain limited (Dasgupta, 2019).

1.2. Statement of Purpose and Research Questions

This case study will explore the concepts of gender identity, vulnerability, and agency within the lives of smallholder farmers in Ky Anh, Central Vietnam in the context of climate variability. In this way, the study is not primarily about climate variability, but it provides the backdrop. The analysis starts by broadly investigating how gender vulnerability is created and maintained in language and practices on the farm and in the household. Following this, the focus is narrowed down to individual cases in order to explore the intra-household dynamics and intersecting social relations that can enable or delimit agency to contest gender structures and vulnerability.

Aim

- To explore the role of gender identity and agency in producing gender vulnerability and adaptive responses to change in Ky Anh

Research Questions:

1. How are gender identity and power constructed in everyday rural practices in Ky Anh
2. How and why does gender identity create differential gender vulnerability and adaptations for men and women?
3. How and why does gender vulnerability and adaptive capacity vary with agency and intersectionality?

Chapter two presents a background of the Vietnamese context and Ky Anh district specifically. The conceptual framework is presented in Chapter three. Chapter four outlines and reviews key literature. Chapter five presents the methodological considerations. Chapter six presents the analysis and key findings and analysis from this study. Finally, Chapter seven will draw conclusions and research implications for the study.

2. Background

Vietnam has experienced significant environmental, social, and economic change over the last three decades which has affected the climate, agriculture, gender-relations, and the economy (Bergstedt, 2016). This section positions these changes in the context of the case study.

2.1. Gender, Agriculture, and Climate Change

Under Confucianism, ‘three submissions’ organized a woman’s life through childhood, marriage, and widowhood, and her three masters were found in her father, her husband, and her son (Marr, 1984). Sons however held important social status as they perform funeral and ancestral religious rituals (Jacobs, 2008). Labor shortages during the Vietnamese conflict (1955-75) allowed women to take up positions in agriculture, industry, and local government (Teerawichitchainan, 2010); a situation reversed following its conclusion (Goodkind, 1995). The socialist regime that followed attempted to displace Confucian gender ideologies by targeting household gender roles through social programs to share and reduce domestic work (Teerawichitchainan, 2010).

Vietnam's *doi moi*¹ policy transformed the state from a centrally planned to a liberalized market economy in the late 1980s, leading to impressive economic growth, rapid poverty reduction, and improved living standards (Teerawichitchainan, 2010). This structural change de-collectivized agriculture and each household unit was given a plot of land (Long et al., 2000). Further reforms enabled smallholder farmers to access agricultural inputs such as fertilizer and modified seeds, alongside the ability to inherit and purchase land (Tarp, 2017). These farming changes led to significant jumps in agricultural productivity and food security such that Vietnam quickly became a major rice exporter (Long et al., 2000). With increased supply, the price of rice dropped significantly, and smallholder farmers became more exposed to global market shocks (Tarp, 2017). *Doi moi* also relaxed the household registration system, fueling internal migration and urbanization (Hanh et al., 2017).

While there is evidence that liberalization increased women’s education, income, employment, and mobility (Desai, 2011; Hanh et al., 2017), many critics argue that *doi moi* allowed patriarchal traditions to regain prominence (Goodkind, 1995; Luong, 2003). It has been argued

¹ Doi Moi is the name given to the package of economic reforms that began in 1986 (Tarp, 2017).

that compared to rural men, women have lost out as agricultural de-collectivization saw the feminization of subsistence farming, significant female unemployment, and informalization (Jacobs, 2008). The reinstatement of men as the manager of farming and household labor allocation resulted in less time and mobility for women due to increased household responsibilities (Jacobs, 2008). Despite developments such as the 2007 Law on Gender Equality, Confucian legacies evident in ‘son preference’, female predominance in unpaid household work, and acquiescence to male authority remains strong in rural areas (Goodkind, 1995; Teerawichitchainan, 2010). Also, changes to societal relations during *doi moi* have in many ways weakened the capacity of rural society to adapt due to its dependence on industrial agriculture, and the loss of knowledge, skills, and social networks (Fortier, 2010).

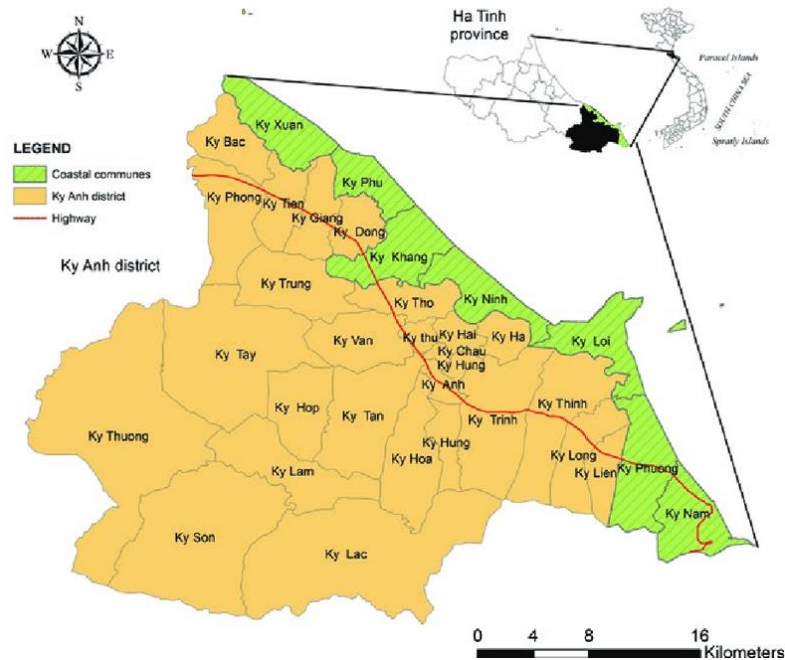
The Vietnamese government has responded to increased climate challenges with a National Strategy on Climate Change (McElwee, 2017). The strategy is largely technocratic and has been criticized as being a continuation of past economic policies rather than transformative change, with action plans surrounding flood defenses, irrigation systems, and modified crops (Christoplos et al., 2017; Fortier, 2010; Ylipää et al., 2019). Little importance has been placed on more generalized adaptation such as diversified livelihoods or building local social networks that build adaptive capacity to an uncertain future (McElwee, 2017; Fortier, 2010). Rather than a changed system, such policies reinforce existing power-relations and minimize the role of agency in dealing with such changes (Fortier, 2010).

2.3. Ky Anh District

Ky Anh is located in the southwest corner of the coastal province of Ha Tinh. While Vietnam has a poverty rate of 5.8%, Ha Tinh province is higher at 11% (GSO, 2018). Future scenarios predict Ky Anh as particularly exposed to intense climate change (MoNRE, 2011). Current impacts manifest as increased temperatures, displaced wet and dry seasons, drought, heavy rainfall, unpredictable ‘hot’ and ‘cold’ periods, and increasingly frequent and intense storms and flooding (Nguyen & Hens, 2019). The storm season has extended by two months to encompass August and December (Nguyen & Hens, 2019). Unpredictable weather is displacing traditional planting seasons, and frequent variations between hot, cold, and rainy weather is killing seedlings and causing an increased incidence of disease (Nguyen & Hens, 2019). Storms and floods have destroyed crops, houses, and aquaculture plots. Apart from flood

defenses along riverbanks, there has been limited government-led adaptation in Ky Anh, except for a new irrigation system that has been recently constructed.

Figure 1. Ky Anh Site Map



Source: Nguyen and Hens (2019)

Ky Anh has an area of 1.059km² and is bordered to the west by 63km of coastline. Within its catchment, Ky Anh has a population of 119,772 (50.5% male and 49.5% female) and is largely a Kinh ethnic area (99.94%) (Nguyen & Hens, 2019; KAG, 2019). The district is mostly agricultural and dominated by rice farming. Other major crops are cassava, peanuts, fruit trees, and vegetables. Aquaculture is also an important supplement to rice farming. However, farming has become devalued due to reduced markets and income alongside the effects of climate change; with men moving to non-farm jobs.

The majority of farmers have access to inputs such as hybrid seeds, chemical fertilizer, herbicide, and pesticide. The local Farmer’s Union (FU) organizes training for new farming practices and methods and the renting of plowing and harvesting machines. Local government also supplies poor households with food and water following storms, and local communes organize working teams to help repair destroyed houses following storms. Similarly, the Women’s Union (WU) also organizes collections for female-headed households that require support in general.

This study focuses on two selected communes within Ky Anh district. Ky Hai is found in the south of the district. There are 4,373 people, divided into 1,257 households across five villages (KHC, 2020). Ky Phu is a coastal commune with 9,826 people, divided into 2,988 households across eight villages (KPC, 2018). In both communes, over eighty percent of households are characterized as ‘non-poor’ by the Vietnamese multi-dimensional poverty index.² The remaining households are characterized as ‘near-poor’ and ‘poor’. In both communes, non-farm employment is predominantly a male activity such as construction work or welding. Both communes have also experienced significant migration to urban centers in Vietnam, and South Korea, Japan, Malaysia, and the Philippines. While there are some levels of female migration, this remains a male activity. The case study examines two communes within the larger district of Ky Anh, but does not attempt to generalize findings, but rather to explain a process.

² In Vietnam, a multi-dimensional poverty index (MPI) has been implemented to capture wider elements of poverty (UNDP, 2018). The index is based on monthly income per household member and the satisfaction of five basic needs: healthcare, education, housing, water and sanitation, and information access. Each basic need has two indicators making a score out of ten in total. Under the MPI to be characterized as a ‘poor’ household if they have either (1) a monthly income of 700,000 Vietnamese Dong (VND) (\$29.90) or less, or (2) have between 700,000-1,000,000 VND (\$29.90 - 42.70) and fulfil less than three basic needs (i.e. indicator score below 3/10) (UNDP, 2018). A house is considered ‘near-poor’ if it has between 700,000-1,000,000 VND per month but can fulfil three basic needs or more (i.e. indicator score between 3-7/10). If a household has above 1,000,000 VND per month it is considered non-poor regardless of basic needs.

3. Conceptual Framework

In this chapter, the key concepts and theories are reviewed. Overall concepts surrounding gender vulnerability, gender performativity, agency, and intersectionality are combined to answer the research questions.

3.1. Gender Vulnerability and Adaptive Capacity

O'Brien et al., (2007) define two conflicting approaches to vulnerability; outcome approaches and contextual approaches. Outcome approaches locate vulnerability within the impacts of hazards, rather than the roots of differentiated vulnerability in societal structures (Bassett and Fogelman, 2013). Studies in this tradition rarely investigate the root causes of adaptive capacity, or why it is lacking (Ribot, 2014). This has been criticized as without an investigation of root causes in gender relations, it portrays women as passive and inherently vulnerable to environmental change (Arora-Jonsson, 2011), while simultaneously masking the diverse and intersectional experience of gender vulnerability (Rao, Lawson, et al., 2019; Arora-Jonsson, 2011). By shifting attention away from the role of men and the power relations that underpin vulnerability, gender analysis is downgraded to a confirmation of how women are disadvantaged by climate change (Arora-Jonsson, 2011; Djoudi et al., 2016).

Conversely, contextual approaches locate vulnerability within social, economic, and political relations (O'Brien et al., 2007; Adger, 1999). When vulnerabilities meet with hazards or stressors, they produce risk, which can exacerbate pre-existing vulnerabilities or create new ones (Basset & Fogelman, 2013). With this approach, vulnerability is understood as the current inability to cope with external changes, shocks, or stresses (O'Brien et al., 2007). With this more generalized stance, climate variability operates among many other stressors and changes that meet with pre-existing vulnerabilities within society (Ribot, 2010). Adaptive capacity relates to the ability to avoid risk and is the inverse of vulnerability; both are produced by the same social factors (Ribot, 2011).

Gender vulnerability and adaptive capacity will be used throughout this study to analyze the practices and patterns of male and female smallholder farmers concerning their experience of economic and climate-related changes. Rao, Mishra, et al. (2019, p. 964) summarizes both concepts: "Entrenched social structures create power relations that shape women's and men's experiences of vulnerability through access to resources, divisions of work, and cultural norms

around mobility and decision making, all of which determine adaptive capacity.” Resource access, divisions of labor, mobility, and decision-making are all key concepts for gender vulnerability, but more importantly, behind these concepts are power-relations and identities which are at the core root of gender vulnerability and adaptive capacity (Resurrección, 2019). To understand the relationship between gender identity and climate variability, MacGregor (2010) calls for research that goes beyond material impacts, and focuses on gender as a discursive and cultural construction of ‘masculinities’ and ‘femininities’ within the identities and power relations that shape social life. From these understandings, it is clear that in order to explore the root causes of gender vulnerability, theories relating to identity construction, intersectionality and, agency are needed.

3.2. Feminist Political Ecology

Political ecology understands the relationship between society and nature as one defined by struggles over knowledge, power, and practice (Watts, 2000). Gabrielsson and Ramasar (2013) define three key assumptions of political ecology; (1) the impacts of environmental change are unequally distributed due to pre-existing inequalities; (2) these impacts reinforce existing inequalities; and (3) that both of these combine to transform power relations between those involved. Political ecology has used these concepts to highlight that power is at the core of the reduced adaptive capacities that produce vulnerability (Adger, 1999; Engle, 2011).

Feminist Political Ecology (FPE) is a sub-field of political-ecology which views “gender as a critical variable in shaping resource access and control” (Rocheleau et al., 1996, p. 4). FPE brings the principles of political ecology to focus on how gendered rights, responsibilities, and knowledge in environmental relations produces inequalities (Elmhirst, 2015). FPE has taken these early concepts and combined them with a more recent focus on identity formation and meaning within environmental relations (Resurrección, 2017, 2019). In this way, FPE supplies guiding principles for the analysis to focus on how power relations and identities determine how men and women from various intersecting identities experience, cope, and respond to changes such as climate variability.

Additionally, FPE allows a micro-scale analysis of intra-household dynamics, and therefore displaces the perceived common interest of the household unit (Rocheleau et al., 1996). This allows an analysis of the authority structures and dynamics that can place women in a

dependent situation on male household members (Elmhirst, 2015). Therefore, agency within intra-household relations and negotiations emerges as a key element for women within male-headed households (MHH) to access important resources, while those without normative family structures such as women in female-headed households (FHH) can face gender-specific vulnerabilities in relation to such resource access (Elmhirst, 2015).

3.3. Gender Performativity

The concept of performativity can help highlight the formation of gender identity within environmental relations. Performativity is a concept introduced by Judith Butler (1990) and has gone on to become central to FPE due to its ability to show identity formation (Elmhirst, 2011). Butler (1990) held that gender is a performance, and the repetition of gendered behavior is performativity. The concept suggests that gender identity and power relations are created through the repeated performance of masculinities or femininities within everyday speech, practices, and ways of being (Butler, 1990). In simpler terms, identity is defined by what one does. Individuals are made 'gendered' through first internalizing and then re-expressing gender discourses through language and action. Discourse understands that language regulates the creation of knowledge and power, and gender discourses can be understood as a system of norms, attitudes, ideas, practices, and knowledge (Lessa, 2006), that set the limits, or the 'script', of expected behavior of men and women in a given locality. Gender is not a voluntary or conscious act as discourses surrounding practices teach and assimilate individuals into the behavior associated with their gender identity, such as how men and women should 'be' (Butler, 2004). Individuals that break with this performance of gender can face stigmatization, shaming, or violence from society (Bondi & Davidson, 2003).

Through the everyday performance of gender in farming or household practices power operates invisibly (Connell, 1995). The longer that performances are repeated, the more stable practices, identities and power-relations become (Butler, 1990, Nightingale, 2006). However, gender identities and practices are never completely stable as external forces and stresses are always destabilizing identity by creating new performances of gender and therefore changing power-relations (Watts, 2000). Such external forces can either alter or reinforce gender identities and can come in many forms such as income shocks, migration opportunities, or climate change (Djouidi & Brockhaus; Gonda, 2019; Wangui, 2014). Nightingale (2006) uses this concept to

argue that gender is a process of change in which new performances of gender emerge and changes or reinforces what it means to be ‘a man’ or ‘a woman’ in a given area. However, while there can be some common gender vulnerabilities, at the individual level agency can be used to increase adaptive capacity.

The concept of performativity will be used to explain how men and women’s identities, differences, and power are discursively constructed in language and enacted in practices on the farm and in the household; and how this produces gender structures, vulnerability, and adaptive capacity. Through this process agricultural labor and responsibilities are coded as masculine or feminine, access to resources is determined, and overall decision-making and authority are defined (Rao, Mishra, et al., 2019).

3.4. Agency

Performative adherence to gender discourses can create the practices and structural barriers that place women or men into positions of vulnerability to change or system shocks. However, at a micro-level, this vulnerability can be reduced with an individual’s agency and social relations. Kabeer’s (1999) understanding of choice revolves around the interaction between three dimensions: resources (preconditions), agency (process), and achievements (outcomes). Agency can be understood as having the power to choose and make meaningful decisions in life (Kabeer, 1999). There can be different types of agency. ‘Power to’ is the ability to make important decisions or choices for oneself. ‘Power over’ is the ability to overrule another individuals’ agency (Kabeer, 1999). The development of agency requires a certain ‘critical’ subjective identity to emerge. This is determined through a mix and interaction of gender norms, an individual’s life history, and intra-household dynamics (Kabeer, 1999).

Kandiyoti (1988) notes that the particular gender regime determines how agency emerges and ‘the rules of the game’ within gender relations. Gender structures, therefore, determine the baselines women negotiate from and how bargaining is conducted (Kandiyoti, 1988; Agarwal, 1997). The ‘patriarchal bargain’ is a concept in which women accept gender norms to avoid confrontation or household fragmentation while maximizing their benefits and decisions from within these structures. Kandiyoti (1988) characterizes South and South-East Asian gender relations as ‘classic patriarchy’ in that women strategize to externally adhere to cultural expectations and appearances of deference but engage in backstage decision-making. This is due to the weaker fall-back positions in South and South-East Asian culture due to cultural

taboos surrounding divorce or household fragmentation (Agarwal, 1997). Therefore, decision-making should also be understood as influencing, deception, and manipulation (Kabeer, 1999). Through such tactics, women can informally negotiate decisions that they do not have a formal say on (Kabeer, 1999). The preferred negotiating position is to use interpersonal strategies that ensure long-term security by manipulating their son's and husband's affections and responsibilities to them (Kandiyoti, 1988). In this way, women can call on and manipulate dominant gender or class identities and discourses to their own advantage and agency (Jackson, 1998; Seregina, 2019). Through using structures as a base for challenging authority, such as by claiming rights granted to them within conjugal obligations, gender is both reinforced and challenged at the same time (Nightingale, 2006, 2011). In this way, the acceptance of subordination within structures is the base from which agency is exercised (Eriksen et al., 2015). Kandiyoti (1988) notes that while these strategies maintain structural inequalities in place, women become skilled at increasing their well-being from inside them.

3.5. Intersectionality

Intersectionality is an analytical tool developed within feminist theory to understand how different identities and structures of power overlap and interact (Kaisjer and Kronsell, 2014). Crenshaw (1989) developed the concept to portray the varied experience of gender across other identities and social relations. Intersectionality focuses on how dynamics such as gender, age, class, ethnicity, or other inequalities overlap (Lykke, 2011). Through the interaction of various identities and categories of social difference, unique power-relations and outcomes are produced (Davis, 2008). Individuals are situated in multiple levels of social relations within the household and the community (McCall, 2005). These relations determine men and women's agency and resource access (Kawarazuka & Prain, 2019). In addition, Kaisjer and Kronsell (2014) argue that climate change research should focus on how certain intersectional positions enable or limit individual agency to contest these gender structures. In this way, the wider social relations available to a person affects their ability to adapt, cope, and respond to climate variability and other stressors (Chaplin et al., 2019). The concept can help identify the interplay of gender structures and agency. For class and gender analysis this study will avoid a material approach, but view class as social relations, status, and human capabilities (Leichenko & Silva, 2014). Similarly, age as an intersecting identity with gender can limit or enable agency. Leder and Sachs (2019) note an individual's stage within a life-cycle can determine their power in intra-household relations.

3.6. Operationalization

Vulnerability and its inverse adaptive capacity will be explored throughout in answering the three research questions (RQ) alongside guiding principles from FPE. RQ1 will use gender performativity to analyze how community-level gender identity, power relations, and adaptive capacities are created and maintained through the performance of discourses found in everyday language and practices. RQ2 will use the same concepts to focus on how gender determines men's and women's experiences of vulnerability through the adaptation and coping strategies available to them. RQ3 will employ concepts of agency and intersectionality to analyze individual or micro-level experiences of gender vulnerability and adaptation within intra-household and community-level social relations and negotiation.

4. Literature Review

This chapter identifies key themes and debates in the empirical literature related to gender vulnerability, identities and power relations within the rural livelihoods and climate variability research.

4.1. Farming Identities

Studies have shown that masculine farming identity is shaped in relation to the control of machinery, and the endurance against, and domination of nature (Brandth, 1995; Laoire, 2003). In contrast, female farming identities are constructed as frail, and unable to complete heavy, labour in order to construct masculine farming identity (Saugeres, 2002; Hitchcox, 1992). Palmer-Jones and Jackson (1997) observe that when analyzing the gender division of labor, it is important to investigate the relationship between energy intensity, technology, and skill alongside time considerations. In Bangladesh, the authors found that the introduction of treadle pumps saw men shift out of irrigation as it became perceived as unskilled and repetitive work despite the strength needed for the task. In Hai Hung province, Vietnam Hitchcox (1992) found that the perception of women as suited for unskilled work, and their tasks as ‘light’, diminished its value in the eyes of men; leaving women with more labor-intensive work. Similarly, in Phu Tho, Vietnam, Bergstedt’s (2016) findings showed that such perceptions were often in contrast to a reality in which women engaged in skilled, heavy, and dangerous farm activities despite the works’ ‘feminine’ coding. This literature highlights how gender discourses shape gender identity, the division of labor, and the valuation of male and female work.

4.2. Gender Identity, Vulnerability, and Adaptive Responses

The following studies highlight how gender identity and power relations shapes how men and women respond and cope with climate variability. Studies have found that power relations and the coding of livelihood activities as masculine or feminine have allowed men to follow adaptation and coping strategies such as occupational change or relocation, while women remain in unskilled work that allows little resources for adaptation, or activities that are particularly sensitive to climate impacts (Saptkota et al., 2016; Eriksen et al., 2005; Rao, Mishra, et al., 2019).

Access to resources such as land, labor, water, or money are key concepts within the literature (Djoudi et al., 2016; Resurrección & Huynh, 2017; Goodrich, 2019), however, time is often

missing. Reproductive responsibilities place additional burdens on women's time, leaving them more sensitive to shocks (Jost et al., 2016), such as preparing their household for disasters as found in Bangladesh (Cannon, 2002). In Thai Binh, Vietnam, it was found that gender norms allowed men free time and mobility to play cards or drink alcohol, while such norms alongside significant farming responsibilities disallow women's complacency which created barriers to attending political meetings or migrating (Ylipää et al., 2019). Power relations embedded within decision-making produces gender vulnerabilities as this can prevent women from making meaningful choices to increase adaptive capacity, such as whether to join a farmer's cooperative to access loans as found in Panchkhal, Nepal, (Sapkota et al., 2016), or the ability to make important household purchases as shown as in Thai Binh, Vietnam (Ylippaa et al., 2019).

Male migration often surfaces in gender and climate change research, however, the evidence is mixed (Djoudi & Brockhaus, 2013; Rao et al., 2020; Eriksen et al., 2005). From a review of twenty-five case studies across Asia and Africa, Rao, Mishra et al. (2019) found that male migration is leaving women with reduced leisure time and wellbeing as they have gained increased responsibilities, while their agency remains static as they remain as farm laborers. However, other reviews of the empirical literature across Asia have found that male outmigration can increase women's agency within farming decisions, but that this was often outweighed by the extra responsibilities gained from the loss of male labor (Rao et al., 2020).

4.3. Agency and Intersectionality within Rural Livelihoods

While access to resources emerges as a key factor in gender vulnerability less focus has been placed on how access is gained and adaptive capacity is improved through individual agency and intersectional social relations (Djoudi et al., 2016; Kaijser & Kronsell, 2014). In a qualitative comparative analysis of twenty-five case studies across Asia and Africa Rao, Mishra, et al. (2019) found that environmental stress is suppressing women's agency, even in households or conditions that are conducive for their employment or decision-making to emerge. For example, in Long Lang, Central Vietnam, Rydström (2020) finds that women's agency was suppressed before and during storms as men enjoy heightened power amid crises. However, masculine identities surrounding their role as 'protector' led to risk and fatality as fishermen ventured out to save boats. Similarly, in a case in Senegal, it was found that women's agency within irrigation decisions decreased as a new irrigation system became controlled by men and women lost autonomy over water choices (Nation, 2010). Studies have found that

while adaptation and coping strategies such as agricultural diversification, changing agricultural practices, and migration are securing the material survival and security of households, this can come at the cost of women's well-being, time and health (Rao et al., 2020; Solomon and Rao, 2018).

4.3.1. Age, Marital Status, and Class

Age, class, and marital status emerge from the literature as important intersections with gender for vulnerability and adaptive capacity. Within intra-household relations, women from various stages in a life cycle have different power positions and social relations. Using a life-histories approach in Western Nepal, Leder and Sachs (2019) found that the empowerment of elderly women with adequate land, powerful husbands, or wealthy sons, can disempower daughters-in-law. Such dynamics have been found to exclude daughters-in-law from agricultural training or water user groups (Leder, 2017; Leder & Sachs, 2019). Similarly, in a study of young H'mong women's lives after marriage in Northern Vietnam, Kawarazuka et al. (2019) found that daughters-in-law land into complex social positions, needing to negotiate with both their husbands and in-laws over farming and household decisions. Similarly, in Thai Binh, Vietnam it was found that young men face greater opportunities for migration while older women enjoy few opportunities outside of rice farming (Ylipää et al., 2019). The specific gender vulnerabilities and adaptive capacities of men and women change over their lifetime.

The experience of FHH often appears in the gender vulnerability literature. There has been limited studies on the agency of FHHs to respond to climate stress (Gabrielson and Ramasar, 2013), as much of the literature concerns the social isolation of such households, which leaves them with few social connections to call on during crises (Cassidy & Barnes, 2012). In a study in Ky Nam, Vietnam, Huynh and Resurrección (2014) found that FHHs receive less irrigation water into their irrigation channels as they cannot physically complete with married couples and they cannot spend as much time pumping water. However, studies have also differentiated *de facto* FHH that have male migration. In studies in Kenya and Tanzania Eriksen et al. (2005) and Below et al. (2012) found that the coping or adaptive responses to drought among FHH were restricted by time constraints, while *de facto* FHHs were able to use remittances to diversify their coping strategies significantly.

Class and gender intersect to produce unique social and power relations that are relevant for gender vulnerability and agency. Agarwal (1986) shows that Indian women from 'poorer'

households enjoy greater bargaining power than wealthier women as they are more involved in income-generating activities. Similarly, in Chhattis Mauja, Nepal it was found that ‘poorer’ women successfully manipulated gender and class discourses that paint them as impoverished and helpless to bypass and ignore water-user irrigation groups and take extra water (Zwarteveen & Neupane, 1996). Conversely, studies that focus on class materially take the opposite view. In Orissa, India higher class women coped with disasters more effectively as they had stronger houses and greater access to support networks in recovery (Ray-Bennett, 2009). Similarly, Thomas et al. (2019) found that wealthier women had more time to buy food and prepare their households for storms. Overall, the literature shows that there is not a linear relationship between high class and reduced gender vulnerability. Rather than a focus on household wealth, Jackson (1996) argues that focus should be placed on contextual transactions and transfers within the household, and that this is shaped by individual agency in intra-household bargaining.

5. Methodology

This chapter presents the research design and strategy alongside the ontological and epistemological standpoint of the researcher. A description of the research process, methods, and sampling are outlined. The chapter concludes with a discussion of the ethical considerations and limitations of the study.

5.1. Research Design and Strategy

A qualitative research strategy was chosen for its ability to provide in-depth research on male and female smallholder's everyday practice, identities, and agency alongside the social structures and norms that police them (Bryman, 2012). This strategy enables a deep understanding of the processes of gender vulnerability rather than a quantification or measurement of the phenomenon. The study also uses a feminist research strategy. This approach aims to problematize the varied experience of gender as it questions established truths and generalizations of the lives of men and women (Creswell, 2013).

To explore gender vulnerability, a case study design was used as this allows a focus on how gender vulnerability is rooted in the local norms, discourses, and power structures of a given locality (Creswell, 2013). Ky Anh is an exemplifying case as it is currently experiencing considerable climate variability, which is projected to increase significantly over the coming decades, and as it is also experiencing socio-economic change seen in agricultural and non-farm diversification, migration, and multi-local livelihood patterns (Bryman, 2012). Therefore, the case allows a rich context in order to situate this study. In this way, the unit of analysis is not the case itself, but the male and female smallholders that are found within its bounds.

5.2. Epistemological and Ontological Understandings

This thesis is guided by social constructionism and feminist epistemological and ontological perspectives. Social constructionism proposes that reality and truth are subjective to the individual as there exists no external reality outside individual understanding. In this way, meaning and culture are not stable entities but undergo continual renegotiation and construction through interaction with society (Creswell, 2013; Bryman, 2012). Feminist epistemology is incorporated which understands that an individual's understanding is based on their 'situated

knowledge’. An individual’s perception of the world is rooted in their relationships, history, and societal position (Elmhirst, 2015).

5.3. Data Collection Process

Gaining field access in Vietnam is a difficult process. I had the opportunity to go to the field as a representative from my internship organization - The International Council for Research in Agroforestry (ICRAF)- under their ongoing research project the ‘Feminization of Farming’. ICRAF maintains good relations with the provincial and district level government from past projects. This gave me access to key informants (KIs) and the local FU as guides. Two field trips to Ky Anh were completed in November 2019 (five days) and January 2020 (three days). The local FU hosted me during both trips and helped with transportation, the selection of participants, and introductions to local representatives. The first two days of the November trip were spent visiting farming systems in Ky Anh and learning about the site’s context through KI interviews. During this time a pilot interview was completed.

For translators, I sought individuals with a rural background, and I wanted both male and female translators so they could match the gender of the respondents. I was fortunate to find a professional female translator from a rural area in Ha Tinh, and a male NGO worker from a rural province in Northern Vietnam. Before leaving for Ky Anh the three of us met to discuss the interview guide and for both translators to develop a shared understanding of the interview questions.

5.4. Data Collection Methods

In keeping with the qualitative research strategy, data was collected with individual semi-structured interviews, focus group discussions, and KI interviews.

5.4.1. Sampling

As mentioned, Ky Anh was chosen as it is an exemplifying case and was easily accessible due to connections between the local government and ICRAF. Initially, the research planned to compare Ky Hai and Ky Phu communes, but after reflecting on their proximity to each other, close similarities, and representative characteristics within Ky Anh district the scale of analysis was raised to the district level.

The selection of participants for semi-structured interviews and focus group discussions was based on stratified purposeful sampling (Creswell, 2013) focused on the criteria of gender (man/woman), class (poor/near-poor/non-poor) and occupation (farmer). Men and women were chosen who were currently engaged in farming or had been in the past. Due to time limitations and logistics, it was not possible to select equal numbers across each class and gender category.

Table 1: Summary of Data Methods

Method	Description			Number
Semi-structured interviews	Women	Non-poor	8	17
		Near-Poor	3	
		Poor	6	
	Men	Non-poor	7	12
		Near-Poor	3	
		Poor	2	
Focus Group Discussions	Women (5 participants)			1
	Men (5 participants)			1
Key Informant Interviews	Commune Leaders			2
	Farmer's Union			2
	Women's Union			3

KI interviews were chosen through purposeful and convenience sampling and consisted of individuals who were involved in local government at the village and commune level. Commune leaders (2) and FU officials (2) were reached as part of the process of gaining field access. WU officials were interviewed at the commune (2) and village level (1).

5.4.2. Semi-Structured Interviews

Seventeen women were interviewed ranging in age from twenty-five to seventy-seven years old. Seven women were currently living with their husbands who were the head of their respective households. The remainder were ten FHHs, with four being *de facto* heads due to their husband's migration. Three women were single having never married. Three were widowed. Of the twelve men interviewed their ages ranged from thirty to sixty-seven years old all were currently living with their wives.³ Each interview took place in private in the

³ A more detailed profile of interview respondents can be found in Appendix A

respondents' home with the expectation that it gave respondents a sense of control and confidence in their surroundings. Interviews took between fifty to ninety minutes.

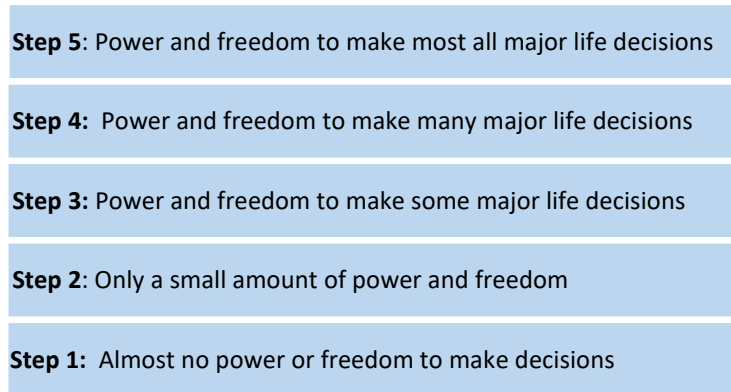
By way of introduction and to help develop some rapport and light conversation before the interview, I shared some pictures of my time working and living in Ben Tré, a rural province in the Mekong Delta region of Vietnam. The interview guide discussed daily activities on the farm and household and how these are changed by climate variability and other stressors. To encourage conversation and stimulate shy respondents to discuss the division of labor, cards representing various activities were used to (see Photo 1). The questions were open-ended to allow individuals to construct their own meaning, and for their answers to show identity construction, negotiation, and decision making (Creswell, 2013). These were accompanied with detailed follow up questions which expanded upon relevant observations of the respondents.

Photo 1. Activity Discussion Cards



To understand and discuss individual perceptions of agency and intra-household relations, a ‘ladder of power and freedom’ was used as a qualitative tool (see Figure 2) (Petesch et al., 2018). Respondents ranked and discussed with examples of their own perceived power position within the household and how they perceived this for other adult family members.

Figure 2. Ladder of Power and Freedom



Source: Petesch et al. (2018, p. 89)

5.4.3. Focus Group Discussions

Focus group discussions took place in privacy in a local government building in Ky Phu. Five men and five women took part in separate group sessions which lasted for approximately ninety minutes. The women's ages ranged from twenty-seven to sixty-three years old, while the men's ages ranged from twenty-nine to sixty-one. The female translator acted as moderator for both sessions. She took detailed notes throughout and paused after each answer to relay individual respondent's contributions to the discussion. Questions focused on livelihood challenges and coping and adaptation strategies (see Appendix C).

5.4.4. Key informant Interviews

Interviews with the commune leaders of Ky Hai and Ky Phu and FU took place in the local government offices. The interviews revolved around the challenges facing the district in terms of livelihoods, how farming systems were changing, and the specific supports the local government and FU supplied. Two interviews were carried out with the WU leaders at the commune level Ky Hai and Ky Phu, alongside a WU representative at the village level in Ky Hai. The questions asked about the work of the WU in the area and specific challenges for female farmers.

5.4.5. Additional Methods

The first two days of fieldwork involved visiting different farming systems alongside the local FU. Many more informal discussions and interviews were had with my guides during lunches

and transportation. This allowed some direct observation of the field and for detailed notes to be captured.

5.5. Data Handling and Analysis

On the advice of my internship supervisor, a social scientist with extensive experience of gender research in Vietnam, none of the interviews were audio-recorded. As respondents were being asked to share potentially sensitive intra-household dynamics it was decided that the quality of the data would be better if individuals could feel more open to speak. In a comparative analysis Rutakumwa et al. (2019) found that with rigorous note taking and a strong understanding with translators in place, the decision to record interviews should be judged against whether its inclusion will increase or reduce the overall strength of the findings. I agree with this sentiment and therefore do not consider this a limitation of the study. The pilot interview validated this decision. A strong rapport and understanding with both translators made this possible. They took notes verbatim as they were listening to participants, and I similarly wrote word-for-word their interpretation. While this slowed down the interview process, it increased the validity of the findings.

To maintain anonymity and organize the data men and women were given either a male respondent (MR) or female respondent (FR) number. Thematic analysis was used to inductively create codes which were then organized into categories (Bryman, 2012). Following a return to theory and empirical literature, the data was deductively coded again using thematic analysis. For this process, I used QDA Miner, a qualitative data analysis program. For RQ3 narrative analysis was used. Narrative analysis emphasizes individual stories rather than separating data into codes through which the meaning and context can be lost (Bryman, 2012). This approach was important to show both the diversity of experience of gender vulnerability and to show the unique and situated ways women can use agency.

5.6. Ethics and Reflexivity

As part of a feminist research strategy, a focus on ethical research methods and the power-dynamics inherent in the process was essential. The lack of audio recording was an attempt to reduce the extractive nature of the interviews and increase the respondents' comfortability (Scheyvens & Leslie, 2000). Similarly, having female translators was an important consideration to underlying power dynamics. An oral consent was received from each

respondent. They were aware of the purpose of the interview and of the confidentiality of it. Any names that are used have been changed (see Appendix B).

How research is written is a reflection of the culture, gender, class, and life history of the individual (Creswell, 2013). This thesis is a result of my own positionality as a white, male, European master's degree student which cannot be separated from this thesis, but it was something I reflected on throughout the process. Research from the 'Global North' often depicts women from the 'Global South' as marginalized and passive in the face of poverty and gender structures (Mohanty, 1988). In this way, it was important to remain self-critical when using the potentially sensitive concept of gender vulnerability and to find the diversity of its experience, and the agency and resistance within gender structures.

5.7. Limitations and Trustworthiness

The FU was an essential and unavoidable link in accessing the field. Research in Vietnam can often face challenges from local government and going through government channels is often the only option (Bonnin, 2010). However, such political gatekeepers strongly associated this research with a local government body (Hammet et al., 2014). This could have deterred respondents from openly talking about certain topics (Sultana, 2007). Similarly, at times FU officials were reluctant to select certain 'poor' households with the opinion that they would not have useful information. The male translator thought that officials were trying to avoid selecting households that may be critical about the local government. The reality of this cannot be confirmed, but it is worth mentioning.

The credibility of the study is enhanced through the rigorous methods described, alongside a triangulation of multiple sources of data (Carter et al., 2014). This study is not trying to generalize its empirical findings, but the transferability will be enhanced through the use of 'thick descriptions' about the context and findings (Bryman, 2012). To enhance the dependability, internal documents have been placed in the appendices to allow the reader to assess the methods. Similarly, by working alongside researchers within ICRAF in Vietnam, the overall validity has been improved through their input and advice.

6. Analysis and Discussion

This chapter is divided into three sections to answer the three research questions in a logical order. The following section focuses on the first research question which seeks to understand how gender identity and power are constructed out of everyday rural practices. This establishes the gender regime in Ky Anh. Following that, the discussion moves to how such gender identities and power dynamics create gender-differentiated vulnerability, adaptation, and coping to climate variability. The final section focuses on the diversity of experiences within gender vulnerability and adaptive capacity by looking at agency within intra-household relations and using an intersectional lens.

6.1. Gender Identity and Power in Everyday Practices

As gender vulnerability is a result of social relations, structures, and power (MacGregor, 2010; Eriksen, 2015), this section looks at how gender identity and power relations are constructed within the division of labor, resource access, decision-making, and mobility. By analyzing identity formation in language, and how these identities are performed and embodied in farming activities and decision-making, the overarching gender discourses can be illuminated. Through this process, the social and power relations between men and women which determine adaptive capacity can be made clear (Nightingale, 2009).

6.1.1. Gendered Farming Practices

Throughout the interviews, discourses emerged that set the social limits of men and women's capabilities and power. One respondent used an old war phrase to describe men and women's positions in marriage, she said that "the wife is the back support. The husband works at the front" (FR9). This aptly encapsulates how gender identity and power are constructed in language in Ky Anh. Found within descriptions of rural practices is a repeated mantra of 'big' and 'little' work (Bergstedt, 2016). This constructs an image of men and women's work happening in complementary harmony, while masking the power-relations embedded within this division.

The power and knowledge created and maintained by gender discourses in farming practices have given men greater adaptive capacity. Men's farming work embodies masculine ideals (Brandth, 1995). Their main responsibilities are plowing, harvesting, and spraying chemical

herbicide and pesticide. Women aid in all these activities, but they are coded as masculine. In addition, men share irrigation pumping with women. In describing these roles, different manifestations of 'big and small' can be seen in discourses surrounding strength and weakness, and skill and simplicity. Men's suitability for certain tasks is the justification for women's domestic work, "Men work harder with strenuous work. Women do things like housework." (FR1). Discourses of strength also bleed into and support norms surrounding skill and simplicity through which men are presented as having superior technical knowledge, "One person does the simple, one does the technical. I am stronger so I am best suited for it." (MR10). Men's activities also construct women's subsistence roles, "Harvesting my wife can do, but she can also do many things at home, so she stays at home" (MR9). While the biological limits of different bodies should not be ignored (Jacksen, 1998), the way these activities construct men's farming identity surrounding superior strength and skill, spill over into other spheres of activities and justifies women's work.

Traditionally in Ky Anh, plowing was completed by buffalo, and harvesting was completed by hand. However, both have been mechanized over the past five years. The local government organizes wealthier farmers to rent their machines for 150,000 VND (\$6.4) per sào (360m²). This mechanization has facilitated men's departure from farming into the non-farm economy as they can outsource their farming roles to machines and hired labor. This mechanization has widened the power gap as men's work has become less-labor intensive, and more adaptive to change, while women's activities remain static and labor-intensive.

Men and women both justify women's farming activities in terms of discourses surrounding capabilities and knowledge (Saugeres, 2002). Such gender identities are seen in sowing and planting. One woman mentioned that a man would never participate in planting or sowing as, "Women do the small work, men do not do small work." (FR16). Alongside supporting in plowing and harvesting, women are mainly responsible for planting seeds, weeding, fertilization, monitoring for disease, and maintaining rice and irrigation banks. They also dry and sell rice after harvest. These activities equate to an inequitable work burden in terms of time, energy expenditure, and mobility. This is most clearly seen in weeding. While varying with the season, on average women weeded for eighty minutes a day. Many female respondents and the female focus group observed that weeding was their most time consuming and exhausting activity. It was also quite often selected as the activity that female farmers wished to have mechanized in some way as weeding requires continual bending and stooping for long

periods in the sun. Apart from the time and labor-intensiveness of weeding, it is also used to construct the perceived capacities of men and women. Men often dismissed women's activities, "Plowing takes the most time, spraying and weeding is simple." (MR6). The perceived simplicity of women's work allowed the time and physical exertion of it to be overlooked (Hitchcox, 1992). This discourse also cements women's position as subsistence providers as one man noted, "she does weeding because I am the one who goes out to work and earn money." (MR9). The devaluation of their tasks reduces their perceived economic contribution to the household, reducing their decision-making power (Sen, 1990). Similar physical and symbolic practices are found within other repetitive or laborious tasks such as irrigation bank maintenance, and planting, among others. These embodied gendered farming practices construct women as weak, unskilled, and suitable for laborious tasks that are devalued through comparison to men's work.

Through performing internalized discourses in farming practices men and women become gendered farmers (Nightingale, 2006; Butler, 1990). Although men and women work together in complementary ways to ensure survival, these complementary practices produce unequal power relations as they create and maintain a division of labor that places women into subordinate relations to men in terms of time, labor intensiveness, and decision-making. This is in keeping with literature found in Vietnam (Bergstedt, 2015; Ylipää et al., 2019) and Asia (Palmer-Jones and Jackson, 1997; Hansda, 2017). This division devalues women's time, and in doing so their mobility is limited, leading to a reduced adaptive capacity compared to men's more mobile and mechanized farm work.

6.1.2. Practices at Home

The practices found within the household are an important arena in creating gender identity and power as they associate women with subsistence work and pile an inequitable double burden of farming and household tasks on female farmers. Men's main responsibility is repairing the house, while younger men helped more with cleaning or cooking. Women's main responsibilities are childcare, the home garden, food shopping, house cleaning, washing clothes, and caring for small animals and livestock. All respondents had gas stoves and wells for domestic use, while wealthier households had additional appliances. Even with such labor-saving machines the double burden of farm and housework significantly constrained time. Generally, most women woke one hour before their husband to prepare breakfast at around

4.30-5 am. On average, men finished work at 5.30 pm, while women often did not finish until 7.30-8 pm due to cooking and other domestic tasks. This time use is constructed as a natural and fair division due to perceptions of women's work as unskilled as one woman rationalized, "Women work longer, men work harder" (FR6). One male farmer remarked that his wife has far less free time than him, but he was entitled to it, "I am a gentleman, I need some time for smoking or tea drinking or meeting my friends outside." (MR6). This highlights the discourse that constrains women's time and allows men free time. These time constraints leave women in Ky Anh with a reduced adaptive capacity as their time becomes particularly sensitive to shocks or stresses that can increase pressure on already tight schedules (Cannon, 2002; Jost, 2016).

6.1.3. Decision-making

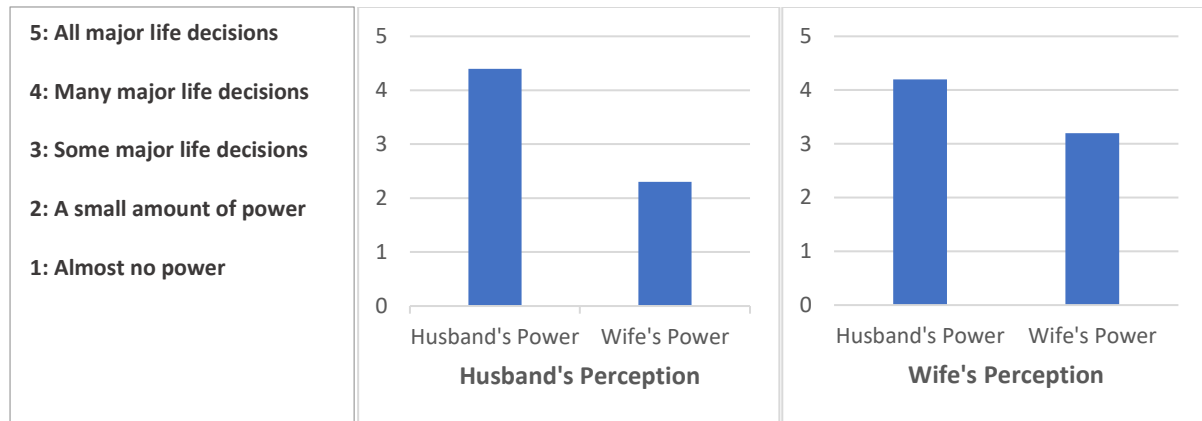
The construction of power-relations and identities are most clearly seen in decision-making. This defines who can access resources to increase adaptive capacity (Adger, 1999; Rao, Lawson, et al., 2019). But beyond access to resources, decision-making within conjugal relations can be more widely conceived as having the power to make life choices (Kabeer, 1999).

The 'Pillar of the Household' is an important Vietnamese concept which grants final decision-making and authoritative power to men. This concept refers to the conjugal contract, or the patriarchal bargain (Kandiyoti, 1988) in which men have obligations to their household in return for submission or deference. Respondents justified this power discursively through links to other masculine discourses of strength and skill, "As my husband works hard, I have to respect his decisions." (FR2). Similarly, one man justified his power as he 'has the ideas' or that he decides about purchasing household machines as, "I know the technique better, she only knows what is more beautiful." (MR8). Authority is also tied to income. One man noted, "money, money makes the decision. If you want to make a decision but have no money you can't." (MR1). These discourses give male heads of households a monopoly on most important decisions.

All respondents were asked to choose how they perceived their own and other adult household member's decision-making power on the LPF. Figure 3 shows an average of how fourteen

women and fifteen men interpreted their own, and their spouses' decision-making power within their household.

Figure 3. Results from the Ladder of Power and Freedom



This illustration (Figure 3) is not meant to quantify specific values, but only to highlight the power structure between men and women. The result shows that although husbands have greater power to make decisions, there is a gap between how husbands and wives perceive how much power wives have within the household. Women perceive that they are making more decisions than men perceive them to be. This is the space in which agency operates in unseen ways through ‘informal’ decision-making (Kabeer, 1999). When making important decisions male and female respondents always noted that they always first discuss and agree on the change. However, this was usually followed by the clarification that men will have the final say or decision. One woman mentioned that when making decisions, Vietnamese women must “know the social hierarchy” (FR1) that respects their husband’s final decision. However, *within* the discussion, women can strategize to influence or manipulate their husbands. As one woman noted, “My husband makes more decisions as he is the owner, but I make suggestions.” (FR9). Women make strategic choices of when to contest decisions as they are aware of what can be contested and what needs to go unchallenged (Kabeer, 1999; Agarwal, 1997). For example, one man noted that, “When we have different ideas for big things there is no conflict, for little things there is conflict.” (MR7). In many ways, this strategy is a form of agency.

Women reported autonomously making decisions about things considered ‘small’ such as childcare, cleaning, and small everyday purchases. They play the role of accountant for the

household budget, but do not decide large purchases. Similarly, women had greater power in their own activities such as sowing or planting, but meaningful decisions that would change farm production needed to be discussed. However, what is considered ‘small’ can vary by household with some women having more power over subsistence crops or livestock.

To conclude this section, gender identity and power relations are constructed through the performative adherence to discourses of skill, strength, and authority in everyday rural practices. This creates differentiated rights, responsibilities, and knowledge within environmental and farming relations (Rocheleau et al., 1996; Ylipää et al., 2019). The combination of these dynamics within the division of labor, resource access, decision-making, mobility, and free time, leaves female smallholder farmers with reduced adaptive capacity and define their experience of gender vulnerability and adaptation to climate variability and other stressors.

6.2. Gender Vulnerability, Adaptation and Coping to Change

Gender vulnerability is constructed as a result of social relations, structures, and power (MacGregor, 2010; Eriksen, 2015), and determines the capacity of men and women to adapt and cope with economic or climate variations (O’Brien et al., 2007). In this section, the analysis will trace these gender identities and power relations to the differential vulnerability, coping and adaptive strategies of men and women.

6.2.1. Feminization of Farming

Gender identity and power relations determine men and women’s role in household adaptation strategies. Generally, men are diversifying into the non-farm economy. Men are entering construction work, small enterprises, and both domestic and international migration. Although some young women have migrated both internationally and domestically, it is predominantly a male activity. Women’s role in household diversification is defined by their power position and identity which ties them to the household and labor-intensive agricultural activities. By contrast, women are entering into low-income activities such as vegetable trading, agricultural wage labor, small livestock, or rice-wine production.

According to KIs, over the last twenty years (1) agricultural incomes have been decreasing, (2) agricultural markets have become harder to find, (3) and increasing climate variability is impacting agriculture. These changes are in reaction to multiple stressors, not just climate variability. In this way, men entering the non-farm economy is an adaptive response to decrease the general vulnerability of the household to many types of shocks or changes (Adger, 1999; O'Brien et al., 2007). However, in Ky Anh this adaptation has caused a renegotiation of gender roles. While households with non-farm livelihoods have increased adaptive capacity, women from these households reported that they are now responsible for organizing male activities such as renting plowing and harvest machines, irrigation, spraying chemicals, and preparing their house for storms. This has increased their workloads significantly. Men's adaptive strategy has been facilitated through gender discourses surrounding income, strength, and skill. One female respondent noted that women cannot follow this strategy as 'construction workers need skills', and that women must remain in farming as 'farming activities do not bring income, they fulfil basic needs', and 'women must raise children and be close to the home' (RN26). In this way, feminine discourses surrounding skill, income, and care work regulate this change as much as masculine ideals of strength and household headship. Adaptation, therefore, is a power-laden process (Eriksen et al., 2015), completing a cycle between power and practice as pre-existing power asymmetries for female farmers are entrenched with increased responsibilities (Watts, 2000). While in Ky Anh women experience gender vulnerability due to their increased responsibilities, the literature notes that men who migrate often face dangerous informal work (Rao et al., 2020). This is beyond the scope of this study, but it is worth noting the possibilities that men experience specific vulnerabilities from this adaptation.

6.2.2. Agricultural Adaptation and Coping Strategies

This section will explore the different agricultural adaptation and coping strategies of men and women. Within farming, adaptation is taking place at the district, farm, and individual level, and men and women are following different strategies based on their relative power and positions in the division of labor.

Shifting Seasons and Schedules

Seasons and farming schedules are being impacted by climate variability; however, this is having an inequitable impact on female farmers. Increasing incidences of 'cold spells' during the autumn or winter months emerged continually as a pressing concern. In response, the

district-level government has shortened the Autumn and Winter-Spring rice season to three months to avoid such cold periods, and farmers are using hybrid rice varieties with a shorter growth period. Many women noted that this significantly reduced time spent weeding and other continual feminine activities. Men have saved time within spraying, but overall, it is a net benefit for female farmers. However, other adaptations are having the opposite effect. Due to increasingly hot summer months, many women commented that it has become common to shift their working schedule. “When it’s hot it’s hard to work. Now we cannot work at two or three, it has to be at four.” (FR3). Due to this commonly followed strategy, women reported that they are finishing their household activities later in the evening which reduces already constrained free time (Jost et al., 2016; Cannon, 2002).

Agricultural Technology

With an increased incidence of climate-related disease and pests, both men and women are adapting by increasing the frequency of pesticide and herbicide spraying. The male focus group (MFG) observed that frequent variations between hot and rainy weather is causing fungal disease in rice and peanut crops. They reported that this is happening more and more and that over the last ten years the frequency of spraying has increased from four/five to ten times per season. This has mostly impacted men’s labor but also coincides with women spending more time monitoring for disease as noted by the FFG.

In addition, in response to droughts, hot spells, and cold spells the FU is organizing agricultural training about choosing and using hybrid seeds and transplanting rice seedlings. Men and women reported that trainings are attended mostly by women as agriculture was increasingly feminized and men do not wish to go. However, in MHH women often had to receive permission from their husbands before making changes and using their training knowledge. This lack of autonomy over their own farming activities creates gender-specific vulnerabilities, as inputs are particularly important for the resilience of women’s farming activities as hybrid seeds reduce time spent on weeding and monitoring for diseases, or replanting and reirrigation after the death of seedlings from the cold.

Crop Diversification

The results show that drought is having an inequitable impact on women’s labor. Reduced rainfall and drought are leading to increased irrigation needs. With men entering the non-farm

economy, women have become increasingly responsible for irrigation. Many women noted the increased time spent maintaining irrigation channels and pumping water into them during hot spells or droughts. Acute water shortages have led to changes in land use from rice to peanut farming. FFGs observed that as peanut farming requires significantly more weeding, this change increased their workloads significantly. By contrast, men's activities in plowing, harvesting, and spraying remained relatively unchanged. Overall, household adaptive capacity has increased, but the extra workloads in response to drought are creating specific vulnerabilities for female household members.

Quite recently the Ky Anh government constructed a new mechanized irrigation system. Women are responsible for digging and maintaining the earthen channels that guide the pumped water along concrete dikes to their fields. The local government calculates how much water to release, however, both focus group discussions commented that there is rarely enough. With this system, many farmers switched back to rice cultivation for the summer crop, and the FFG confirmed that this reversed the increased weeding burdens of female farmers for peanut cultivation. However, the FFG discussed that women are competing to be the first to access the water, and that when it runs dry, some women have been stealing water from irrigation channels, or even redirecting channels into their own. It was agreed that because of this, women are now spending more time monitoring and inspecting their irrigation banks and water-levels. Research about gender and irrigation in Asia have come to similar findings about the loss of autonomy over water decisions (Nation, 2010), the competition in pumping water among women (Huynh & Resurrección, 2014), and even the agency in bypassing rules to steal water (Zwarteveen & Neupane, 1996). As noted by Nightingale (2009) gender vulnerability is a relational process that emerges in specific contexts. The irrigation project reduced gender vulnerability as it allowed a shift back to less-labor intensive rice farming, while in other instances it has inadvertently created new forms of gendered time constraints, risk, and even agency through the practice of monitoring and potentially stealing water.

Coping Strategies

While these adaptations are to an extent mitigating agricultural losses and damages, they have not been completely effective. Generally, compared to men, women face greater increases in responsibilities and working time to cope with climate variability. Although herbicides have reduced weeding, increased variations in heavy rainfall is removing herbicide after application,

and in some cases, women perceive their time spent weeding is increasing as a result. Despite cold and flood-resistant rice seeds and shifting to shorter seasons, many female respondents reported that cold spells and storms are flooding and killing newly planted rice seedlings. This requires replowing, replanting, respraying and reirrigating, which has greater impacts on women as they fulfil the more labor-intensive activities, while the male activity of plowing is mechanized.

Similarly, increased and unpredictable rainfall is having time and labor impacts. Men's activities remain relatively insulated from the heavy rainfall experienced in Ky Anh. However, many women reported the impact heavy rainfall is having on their home gardens. This is an important source of non-farm income for women. Increasingly frequent rainfall is leading to extra labor spent in draining home gardens, and replanting vegetables. In addition, after harvest, the rice crop must dry outside before processing. This activity is increasingly difficult as rainfall patterns are unpredictable as they no longer follow the season and change rapidly. One woman bemoaned that this is becoming an exhausting activity, "Sometimes it rains suddenly, and I have to leave my food. I want to go somewhere but I worry it might rain." (FR9). Other FR noted that their time and labor is increased as they must quickly haul rice undercover or raise it above ground. As observed, this is reducing women's mobility as they must stay near their house, reducing their time for other activities or opportunities.

To conclude this section, at the root of the gender-differentiated vulnerability and impacts are the gender identities and power relationship that underpins mobility and the division of labor. Men's greater mobility and power has allowed them to adapt by entering the non-farm economy, which is leaving women with extra farm responsibilities. This agrees with the wider literature (Sapkota et al., 2016; Eriksen et al., 2005), that pre-existing gender vulnerabilities determine adaptive responses. Environmental change transforms power relations (Watts, 2000), but adaptation to economic and climate changes in Ky Anh is not presenting an opportunity to 'undo' gender identities (Kabeer, 2004; Jerneck 2018), but is reinforcing pre-existing vulnerabilities found in discourses of strength, skill, and men's authority as women must increasingly perform unskilled and labor-intensive activities in their adaptive and coping actions. Through these inequitable impacts, women's time and mobility are further constrained (Resurrección, 2012; Gonda, 2016), which creates new constraints on adaptive capacity.

So far, gender has been treated in a structural manner. However, the experience of vulnerability and adaptation is a highly individual process due to the intersection of gender with other power relationships. The following section will dive into the micro-level experiences of vulnerabilities, coping and adaptation, and the power relations within these processes.

6.3. Agency and Intersectionality within Gender Vulnerability and Adaptation

Kabeer's (1998) understanding of agency in combination with intersectional perspectives are pertinent in analyzing how an individual's social relations and positions can create both unique gender vulnerabilities and responses to it. How an individual is placed in relation to structures in the household and community determines their ability to exercise agency and access resources in responding to gender vulnerability (Kabeer 1998). As noted by Kabeer (2000) in patriarchal systems women avoid confrontation through informal bargaining and manipulation. The first section will analyze intra-household bargaining and intersecting relations of gender, class, and age within MHH. The LPF will be referenced throughout and it can be found on page 35. The second section will analyze the unique gender vulnerabilities and responses of FHH.

6.3.1. Intra-Household Relations

The following two cases can highlight how female farmers have agency to make choices through 'backstage' and informal negotiation (Kabeer, 1999). Female farmers can claim knowledge from their roles to influence decision-making and reduce vulnerability. Nguyen, 40, is a rice and peanut farmer from a 'near-poor' household. He describes his own activities as technical farming, and his wife Ngọc's as simple or "little work", despite acknowledging she is constantly busy with farming or housework. Nguyen notes that his wife can buy agricultural inputs such as cold-resistant seeds without consulting him because she attends training and is skilled at calculating the amounts required. He says that in their household, Ngọc plays the role of bookkeeper as she knows best their income and expenditure and 'what is needed'. On the LPF he places himself at four and Ngọc at three. Nguyen recounts that he recently decided to buy a plowing machine, but that Ngọc protested by pointing to their overall expenses. She argued that they had no collateral for a bank loan and that a plowing machine was unaffordable, but then suggested that a washing machine was not. Eventually, Nguyen conceded but insisted on choosing it as the details are "too confusing for her". In this case,

Ngọc used her role as bookkeeper to successfully argue her case. By using her gender role this way she avoided direct confrontation, and her husbands' position remains unchallenged (Kabeer, 1999; Kandiyoti, 1988). Ngọc's agency has reduced her vulnerability as she can use limited household resources to mechanize her own activities rather than her husbands', increasing her adaptive capacity as her time is more insulated from shocks. In other cases, women similarly mentioned using their role of 'accountant' to influence their husband's decision such as delaying purchases until after harvest or arguing against what they thought was unnecessary purchases such as a large television. In this way, women can slowly expand autonomy from within their roles (Kawarazuka & Prain, 2019).

Hang, 77, is a retired rice-farmer from a 'poor-household'. Two years ago, she suggested to her husband that they rent out their land as they were too old to use it. Initially, her husband disagreed but she stressed and persisted that they should not have to borrow things from relatives and neighbors as they often do. She repeated that it was a shame on their household that they borrowed and had little income. Eventually, he agreed. In this way, Hang is strategically manipulating an intersection of her husband's gender and class identity. She made him reflect on their material circumstances and his obligations to her as 'the pillar of the household' within the 'patriarchal bargain' (Kandiyoti, 1988). However, while she has agency in this regard, in other domains her husband's agency can dominate (Kabeer, 1999). Before a storm in 2017, Hang's husband refused to evacuate to their son's secure house. Hang recounts that he said, "if he is going to die, he will die here in this house" (FR11). During the storm, their roof was destroyed, and they made the dangerous journey down the road to their son's house. Gender vulnerability is an evolving process as different manifestations of vulnerability emerge contextually (Nightingale, 2009). In this case, Hang has agency to influence her husband when there is time to reason with him. In securing rental income, she reduced her vulnerability by actively securing herself from future shocks. However, during crises such as storms the power-relations between Hang and her husband shift, and her lack of ability to make decisions increases her exposure to life-threatening situations. This is in line with evidence that environmental stress is reducing women's agency (Rao, Mishra, et al., 2019). This case is also in line with Rydström's (2020) finding in Vietnam that men gain power during storms, and that masculine identities can place men in danger, however, Hang's husbands' decision placed them both at risk.

These two cases highlight how women can develop and use agency through manipulating gender structures and discourses to use ‘informal’ decision-making, argue their case, and ‘choose’ (Kabeer, 1998). The importance of this ability goes beyond material gains as it reflects the power-relations within decision-making which is a decisive factor in the production of gender vulnerability.

6.3.2. Vulnerability Across Life Cycles

The responsibilities, opportunities, power, and agency available to women and men change over their lifetime (Leder & Sachs, 2019; Kawarazuka et al., 2019). Younger men, and in some cases younger women had greater opportunities to leave farming due to their youth, while middle-aged and older men were more centered in agriculture. This is in keeping with findings from other provinces in Vietnam (Ylipää et al., 2019; Bergstedt, 2016). However, the responsibilities of women change over their lifetime. Young women often placed childcare as their most time-consuming activity, while older women noted that they were helped by adult children or in-laws in farming and household work. In addition, older men and women could often rely on family remittances and support networks. Both focus groups noted that having children was important for older populations during storms as it gave them a place of shelter. In this way, being an older woman did not necessarily equate to increased gender vulnerability, but often depended on motherhood and marital status.

In some ways, older women held distinct advantages in terms of adaptive capacity. Mother-in-laws hold significant power as matriarchs and their presence can complicate intra-household dynamics and social relations through creating another realm of negotiation for ‘choice’. Thuy, 25, is the youngest woman interviewed. She is from a ‘non-poor’ household with large landholdings. She lives with her husband, a local welder, her three children, and her mother-in-law who owns the land and house. Alongside her domestic tasks, Thuy is responsible for rice, maize, peanuts, sweet potato, home garden vegetables, pigs, chickens, and ducks. However, despite a heavy mandate of tasks, she remains a laborer and not a decision-maker in the household. Her mother-in-law has been able to mostly withdraw from farm work as Thuy now supplies the main labor force. On the LPF she ranks herself at two, and husband and mother-in-law at four and five. Thuy makes decisions about childcare and cleaning but explains that her mother-in-law makes farm decisions as it is her land. Her father-in-law died two years ago, he would make all final decisions and Thuy was reluctant to ask for anything. Despite

attending agricultural training, her mother-in-law tells Thuy which seeds to buy. In one instance Thuy wanted to buy a rice cooker. She knew she first must convince her husband, and only after this approval did, she approach her mother-in-law. Kabeer (1999) notes that both resources and agency are needed to make meaningful choices. Thuy comes from a wealthy household, but specific household dynamics and transactions reduce her power to access resources and make choices (Jackson, 1996). Her time is stretched thin, and she cannot make decisions about her own labor or use her knowledge from training. However, she is learning to strategically negotiate, and feels more confident to make requests than when her father-in-law was alive (Kawarazuka et al., 2019). In this way, younger women in Ky Anh can experience reduced adaptive capacities in relation to their age and household position as their ability to access resources and make decisions are reduced (Leder & Sachs, 2019).

6.3.3. Class and Gender

As noted in the literature review, there is inconclusive evidence that higher class or wealth reduces gender vulnerability to system shocks or stresses such as climate variability. The ‘feminization of farming’ discussed in section two is mostly affecting ‘non-poor’ or wealthier ‘near-poor’ households that can secure construction jobs or afford the initial investment of migration. In these households, women take on extra labor in irrigation and spraying among others (Rao, Mishra, et al., 2019). However, in ‘poor’ or ‘near-poor’ households there were more shared activities between men and women such as irrigation and fertilizing, while men sometimes lent labor to weeding. Similarly, men in such non-diversified households remain completely responsible for spraying chemicals due to concerns for women’s reproductive health. In this way, the ‘feminization of farming’ is particularly affecting wealthier women’s labor time and leaving them at greater exposure to climate variability than other women.

Also, the literature notes that it is women’s control of assets and perceived income contributions that shape their power within intra-household relations rather than how wealthy their household is (Sen, 1990; Solomon & Rao, 2018). In wealthier diversified households in Ky Anh, rice cultivation often returned to a subsistence base. This separates women’s labor from income-generating activities and further devalues their contribution, which can reduce their decision-making. However, in ‘poorer’ households almost entirely reliant on agriculture, women’s labor has a higher valuation due to its greater importance and contribution to the household. One male respondent from such a household noted that while his wife can contest decisions because he is just a farmer, in other households it is different. He notes that

“In other households, the husband is at the fifth level (of the LPF) because other households do not work in the farm sector. He has ten million, he has thirty million, he goes abroad and gets one hundred million. When he returns he decides to build a big house, and his wife can’t say anything.” (MR2)

This is in keeping with Sen (1990) and Agarwal’s (1986) findings about women, class, and bargaining power. Increased decision-making is not tied to overall household wealth, but to specific household dynamics such as whose work is increasing household wealth (Jackson, 1996).

6.3.4. Female-Headed Households

This section will explore the different experiences of FHHs in terms of gender vulnerability and adaptation.

Phuong, 73, has been a widow for five years. In the past, she relied on a small income from pigs and chickens, but they died in a drought in 2016. The following year a storm destroyed her roof and many of her belongings. In response, she started making rice-wine. For this she needs firewood so she has organized two traders to come to her twice a week to sell her some, and she also collects what she cannot buy. Last year she sold part of her unused farmland and combined this income with remittances from her daughter in South Korea to build a new concrete house. Although Phuong has been impacted by climate variability and faces specific vulnerabilities due to her age, her wider social relations and family network has given her resources and agency to build adaptive capacity with this small enterprise. While women within MHHs can negotiate with their husbands to access resources, for FHH such small income-making activities and support from wider intergenerational family networks were often the most important factor in determining their relative vulnerability or adaptive capacity.

However, unmarried female heads of households with young children can face unique vulnerabilities due to stigmatization and as without other adult household members, their time and resources are stretched. Ngan, 42, is from a ‘poor’ household. She has never been married and lives with her fourteen-year-old son. To diversify her income, she has an enterprise selling vegetables in the local market. Ngan says many people support her by buying her vegetables, however, beyond this, she does not have many social connections in the community. She also sometimes works as an agricultural laborer. However, her diversification activities have impacted her time significantly. In order to sell vegetables in the market she wakes an hour

early at 4.30 am. Similarly, she also must go back outside after dinner at 7 pm to buy vegetables from other women to sell in the morning market. She then returns home to do housework before heading to bed at 10 pm. Ngan says that she is constantly busy and does not have time to go to agricultural training. She wishes that someone from the FU could come help her with this. Ngan is actively diversifying her household with her vegetable enterprise and wage labor, but her combined responsibilities are reducing her wellbeing and pushing her into 'time poverty'. As found by Rao et al. (2020), while coping strategies can maintain material survival, they can come at the cost of women's wellbeing and agency. These time constraints create specific vulnerabilities as she cannot access important information from training such as methods to protect her rice crop or seedlings from cold spells, and her livelihood remains highly sensitive to further stresses on her time.

Like Hang, Ngan also mentions that that storms have taken off and damaged her roof. 'Poor' households are often made from weak materials and are not built on higher concrete blocks like wealthier households. Because of this such households often face significant damage from storms and the floods that follow them. Men's storm recovery roles involve repairing the household structure, however, FFG noted that women face greater burdens due to the combination of recovery work and their domestic activities. Women from 'poor' households whose roofs were destroyed from storms noted the time taken in cleaning the house and drying out household objects after the storm. As appliances such as gas cookers are often damaged from storms, they spend extra labor collecting firewood and cooking meals until they can replace it. Conversely, wealthier women in concrete households have little preparation or recovery work for storms.

However, FHHs can face specific gender vulnerabilities during storms. FFGs mentioned that FHH households often do not have time or the labor to prepare for storms or stock provisions. Ngan mentioned that she feels particularly vulnerable as she cannot prepare her house like other households in which men weigh down the roof with heavy objects. KIs noted that there is a storm recovery team that checks on households considered vulnerable. However, respondents from FHH raised the point that this is only after a storm, and not before when labor is needed to prepare. While some FHHs have family networks or neighbors to help them. Ngan and other unmarried women either lived alone, or with their elderly parents and did not have the time or social connections to help them prepare their house.

However, women who were *de facto* FHH due to male out-migration had a very different experience of vulnerability and adaptation. In some cases, in Ky Anh, migration has allowed agency to emerge despite the increased responsibilities this leaves for women. Thu, 43, is from a ‘non-poor’ household. Her husband is a long-term migrant, he is currently in South Korea. On the LPF she places herself at 3 and her husband at 4, “We both have power, but I am a bit lower, I have to respect his decisions. But sometimes if I feel that we do not have enough money, I can convince him.” (FR9). Similarly, for large investments or purchases she can convince her husband. “I will try to convince him. It takes time. Slowly slowly. My husband is higher in the household, I have to respect it.” She believes that her husband’s migration has given her more power, ‘When he is at home, he makes the final decisions. Now I make decisions’. Thu convinced her husband that they should begin growing fruit trees. She observes the extra irrigation labor this creates, but the income she gets from fruit trees is high. Thu believes that through gaining income her decision-making has increased significantly since when she was first married:

“I have more power now... More than when I was just married. I was shy and couldn’t make decisions. Now I have money I can decide this or that. It is mostly the economic situation. There is more money than when we were first married.” (FR9).

Through both the resources from migration and her ability to convince her husband, Thu was able to choose to grow fruit trees (Kabeer, 1999). She believes that this has given her further decision-making power as now she ‘has money’ and controls this asset (Sen, 1990). Likewise, at 43 years old, she has become more confident and skilled at negotiating with her husband than earlier in her marriage (Kandiyoti, 1988). As such, her agency and diversification have increased her decision-making and adaptive capacity, and are situated in factors surrounding age, class, household structure, and migration. Thu’s case exemplifies the experience of many other *de facto* female household heads. While many women observed like Thu, that some of this power recedes when their husbands’ return, they said the feeling of confidence remains.

The cases show that women are skilled at negotiating access to resources such as rents, household machines, or the ability to make important farming decisions, all of which can reduce gender vulnerability and improve adaptive capacity. These cases have also shown how age, class, intersect with gender to create specific vulnerabilities, power relations and social positions that either foster or reduce agency and adaptive capacity (Djoudi et al., 2016). These intersections are made further complex when mixed with different household structures,

motherhood, marital status, and wider family networks. In all these instances agency and vulnerability were determined by a specific mix of these ‘ingredients’ which shaped individuals’ social relationships within their household and communities (Kawarazuka et al., 2019). The cases show that higher-class allows greater storm resilience due to their stronger houses (Ray-Bennett, 2009, Thomas et al., 2019), while FHHs face labor shortage in preparing for storms. However, the findings also highlight that the ability of women to access resources is not defined by class but is shaped by agency, social relations, and their perceived wealth contribution (Jackson, 1996; Agarwal, 1986). Furthermore, for FHHs material survival can come at the cost of women’s time and well-being, which leaves little space to adapt to future shocks (Rao et al., 2020). Additionally, while the literature shows conflicting evidence about migration and gender vulnerability (Rao, Mishra, et al., 2019; Djoudi et al., 2016), in Ky Anh this male adaptation strategy is allowing the possibility of agency to emerge despite increased farming responsibilities.

7. Conclusion

Using gender analysis, this case study explored the lives and practices of men and women living and farming in Ky Anh district. The study aimed to understand the role of gender identity and agency within the production of vulnerability and adaptive responses to change in Ky Anh district.

In answering RQ1 the results showed that gender identity and power is constructed through the performance of gender discourses surrounding strength, skill, and authority, in language and practices on the farming and in the household. This construction of gender identity and power devalues women's time and gives men a monopoly of household decision making. This results in gender-differentiated rights, responsibilities, and adaptive capacities within mobility, decision-making, resource access, and the division of labor.

RQ2 analyzed how these gender identities and power relations define men and women's adaptive strategies and experiences of gender vulnerability. The results showed that in response to both economic and climate stressors men's higher adaptive capacity have allowed them to diversify into the non-farm economy and migration, while women's relative vulnerability marks their diversification into low-income activities. The findings showed that in Ky Anh pre-existing gender vulnerabilities are being reinforced through adaptation and coping strategies that negatively impact women's time and mobility. The findings showed that men's adaptation contributes to the feminization of farming, increasing women's agricultural responsibilities. Although both men and women are actively adapting and coping with climate variability, women's farming activities face larger impacts due to their greater responsibilities and the labor-intensiveness of their work.

However, with a focus on intra-household relations and intersectionality, the findings from RQ3 show that there is a more complex story of gender vulnerability within Ky Anh. While facing some common vulnerabilities, women were found to creatively and strategically use agency within 'informal decision-making' to manipulate and bargain with gender structures (Kabeer, 1999). Through this, women can expand their choices in order to access resources and increase their individual adaptive capacity to multiple stressors (Kabeer, 1999). Age and class emerged as important intersections with gender. The results showed that being an older or younger woman, or of a higher or lower class, does not necessarily equate to higher or lower gender vulnerability, but it showed how gender vulnerability emerges in different contexts as

varied opportunities and constraints emerged. Nevertheless, older women often had greater agency within the household due to higher social positions and more years of experience of household negotiation. The findings show that FHHs had a wide range of experiences of vulnerability and adaptation, with a greater importance placed on the presence of children and wider family networks.

7.1. Research Implications

The study has highlighted the importance of gender vulnerability approaches that focus on social relations. It is important to build on this evidence as the wider literature continues to focus on the biophysical impacts of vulnerability rather than its origin in social relations.

Furthermore, this study highlights that engagement with feminist theory that focuses on gender identity can help explore how men and women's vulnerabilities are constructed in everyday power relations and practices. Any attempt at adaptation that does not aim to transform core gender-relations will continue to enforce discourses that contribute to gender inequalities.

This study has contributed to the growing, but still underrepresented, intersectional literature on gender and climate change. The results show that there exists a wide range of experiences of gender vulnerability and that for the formulation of policies and projects that can effectively target the diverse needs of various men and women, greater engagement with the intersectional experience of gender within climate change is needed. Similarly, the findings highlight that vulnerability approaches must focus on both gender structures and agency - both society and the individual (Jerneck, 2018). Agency is often missing, but without its consideration women will be incorrectly portrayed as passive victims of change. This study has therefore shone a light on how women use agency strategically, and in unseen ways to work on the cracks and gaps within gender structures and slowly chip away at their foundation. To conclude, it is important to reflect on the fact that while certain individuals or social groups may be victims of environmental change, that does not mean they are passive. In reality, they are actively engaging with and contesting such changes. This distinction is a meaningful one.

References

- Adger, N. W. (1999). Social vulnerability to climate change and extremes in coastal Vietnam. *World Development*, 27(2), 249–269. [https://doi.org/10.1016/S0305-750X\(98\)00136-3](https://doi.org/10.1016/S0305-750X(98)00136-3)
- Agarwal, B. (1986). Women, Poverty and Agricultural Growth in India. *The Journal of Peasant Studies*, 13(4), 165-220. <https://doi.org/10.1080/03066158608438309>
- Agarwal, B. (1997). “Bargaining” and gender relations: Within and beyond the household. *Feminist Economics*, 3(1), 1-51. <https://doi.org/10.1080/135457097338799>
- Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender and climate change, 21(2), 744-751. *Global Environmental Change*. <https://doi.org/10.1016/j.gloenvcha.2011.01.005>
- Bassett, T. J., & Fogelman, C. (2013). Déjà vu or something new? The adaptation concept in the climate change literature, *Geoforum*, 48, 42-53. <https://doi.org/10.1016/j.geoforum.2013.04.010>
- Below, T. B., Mutabazi, K. D., Kirschke, D., Franke, C., Sieber, S., Siebert, R., & Tscherning, K. (2012). Can farmers’ adaptation to climate change be explained by socio-economic household-level variables? *Global Environmental Change*, 22(1), 223-235. <https://doi.org/10.1016/j.gloenvcha.2011.11.012>
- Bergstedt, C. (2016). *Cultivating Gender: Meanings of Place and Work in Rural Vietnam*. NIAS Press.
- Bondi, L., & Davidson, J. (2003). Troubling the place of gender. In K. Anderson (Ed), *Handbook of Cultural Geography*, London: SAGE, 325-343. <https://doi.org/10.4135/9781848608252.n23>
- Bonnin, C. (2010). Navigating fieldwork politics, practicalities and ethics in the upland borderlands of northern Vietnam. *Asia Pacific Viewpoint*, 51(2), 179-192. <https://doi.org/10.1111/j.1467-8373.2010.01423.x>
- Brandth, B. (1995). Rural masculinity in transition: Gender images in tractor advertisements. *Journal of Rural Studies*. 11(2), 123-133. [https://doi.org/10.1016/0743-0167\(95\)00007-A](https://doi.org/10.1016/0743-0167(95)00007-A)
- Bryman, A. (2012). *Social research methods* Bryman. *OXFORD University Press*. <https://doi.org/10.1017/CBO9781107415324.004>
- Butler, J. (1990). *Gender trouble and the subversion of identity*. New York et Londres: Routledge.
- Butler, J. (2004). *Undoing gender*. New York: Routledge
- Cannon, T. (2002). Gender and climate hazards in Bangladesh. *Gender and Development*. 10(2), 5-50. <https://doi.org/10.1080/13552070215906>

- Carter, N., Bryant-Lukosius, D., Dicenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*, 41(5), 545-7. <https://doi.org/10.1188/14.ONF.545-547>
- Chaplin, D., Twigg, J., & Lovell, E. (2019). *Intersectional approaches to vulnerability reduction and resilience-building*. <https://www.odi.org/sites/odi.org.uk/files/resource-documents/12651.pdf>
- Connell, R.W., (1995), *Masculinities*. Cambridge, UK: Polity Press
- Christoplos, I., Ngoan, L. D., Sen, L. T. H., Huong, N. T. T., & Nguyen, H. (2017). Changing arenas for agricultural climate change adaptation in Vietnam, 27(2), 132-142. *Development in Practice*. <https://doi.org/10.1080/09614524.2017.1285272>
- Creswell, J. W. (2013). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (3rd Edition). Thousand Oaks: SAGE Publication.
- Dasgupta, S. (2019). Gender-Based Vulnerabilities and Adaptation to a Changing A Case Study in Tra Hat Village, Bac Lieu Province, Vietnam. In T. R. Paris & M. F. Rola-Rubzen (Eds.), *Gender Dimension of Climate Change Research in Agriculture, Case Studies in Southeast Asia*. Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), College, Los Baños, 11-34.
- Davis, K. (2008). Intersectionality as buzzword: A sociology of science perspective on what makes a feminist theory successful. 9(1), 67-85. *Feminist Theory*. <https://doi.org/10.1177/1464700108086364>
- Desai, J. (2001). *Vietnam through the Lens of Gender: Five Years Later*. Hanoi, Food and Agriculture Organization of the United Nations. [online]. Available at: <file:///C:/Users/Eoin/Downloads/Vietnamthroughthelensofgender5yearslater.pdf>. [Accessed 3 Apr. 2020]
- Djoudi, H., & Brockhaus, M. (2011). Is adaptation to climate change gender neutral? Lessons from communities dependent on livestock and forests in northern Mali, 13(2), 123–135. *International Forestry Review*. <https://doi.org/10.1505/146554811797406606>
- Djoudi, Houria, Brockhaus, M., & Locatelli, B. (2013). Once there was a lake: Vulnerability to environmental changes in northern Mali. *Regional Environmental Change*, 13(3), 493–508. <https://doi.org/10.1007/s10113-011-0262-5>
- Djoudi, Houria, Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Basnett Sijapati, B. (2016). Beyond dichotomies: Gender and intersecting inequalities in climate change studies. *Ambio*, 45(3), 248–S262. <https://doi.org/10.1007/s13280-016-0825-2>
- Elmhirst, R. (2011). Introducing new feminist political ecologies. *Geoforum*, 42(2), 129-132. <https://doi.org/10.1016/j.geoforum.2011.01.006>
- Elmhirst, R. (2015). Feminist political ecology. In A. Coles, L. Gray, J. Momsen (Eds.), *The Routledge Handbook of Gender and Development*, London: Routledge, 519-530. <https://doi.org/10.4324/9780203383117>

- Engle, N. L. (2011). Adaptive capacity and its assessment. *Global Environmental Change*, 21(2), 647-656. <https://doi.org/10.1016/j.gloenvcha.2011.01.019>
- Eriksen, S. H., Brown, K., & Kelly, P. M. (2005). The dynamics of vulnerability: Locating coping strategies in Kenya and Tanzania. *Geographical Journal*, 71(4), 287-305. <https://doi.org/10.1111/j.1475-4959.2005.00174.x>
- Eriksen, S. H., Nightingale, A. J., & Eakin, H. (2015). Reframing adaptation: The political nature of climate change adaptation. *Global Environmental Change*, 35, 523-533. <https://doi.org/10.1016/j.gloenvcha.2015.09.014>
- Fortier, F. (2010). Taking a climate chance: A procedural critique of Vietnam's climate change strategy. *Asia Pacific Viewpoint*, 51(3):229-47 <https://doi.org/10.1111/j.1467-8373.2010.01428.x>
- Gabrielsson, S., & Ramasar, V. (2013). Widows: Agents of change in a climate of water uncertainty. *Journal of Cleaner Production*, 60, 34-42. <https://doi.org/10.1016/j.jclepro.2012.01.034>
- Gonda, N. (2019). Re-politicizing the gender and climate change debate: The potential of feminist political ecology to engage with power in action in adaptation policies and projects in Nicaragua. 106, 86-96 *Geoforum*. <https://doi.org/10.1016/j.geoforum.2019.07.020>
- Gonda, Noémi. (2016). Climate Change, "Technology" and Gender: "Adapting Women" to Climate Change with Cooking Stoves and Water Reservoirs. *Gender, Technology and Development*, 20(2), 149-168 <https://doi.org/10.1177/0971852416639786>
- Gonda, Noemi. (2017). Rural masculinities in Tension: Barriers to Climate Change Adaptation in Nicaragua. *Transformations in Environment and Society*, 4, 69-76. <https://doi.org/doi.org/10.5282/rcc/7977>
- Goodkind, D. (1995). Rising gender inequality in Vietnam since reunification. *Pacific Affairs*, 68 (3): 342-59. <https://doi.org/10.2307/2761129>
- Goodrich, C. G., Udas, P. B., & Larrington-Spencer, H. (2019). Conceptualizing gendered vulnerability to climate change in the Hindu Kush Himalaya: Contextual conditions and drivers of change. *Environmental Development*, 31, 9-18. <https://doi.org/10.1016/j.envdev.2018.11.003>
- General Statistics Office (GSO) (2018). *Poverty rate by province*. (online) General Statistics Office of Vietnam [online]. Available at: https://www.gso.gov.vn/default_en.aspx?tabid=783 [Accessed 20 Apr. 2020]
- Hammett, D., Twyman, C., & Graham, M. (2014). *Research and fieldwork in Development*, Abingdon: Routledge
- Hanh, H. Q., Azadi, H., Dogot, T., Ton, V. D., & Lebailly, P. (2017). Dynamics of Agrarian Systems and Land Use Change in North Vietnam. *Land Degradation and Development*, 28, 799-810. <https://doi.org/10.1002/ldr.2609>

- Hitchcox, L. (1992). A water programme in Vietnam and its impact on women. *Development in Practice*, 2(2), 23–36. <https://doi.org/10.1080/096145249100076521>
- Huynh, P. T. A., & Resurreccion, B. P. (2014). Women’s differentiated vulnerability and adaptations to climate-related agricultural water scarcity in rural Central Vietnam. *Climate and Development*, 6(3), 226-237. <https://doi.org/10.1080/17565529.2014.886989>
- IPCC. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Summary for Policymakers. In *Climate Change 2014: Impacts, Adaptation and Vulnerability - Contributions of the Working Group II to the Fifth Assessment Report*. <https://doi.org/10.1016/j.renene.2009.11.012>
- Jackson, C. (1996). Rescuing Gender from the Poverty Trap. *World Development*, 24(3), 489–504. [https://doi.org/10.1016/0305-750X\(95\)00150-B](https://doi.org/10.1016/0305-750X(95)00150-B)
- Jackson, C. (1998). Gender, irrigation, and environment: Arguing for agency. *Agriculture and Human Values*, 15, 313–324. <https://doi.org/10.1023/A:1007528817346>
- Jacobs, S. (2008). Doi Moi and Its Discontents: Gender, Liberalisation, and Decollectivisation in Rural Viet Nam. *Journal of Workplace Rights*, 13 (1),17–39. <https://doi.org/10.2190/wr.13.1.c>
- Jerneck, A. (2018). Taking gender seriously in climate change adaptation and sustainability science research: Views from feminist debates and sub-saharan small-scale agriculture. *Sustainability Science*, 13(2), 403–416. <https://doi.org/10.1007/s11625-017-0464-y>
- Jost, C., Kyazze, F., Naab, J., Neelormi, S., Kinyangi, J., Zougmore, R., Aggarwal, P., Bhatta, G., Chaudhury, M., Tapio-Bistrom, M. L., Nelson, S., & Kristjanson, P. (2016). Understanding gender dimensions of agriculture and climate change in smallholder farming communities. *Climate and Development*, 8(2), 133-144. <https://doi.org/10.1080/17565529.2015.1050978>
- Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women’s empowerment. *Development and Change*, 30, 435-464. <https://doi.org/10.1111/1467-7660.00125>
- Kabeer, N. (2000). *The Power to Choose: Bangladeshi Women and Labour Market Decisions in London and Dhaka*. Verso Books: London.
- Kaijser, A., & Kronsell, A. (2014). Climate change through the lens of intersectionality. *Environmental Politics*, 23(3), 417-433. <https://doi.org/10.1080/09644016.2013.835203>
- Kandiyoti, D. (1988). Bargaining with patriarchy. *Gender & Society*. 2(3), 274-290. <https://doi.org/10.1177/089124388002003004>
- Kawarazuka, N., & Prain, G. (2019). Gendered processes of agricultural innovation in the Northern uplands of Vietnam. *International Journal of Gender and Entrepreneurship*, 11(3), 210-226. <https://doi.org/10.1108/IJGE-04-2019-0087>

- Kawarazuka, N., van Anh, N. T., Thai, V. X., & Thuong, P. H. (2019). "A Bird Locked in a Cage." In C.A. Sachs, *Gender, Agriculture and Agrarian Transformations*, <https://doi.org/10.4324/9780429427381-7>
- Ky Anh Government (KAG) (2019). *Summary of the Population and Housing Census 2019*. [online] Available at: <http://kyanh.hatinh.gov.vn/kyanh/portal/read/thong-tin-thong-ke/news/bao-cao-tong-ket-cong-tac-tong-ieu-tra-dan-so-va-nha-o-nam-2019.html/20191210165349>. [Accessed 10 May 2020]
- Ky Hai Commune (KHC). (2020). *Features of Ky Hai Commune station*. [online] Available at: <http://xakyhai.hatinh.gov.vn/lich-su-hinh-thanh-phan-trien>. [Accessed 30 Mar. 2020]
- Ky Phu Commune (2018). *Features of Ky Phu commune situation*. [online] Available at: <http://xakyp Phu.hatinh.gov.vn/lich-su-hinh-thanh-phan-trien>. [Accessed 3 May 2020]
- Laoire, C. N. (2002). Young farmers, masculinities and change in rural Ireland. *Irish Geography*, 35(1), 16-27. <https://doi.org/10.1080/00750770209555790>
- Leder, S., Clement, F., & Karki, E. (2017). Reframing women's empowerment in water security programmes in Western Nepal. *Gender and Development*, 25(2), 235-251. <https://doi.org/10.1080/13552074.2017.1335452>
- Leder, S., & Sachs, C. (2019). Intersectional Perspectives on the Gender- Agriculture Nexus: Relational life histories and additive sex-disaggregated indices. In C. Sachs (Eds), *Gender, Agriculture and Agrarian Transformations. Changing relations in Africa, Latin America and Asia*. Routledge. <https://doi.org/10.4324/9780429427381>.
- Leichenko, R., & Silva, J. A. (2014). Climate change and poverty: Vulnerability, impacts, and alleviation strategies. *WIREs Clim Change*, 5, 539–556 <https://doi.org/10.1002/wcc.287>
- Lessa, I. (2006). Discursive struggles within social welfare: Restaging teen motherhood. *British Journal of Social Work*. 36(2), 283-298. <https://doi.org/10.1093/bjsw/bch256>
- Long, D. Lynellyn., Le, N. H., Truitt, A., Le, T. P. M., & Dang, N. A. (2000). Changing Gender Relations in Vietnam's Post Doi Moi Era. *The World Bank - Development Research Group*. [online] Available at: <http://documents.worldbank.org/curated/en/564931468315308766/pdf/341320Gender0wp14.pdf>. [Accessed 10 Apr. 2020]
- Luong, H. (2003). Gender relations: Ideologies, kinship practices. In H. Luong (Ed.), *Postwar Vietnam: Dynamics of a Transforming Society*, Rowman & Littlefield. 201-224.
- Lykke, N. (2011). Intersectional analysis: Black box or useful critical feminist thinking technology? In Lutz, H., Vivar, M. T. H., Supik, L. (Eds.), *Framing Intersectionality: Debates on a Multi-Faceted Concept in Gender Studies*, Farnham, UK: Ashgate. 207-220.
- MacGregor, S. (2010). "Gender and climate change": From impacts to discourses. *Journal of the Indian Ocean Region*, 6(2), 223-238. <https://doi.org/10.1080/19480881.2010.536669>

- Marr, D. G. (1984). *Vietnamese Tradition on Trial, 1920-1945*. University of California Press.
- McCall, L. (2005). The complexity of intersectionality. *Signs*, 30(3), 1771-1800.
<https://doi.org/10.1086/426800>
- McElwee, P. (2017). Vietnam's urgent task: Adapting to climate change. *Current History*, 116, 223–229.
- Mohanty, C. T. (1988). Under Western Eyes: Feminist Scholarship and Colonial Discourses. *Feminist Review*, 12(3), 61-88. <https://doi.org/10.1057/fr.1988.42>.
- MoNRE. (2011). Scenarios for climate change, sea level rise in Vietnam. Hanoi, Vietnam. [online] Available at: [http://www.scribd.com/doc/84393795/K %E1%BB%8Bch-b%E1%BA%A3n-B%C4%90KH-va-n% C6%B0%E1%BB%9Bc-bi%E1%BB%83n-dang-cho-Vi% E1%BB%87t-Nam-2011](http://www.scribd.com/doc/84393795/K%E1%BB%8Bch-b%E1%BA%A3n-B%C4%90KH-va-n%C6%B0%E1%BB%9Bc-bi%E1%BB%83n-dang-cho-Vi%E1%BB%87t-Nam-2011) [Accessed 3 Apr. 2020]
- Mukhopadhyay, M., & Prügl, E. (2019). Performative technologies: agricultural research for development and gender. *International Feminist Journal of Politics*, 21(5), 702-723.
<https://doi.org/10.1080/14616742.2018.1555004>
- Nation, M. L. (2010). Understanding women's participation in irrigated agriculture: A case study from Senegal. *Agriculture and Human Values*, (27), 163–176.
<https://doi.org/10.1007/s10460-009-9207-8>
- Nguyen, A. T., & Hens, L. (2019). Climate Change Hazards and Migration Along the Ky Anh Coast. In A.T. Nguyen, A. T., & L. Hens, *Human Ecology of Climate Change Hazards in Vietnam*. Springer Climate: Cham. https://doi.org/10.1007/978-3-319-94917-8_3. 63-79.
- Nightingale, A. (2009). Warming up the climate change debate: A challenge to policy based on adaptation. *Journal of Forest and Livelihood*, 8(1), 85-90. <https://doi.org/10.1088/1755-1307/6/7/572015>
- Nightingale, A. J. (2006). The nature of gender: Work, gender, and environment. In *Environment and Planning D: Society and Space*, 24(2), 165-185. <https://doi.org/10.1068/d01k>
- Nightingale, A. J. (2011). Bounding difference: Intersectionality and the material production of gender, caste, class and environment in Nepal. *Geoforum*, 42(2), 153-162.
<https://doi.org/10.1016/j.geoforum.2010.03.004>
- O'Brien, K., Eriksen, S., Schjolden, A., & Nygaard, L. P. (2007). Why different interpretations of vulnerability matter in climate change discourses. *Climate Policy*, 7(1), 73–88.
<https://doi.org/10.1080/14693062.2007.9685639>
- Palmer-Jones, R., & Jackson, C. (1997). Work intensity, gender and sustainable development. *Food Policy*, 22(1), 39-62. [https://doi.org/10.1016/S0306-9192\(96\)00030-9](https://doi.org/10.1016/S0306-9192(96)00030-9)
- Pearse, R. (2017). Gender and climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 8(2), 1-16 <https://doi.org/10.1002/wcc.451>

- Petesch, P., Badstue, L., & Prain, G. (2018). *Gender norms, agency, and innovation in agriculture and natural resource management: The GENNOVATE methodology*. [online] Available at: http://42q77i2rw7d03mfrd11pvzz.wpengine.netdna-cdn.com/wp-content/uploads/2018/02/GENNOVATE-Methodology_Feb2018_FINAL.pdf [Accessed 10 Apr. 2020]
- Rao, N., Lawson, E. T., Raditloaneng, W. N., Solomon, D., & Angula, M. N. (2019). Gendered vulnerabilities to climate change: insights from the semi-arid regions of Africa and Asia. *Climate and Development*, 11(1), 14–26. <https://doi.org/10.1080/17565529.2017.1372266>
- Rao, N., Mishra, A., Prakash, A., Singh, C., Qaisrani, A., Poonacha, P., & Katharine Bedelian, C. V. (2019). A qualitative comparative analysis of women’s agency and adaptive capacity in climate change hotspots in Asia and Africa. *Nature Climate Change*, 9(12), 964–971. <https://doi.org/10.1038/s41558-019-0638-y>
- Rao, N., Singh, C., Solomon, D., Camfield, L., Sidiki, R., Angula, M., Poonacha, P., Sidibé, A., & Lawson, E. T. (2020). Managing risk, changing aspirations and household dynamics: Implications for wellbeing and adaptation in semi-arid Africa and India. *World Development*, 125, 1-15. <https://doi.org/10.1016/j.worlddev.2019.104667>
- Ray-Bennett, N. S. (2009). The influence of caste, class and gender in surviving multiple disasters: A case study from Orissa, India. *Environmental Hazards*, 8(1), 5-21. <https://doi.org/10.3763/ehaz.2009.0001>
- Resurrección, B. P. (2012). The gender and climate debate: More of the same or new pathways of thinking and doing? In L. Elliott, M. Caballero-Anthony, *Human Security and Climate Change in Southeast Asia: Managing Risk and Resilience*. London: Routledge. <https://doi.org/10.4324/9780203107775>
- Resurrección, B. P. (2017). Gender and environment in the global south: From “women, environment, and development” to feminist political ecology. In S. MacGregor (Ed), *Routledge Handbook of Gender and Environment*. London: Routledge. <https://doi.org/10.4324/9781315886572>
- Resurrección, B. P. (2019). Water Insecurity in Disaster and Climate Change Contexts. In L. R. Mason & J. Rigg (Eds.), *People and Climate Change: Vulnerability, Adaptation, and Social Justice*, Oxford University Press. 52-67. <https://doi.org/10.1093/oso/9780190886455.001.0001>
- Ribot, J. (2010). Vulnerability does not fall from the sky: toward multiscale, pro-poor climate policy. In R. Mearns & A. Norton (Eds.), *Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*, World Bank publications. 47-74.
- Ribot, J. (2011). Vulnerability before adaptation: Toward transformative climate action. In *Global Environmental Change*, 21(4), 1160-1162. <https://doi.org/10.1016/j.gloenvcha.2011.07.008>
- Ribot, J. (2014). Cause and response: vulnerability and climate in the Anthropocene. *Journal of Peasant Studies*, 41(5), 667–705. <https://doi.org/10.1080/03066150.2014.894911>

- Rocheleau, D., Thomas-Slayter, B., & Wangari, E. (1996). *Feminist Political Ecology. Global Issues and Local Experiences*. London and New York, Routledge.
- Rutakumwa, R., Mugisha, J. O., Bernays, S., Kabunga, E., Tumwekwase, G., Mbonye, M., & Seeley, J. (2019). Conducting in-depth interviews with and without voice recorders: a comparative analysis. *Qualitative Research*, 1, 1-17
<https://doi.org/10.1177/1468794119884806>
- Rydström, H. (2020). Disasters, Ruins, and Crises: Masculinity and Ramifications of Storms in Vietnam. *Ethnos*, 85(2), 351-370. <https://doi.org/10.1080/00141844.2018.1561490>
- Sapkota, P., Keenan, R. J., Paschen, J. A., & Ojha, H. R. (2016). Social production of vulnerability to climate change in the rural middle hills of Nepal. *Journal of Rural Studies*, 48(C), 53-64. <https://doi.org/10.1016/j.jrurstud.2016.09.007>
- Saugeres, L. (2002). “She’s not really a woman, she’s half a man”: Gendered discourses of embodiment in a french farming community. *Women’s Studies International Forum*, 25(6), 641-650. [https://doi.org/10.1016/S0277-5395\(02\)00342-4](https://doi.org/10.1016/S0277-5395(02)00342-4)
- Scheyvens, R., & Leslie, H. (2000). Gender, ethics and empowerment: Dilemmas of development fieldwork. *Women’s Studies International Forum*, 23(1), 119-130
[https://doi.org/10.1016/S0277-5395\(99\)00091-6](https://doi.org/10.1016/S0277-5395(99)00091-6)
- Schmidt-Thomé, P., Nguyen, H., Long, P., Jarva, J., & Nuottimäki, Kristiina. (2015). *Climate Change Adaptation Measures in Vietnam*. Springer International Publishing.
- Sen, A. (1990). Gender and Cooperative Conflict. In I. Tinker (Ed.), *Persistent Inequality: Women and World Development*. Oxford University Press. 123-148
- Seregina, A. (2019). Undoing gender through performing the other. *Consumption Markets and Culture*, 22(4), 454-473. <https://doi.org/10.1080/10253866.2018.1512254>
- Solomon, D., & Rao, N. (2018). Wells and Well-being in South India: Gender Dimensions of Groundwater Dependence. *Economic & Political Weekly*, 53, 38–45. [https://advance-lexis-com.ludwig.lub.lu.se/api/document?collection=news&id=urn:contentItem:5S6K-CM61-DXMP-K0R9-00000-00&context=1516831](https://advance.lexis-com.ludwig.lub.lu.se/api/document?collection=news&id=urn:contentItem:5S6K-CM61-DXMP-K0R9-00000-00&context=1516831).
- Sultana, F. (2007). Reflexivity, positionality and participatory ethics: Negotiating fieldwork dilemmas in international research. *ACME*, 6(3), 374-385
- Tarp, F. (2017). Growth, Structural Transformation, and Rural Change in Vietnam - A rising dragon on the move. In *United Nations University World Institute for Development Economics Research (UNU-WIDER)*. <https://doi.org/10.1111/apel.12259>
- Teerawichitchainan, B., Knodel, J., Loi, V. M., & Huy, V. T. (2010). The gender division of household labor in vietnam: Cohort trends and regional variations. *Journal of Comparative Family Studies*, 41(1), 57-85 <https://doi.org/10.3138/jcfs.41.1.57>
- Thomas, K., Hardy, R. D., Lazrus, H., Mendez, M., Orlove, B., Rivera-Collazo, I., Roberts, J. T., Rockman, M., Warner, B. P., & Winthrop, R. (2019). Explaining differential vulnerability to

climate change: A social science review. In *Wiley Interdisciplinary Reviews: Climate Change*. 10:e565 <https://doi.org/10.1002/wcc.565>

Tschakert, P. (2012). From impacts to embodied experiences: Tracing political ecology in climate change research. *Geografisk Tidsskrift*, 112, 144–158.
<https://doi.org/10.1080/00167223.2012.741889>

UNDP. (2018). *Multidimensional poverty in Vietnam* (WIDER Working Paper 2018/127). [online] Available at: <https://www.undp.org/content/dam/vietnam/docs/Publications/MDP-full-E.pdf> . [Accessed 12 Apr. 2020]

Wangui, E. E. (2014). Livelihood Shifts and Gender Performances: Space and the Negotiation for Labor among East Africa's Pastoralists. *Annals of the Association of American Geographers*, 104, 1068-1081 .<https://doi.org/10.1080/00045608.2014.924734>

Watts, M. (2000). Chapter 16: Political ecology. In E. Sheppard, T.J. Barnes (Eds), *A Companion to economic geography*. Blackwell Publishing Ltd. 257- 274

World Bank. (2010). The economics of adaptation to climate change: A Synthesis Report. *World*. [online] Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/12750/702670ESW0P10800EACCSynthesisReport.pdf?sequence=1&isAllowed=y>. [Accessed 28 Feb. 2020]

Yadav, S. S., & Lal, R. (2018). Vulnerability of women to climate change in arid and semi-arid regions: The case of India and South Asia. *Journal of Arid Environments*, 149, 4-17.
<https://doi.org/10.1016/j.jaridenv.2017.08.001>

Ylipää, J., Gabrielsson, S., & Jerneck, A. (2019). Climate change adaptation and gender inequality: Insights from Rural Vietnam. *Sustainability (Switzerland)*, 11(10),1-16.
<https://doi.org/10.3390/su11102805>

Zwarteveen, M., & Neupane, N. (1996). *Free-riders or victims: Women's nonparticipation in irrigation management in Nepal's Chhattis Mauja Irrigation Scheme*. Research Report.IWMI: Colombo, Sri Lanka, [online] Available at: <http://ageconsearch.umn.edu/record/52731/files/REPORT07.pdf> (accessed on 15 September 2019). [Accessed 15 Apr. 2020]

Appendix A: List of Informants

Semi-structured Interviews with Male and Female Farmers

Respondent Number	Date	Gender	Age	Class	Commune	Marital Status	Relation to Head of Household
MR1	24/11/2019	M	37	non-poor	Ky Hai	married	head
MR2	24/11/2019	M	39	non-poor	Ky Hai	married	head
MR3	25/11/2019	M	40	near-poor	Ky Hai	married	head
MR4	25/11/2019	M	30	near-poor	Ky Hai	married	head
MR5	25/11/2019	M	59	non-poor	Ky Hai	married	head
MR6	25/11/2019	M	46	near-poor	Ky Hai	married	head
MR7	25/11/2019	M	35	near-poor	Ky Hai	married	head
MR8	26/11/2019	M	45	non-poor	Ky Hai	married	head
MR9	26/11/2019	M	50	non-poor	Ky Hai	married	head
MR10	26/11/2019	M	51	non-poor	Ky Hai	married	head
FR1	26/11/2019	F	57	poor	Ky Hai	single	head
FR2	26/11/2019	F	26	near-poor	Ky Hai	married	spouse
FR3	26/11/2019	F	45	poor	Ky Hai	single	head
FR4	27/11/2019	F	46	poor	Ky Hai	married	spouse
FR5	27/11/2019	F	26	non-poor	Ky Hai	married	spouse
FR6	27/11/2019	F	39	non-poor	Ky Hai	married	de facto head
FR7	27/11/2019	F	27	non-poor	Ky Hai	married	de facto head
FR8	27/11/2019	F	25	non-poor	Ky Hai	married	spouse
FR9	27/11/2019	F	43	non-poor	Ky Hai	married	de facto head
FR10	11/01/2020	F	73	poor	Ky Phu	widowed	head
FR11	11/01/2020	F	77	poor	Ky Phu	married	spouse
FR12	11/01/2020	F	42	poor	Ky Phu	single	head
FR13	11/01/2020	F	57	near-poor	Ky Phu	widowed	head
FR14	11/01/2020	F	76	near-poor	Ky Phu	widowed	head
FR15	12/11/2020	F	69	non-poor	Ky Phu	married	spouse
FR16	12/11/2020	F	55	non-poor	Ky Phu	married	spouse
FR17	12/11/2020	F	25	non-poor	Ky Phu	married	de facto head
MR11	12/11/2020	M	30	poor	Ky Phu	married	head
MR12	12/11/2020	M	67	non-poor	Ky Phu	married	head

Key Informant Interviews

Date	Organization	Level	Location	Position
23/11/19	Local Government	Commune	Ky Hai	Leader
23/11/19	Farmer's Union	Commune	Ky Hai	Leader
24/11/19	Women's Union	Commune	Ky Hai	Leader
24/11/19	Women's Union	Village	Bac Hai	Leader
10/01/20	Local Government	Commune	Ky Phu	Leader
10/01/20	Farmer's Union	Commune	Ky Phu	Representative
10/01/20	Women's Union	Commune	Ky Phu	Leader

Female Focus Group Discussion

Date	Respondent Number	Location	Age
10/01/2020	FR18	Ky Phu	36
10/01/2020	FR19	Ky Phu	43
10/01/2020	FR20	Ky Phu	27
10/01/2020	FR21	Ky Phu	58
10/01/2020	FR22	Ky Phu	63

Male Focus Group Discussion

Date	Respondent Number	Location	Age
10/01/2020	MR13	Ky Phu	29
10/01/2020	MR14	Ky Phu	57
10/01/2020	MR15	Ky Phu	33
10/01/2020	MR16	Ky Phu	61
10/01/2020	MR17	Ky Phu	39

Appendix B: Semi-Structured Interview Guide

Good morning/good afternoon. Thank you for speaking with me today. My name is Eoin O'Dwyer. I am a student from a university in Sweden. Although I have been working with a Vietnamese agricultural organization for the last few months. I am interested in the changing climate and in women and men's different roles and activities in farming and in the household. This is (translator's name). He/she has been working with me and interpreting Vietnamese for my study. (translator introduces themselves)

I want to talk to you today as you have knowledge and experience of living and farming in Ky Hai. Some questions will be about general farming life, while others will be specifically about how decisions are made in your household. Your participation today is confidential. Your names will not be used or published in any way. Your views and experiences are very important to us please feel free to express your opinion, there are no good or bad answers. You are of course free to leave the conversation at any time. It is okay if you do not wish to answer a question, and we can return to a question later if you wish.

I cannot say that you and your community will benefit from this study, but the information that we discuss can help gather important knowledge about farming, climate change, and men and women's experiences of living and working in Vietnam. The interview should take around seventy minutes.

Do you have any questions before we begin?

Do you wish to participate?

Verbal consent: Yes No

Part One: Respondent and Household Demographic and Socio-economic Information

Can you give me information about your:

- Age
- Crops
- Livestock
- Non-farm livelihoods
- Area: Farm, house, home garden
- Household members (gender, age, occupation, location)
- Time spent living in village

Part Two: Guiding Questions

1 Farming Work

1.1. What farming activities are you more responsible for?

(use activity cards)

- Probe
 - Why are you best suited for these activities?
 - Does somebody help you with this? Who?

1.2. What farming activities are other household members more responsible for?

(use activity cards to separate by household members)

- Probe
 - Why are they best suited for these activities?

1.3 What farming activities take the most time?

- Probe:
 - Most exhausting?
 - Dislike doing?
 - Swap labor family and neighbors?

2 Household Activities

2.1. What important roles do you play in your household and home garden? Important roles mean that you know the best and you are responsible for that

(use activity cards to separate by household members)

Probe:

Why are you best suited for these activities?

2.2. What important roles do other household members complete in the house and home garden?

Probe:

- Why are you best suited for these activities?

2.3. Please describe a typical day from waking up in the morning going to sleep at night.

Probe:

- Spouses day
- Who in your household starts/finishes daily activities first?
- What do you do during free time?

3 Technology

3.1. What machines do you use at home or on the farm?

(use activity cards)

Probe:

- Which of your activities would most benefit from mechanization? Why?

3.2. Are there machines that your spouses uses that you would not use? Why?

4 Farming Systems and Diversification

4.1. How has your crops and home garden changed over the last five to ten years?

Probe:

- Why?
- How did you feel about this change?
- Whose labor was most affected by this change?

4.2. Apart from farming, do you have other livelihood sources?

Probe:

- Why did you start this activity?

- How has this changed over the last ten years?
- 4.3. Do you feel you are that your life has become better or worse over the last ten years?
Probe:

- What caused this change?
- How does this make you feel about the future?

5 Climate Variability

5.1. Do you feel that the climate has changed over the last ten years?

Probe:

- How has it changed?
- Intensity and frequency of storms, floods, hot spells, cold spells, heavy rain, drought

5.2. What type of weather do you worry most about? (Examples: storms, floods, hot spells, cold spells, heavy rain, drought)

Probe:

- Why?

5.3. How is your livelihood affected by ____? (Examples: storms, floods, hot spells, cold spells, heavy rain, drought)

5.4. Which farming activities are most affected by _____? (Examples: storms/drought/hot spell/cold spell/ floods/ heavy rain?)

(use activity cards to discuss different activities and effects)

Probe:

- How has your farming practices changed in response to this?
- Have these changes been effective?
- How does this affect your schedule?

5.5. What bad weather events have you experienced over the last three years?

5.6. Can you describe to me your experience of the last very bad storm in your area?

Probe:

- Actions during storm
- Physical and emotional experience
- How was your house/farm/livestock/home garden damaged by these storms and floods?
- How long did it take to recover?
- Do you receive help from non-household members or community organizations after storms?

5.7. Before a storm what extra work or responsibilities do you have to prepare your house?

Probe:

- What do other household members do to prepare?

5.8. What extra responsibilities or work do you have at home or in the field after a bad storm?

Probe:

- How does other household members' work change after a storm?

6 Decision-making

This tool can help us talk about household decision making.

(show Ladder of Power and Freedom and describe the steps)

6.1. What step of the ladder do you feel reflects your decisions?

Probe:

- Why do you feel that you are on this step *(examples)*
- Is this the same for other (men/women) in your village?
- What step are other adult household (spouse/parents/in-laws) members on?

- Is this household decision making system similar or different from other households in your village?

(Use these results as basis for discussing changes and decisions previously discussed)

6.2. For what farming and household activities can you make autonomous decisions?

(Use activity cards to separate activities by household member's decisions)

Probe:

- Why do (you/they) make decisions for this activity?

6.2. When your farm changed from (peanut) to (sweet potato), who made this decision?

Probe:

- Why did (you/they) make this decision?
- Was there a discussion before?
- Who started the conversation?
- Who made the final decision?
- Decisions: farming inputs purchase and selection

6.3. When you began (previously discussed non-farm activity), how was this decided?

6.4. How do you resolve disagreements over large decisions?

6.5. If you really wish to do something or buy something but your (husband/wife) does not agree, how could you convince them? *(try ground this in examples from a previous question)*

6.6. Do you feel you can make more decisions since earlier in your marriage?

Probe:

- How and why has this changed?

Ask this if husband is currently migrated or has so in the past:

6.7. Do you feel that decision-making changes when (you are/your husband is) away?

Probe:

- Did this change any of your household members positions on the ladder?

Ending:

- Do you feel that there are any important topics that we did not discuss?
- Do you have any questions about the interview or my study?

Thank you very much for giving me your time and sharing your thoughts.

Appendix C: Focus Group Guiding Questions

Same introduction and verbal consent as seen in Semi-structured Interview Guide found in Appendix B

1. What are the biggest challenges for farming livelihoods in this community?
2. How do you cope with events such as flooding, drought, hot spells, cold spells, heavy rainfall and storms?
 - a. What support does the government supply for these different types of weather?
 - b. Who has to work longer after a storm in this community?
3. Who is most vulnerable to these weather events? Think about the last bad weather event, who was most affected?
 - a. Discuss different livelihood sectors/gender/age/disability
 - b. What are the differences in how poor households and wealthier households are affected by storms/ droughts/ and hot and cold spells?
4. What agricultural activity is the most time consuming for rice farming?
(rank activities using activity cards by discussion and debate)
(rank for after a storm to recover).
 - a. What activities do you have to repeat because of storms/hot spells/ droughts/ cold spells?
5. Before a storm how are different choices and preparations prioritized?
 - a. How are these decisions made and who makes them?
 - b. Have pre- storm decisions ever negatively affected what happened during or after a storm?