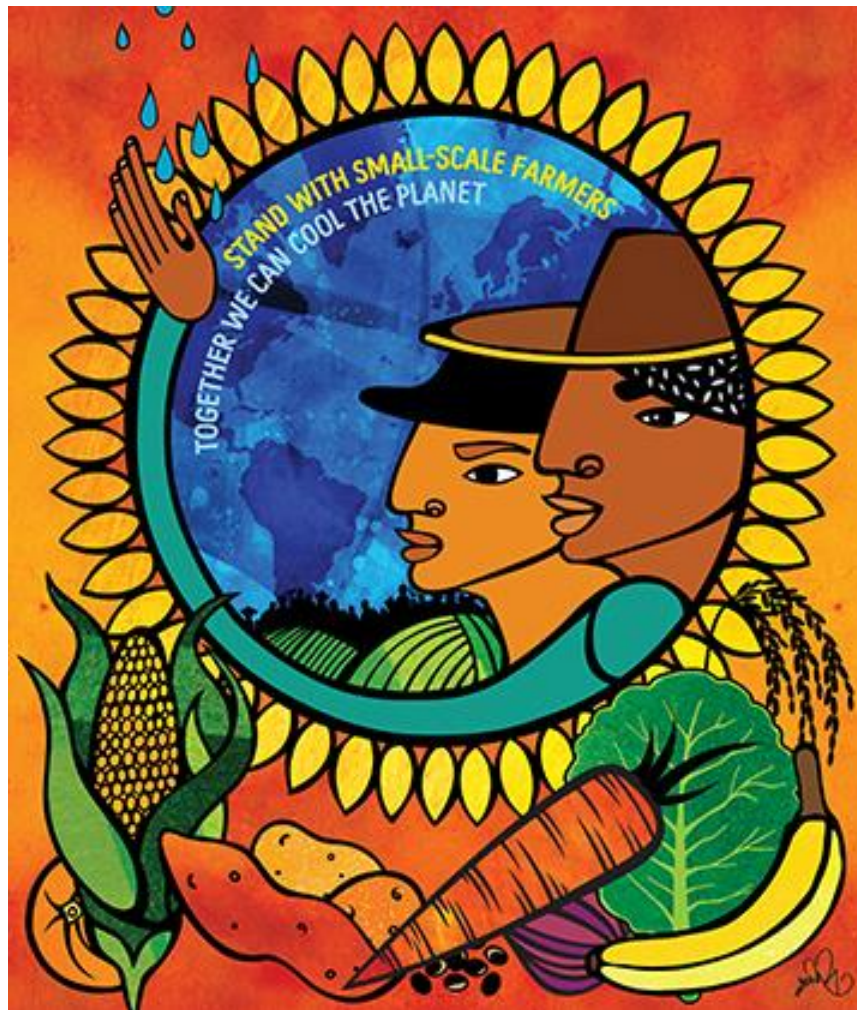

The Impact of Climate Variation and Change on Gender Dynamics from a Vulnerability and Adaptive perspective:

*A Closer Examination of Smallholder Farmers' Gender Dynamics in the Global
South through a Systematic Literature Review*

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Abstract

The current thesis sets out to find the influence of Climate Variation and Change [CVC] on the gender dynamics, vulnerabilities and adaptive capacities of smallholder farmers in the Global South. The impact of CVC is explored by using a Systematic Literature Review [SLR]. This entails a comprehensive selection process, classification and inclusion criteria through which 56 relevant peer reviewed articles were selected and studied. Research niches are found in social dynamics of CVC impacts and the very regional research scope. The current SLR facilitates the research by showing a global, general and transparent overview on this subject.

The relevant articles show that female and male smallholder cultivators have different levels of vulnerability and adaptation capacity in regard to CVC. CVC amplifies gender inequalities, enhances vulnerabilities and urges communities to become more resilient. Women are often lacking access to representation, finances, inheritance rights, information and knowledge. Furthermore, the research found that women cultivators in the Global South often lack power to influence important decision-making processes to adaptation strategies and other higher investments. Female cultivators also generally lack representations and involvement within policies, meetings and development strategy inputs. This all makes women more vulnerable in times of climatic stress. Gender subordination is found in all sectors of agricultural activities, and is often driven through social, cultural and institutional barriers.

The findings show that CVC and gender are inseparable and mutually inclusive. The higher level of vulnerability of women seems to be linked to lack of access, assets and control over natural resources. There is an urgent need for women and previously marginalized groups to be included in decision-making processes and become more empowered. It is crucial to focus on all barriers smallholder farmers might face in CVC situations. Empowerment of women is the key to achieving more global food security and finding more resilient ways of battling CVC.

Keywords

Climate Variation and Change (CVC), Systematic Literature Review (SLR), gender, gender dynamics, vulnerabilities, adaptation, adaptive capacity, agriculture, smallholder farmers, Global South



¹ Photo page 1: <https://fairworldproject.org/get-informed/movements/fair-climate/>

Photo page 2: <https://www.oxfamamerica.org/explore/stories/emerging-artist-paints-with-a-purpose/>

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The paper is written for all women worldwide who are fighting for equality, acceptance and respect. Throughout time, historical figures like Harriet Tubman, Amelia Earhart, and Rosa Parks, who refused to be boxed by their genders and fought for equality paved the road for inspirational young activists like Malala Yousafzai, Jamie Margolin and Greta Thunberg today.

Another group of people who earn respect is formed by smallholder farmers throughout the world who are facing the negative impacts of climate change in their daily routines. I hope this thesis can give a voice to the millions of families working against the clock. I wish this thesis can shed some light on the accumulating struggles they face, especially the often-overlooked female cultivators.

*“For most of history, Anonymous was a woman”
Virginia Woolf*

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List of Abbreviations

AC	Adaptive Capacity
AF	Access Framework
CC	Climate Change
CVC	Climate Variation and Change
FAO	The Food and Agriculture Organization
FPE	Feminist Political Ecology
GO	Governmental Organization
GS	Global South
IPCC	Intergovernmental Panel on Climate Change
LIC	Lower-Income Countries
NGO	Non-governmental Organization
SHF	Smallholder Farmers
SLR	Systematic Literature Review
SSA	Sub-Saharan Africa
SV	Social Vulnerability
UN	United Nations
WFP	World Food Program

Chapter 1: An Introduction

‘Man made Climate Change’ [CC] impacts many farmers in today’s world. For the past decades, CC has influenced the agricultural world through various channels including rising temperatures, more precipitation, and more extreme weather events (Below et al., 2012; Van Tuyen et al, 2010; Van den Berg et al, 2003). As CC and a differentiation in climate variation and change [CVC] have shifted and increased over the past decades, agricultural production in rural developing areas has changed significantly. The following sections explain the current thesis in more detail by focusing on gender dynamics of smallholder farmers in the Global South [GS], adaptation and vulnerability, the research niche, relevance and importance of this thesis.

1.1.1 Smallholder Farmers

Smallholder farmers [SHF] face many problems and are immensely impacted by CVC in the Global South. Because of increasing climate changing patterns throughout the seasons, the farmer’s experience more food insecurity, income loss, and “are intrinsically vulnerable to any shocks that affect their agricultural systems” (Harvey et al., 2014, 7). For example, in many African countries, the rice smallholder farmers lack good housing, electricity, and clean water (Harvey et al., 2014). The living conditions are often intrinsically worse than on large-scale farms that have more capacity and capabilities to adapt to climate risks. With the rise of CVC, the lack of resources to gain access to better mechanization strategies can influence the lack of irrigation, especially during a drought. The extreme weather patterns can create problems for short-term and long-term agricultural production. Some reasons for decreased agricultural production in developing regions include inadequate access to water, inadequate tools to produce crops for export (small landholdings), soil degradation after long term cropping, and a shrinking of lands because of rising commercial production.

Nonetheless, previous research found that smallholder farmers are “agents of change” that in turn “are well-acquainted with how a changing climate affects their crop production” and adjusted their “management practices effectively to slowly reduce the negative impacts” of CVC (Altieri & Nicholls 2013; Astier et al, 2011; Crane, Roncoli, & Hoogenboom, 2011; in Burnham & Ma, 2016, p. 2). Within rural areas of lower-income countries, these farmers tend to be a large part of the rural demographic (Lowder et al., 2014 in Carranza & Niles, 2019). These farmers have in a typical setting, “less than five acres of let, yet provide more than half of the food production of developing countries” (Carranza & Niles, 2019, p. 2). Furthermore, smallholder farmers are generally agriculturalists that own petite plots, which they rely almost exclusively on family labor. In addition, one or two cash crops are grown. The households could live from “rice, livestock, non-rice, rental fees from land, animals, machines” that include both non-farming and off-farming activities (Paris et al., 2009, p. 12). Smallholder farming is often a family effort, hence many people within the family help out on the land.

1.1.2 Women and Smalholder Farms

Female participation in the agricultural sector is often defined as “the absolute number of females whose major economic activity is working in agriculture as either a cultivator or laborer” (Chanana-Nag & Aggarwal; 2018, p. 16). In addition to agricultural practices, women are often in charge of many of the household responsibilities, including taking care of the children and the majority of the housework. However, in many contexts, the husbands remain the head decision maker in “resource use” and “head of the household” (Ha et al., 2015, p. 36). There is an urgent importance in exploring the relationship between CVC and smallholder farmers with a specific focus on gender. Therefore, the current research focuses on gender, agriculture and CVC since women make up a large percentage of the workforce on smallholder farms and are important contributors to production, but still lack equal access to resources, adaptation and a cultural acceptance in many cultures.

1.2 Relevance

The feminization of agriculture means an increase of female participation within the agricultural sector. This phenomenon has only been infiltrating the research and academic world since the 1960s, but women have always played a central role within the agricultural sphere. The trend saw an increase in Latin America from 2005 onwards, which was often due to “male outmigration” and other “off-farm employment opportunities” for men (Anderson & Sriram, 2019, p. 3). This in turn led to more women becoming principal farmers. The feminization of agriculture as Tamang et al. found “is a serious cause of social exclusion and injustice” (2014, p. 20). It generally has a negative impact (Anderson & Sriram, 2019) but can also be empowering. While taking over roles of males and youth, one would expect more empowerment for women, however, these additional roles and tasks are burdens. With the rise of CVC, it is important to see how different genders experience the effects and are able to adapt and become more resilient.

The topic of this current research is relevant because many smallholder farmers in today’s changing world are finding different ways to challenge CVC and adapt to the new weather patterns. Studies vary on the number of smallholder farmers in the Global South as 2 or 2.5 billion (Call & Sellers, 2019; Carranza & Niles, 2019) seems to be an immensely high amount (Doss et al., 2018). However, low- and middle-income countries do benefit from these farmers and can be a crucial livelihood strategy for many in the direct and indirect environment. The farmers with less than five acres of land do provide “more than half of the food produced in low-income countries” (Carranza & Niles, 2019). So, regardless of the exact numbers of small holder farmers, they hold an important role in the global food production and food security of millions.

Smallholder farmers constantly adapt to the external factors and it is fair to acknowledge that even if CC has increased over the past decades, farmers have always had existing challenges, problems, changing farming systems, environmental problems and environmental adaptation strategies. However, the impact of CVC in the recent years exceeds the previous struggles, as there is more uncertainty, reduced access to food, disruptions of production, detrimental effects on food quality, utilization and stability and these only keep increasing. Together with CVC comes the uncertainty of food security, as CC multiplies the instability of food security leading to more undernourished and hungry people in the future. Countries that face higher levels of malnourishment, are often the most impacted by CVC and lack resources to adapt.

In the Global South, there is a substantial increased vulnerability predicted for “millions of smallholder farmers, due to the increase” of CVC effects on agricultural production (Nelson & Stathers, 2009, p. 81). All this together means less “security of food supplies and livelihoods,” “increased malnutrition,” and increased “spread of diseases” (Momsen, 2019, p. 137). Finally, the increased CVC effects already kill 150,000 people yearly (Stopes 2009 in Momsen, 2019) and “99 per cent” of these deaths occur in the Global South (Vidal 2009 in Momsen 2019, p. 137). Moreover, food security continues to become more concerning in the future, adding to the already “815 million” people “classified as malnourished in 2016” (Carranza & Niles, 2019, p. 3). With the recent COVID-19 pandemic both “lives and livelihoods” are at risk.² There is a looming food crisis because of the pandemic, and as World Food Program [WFP] executive Director David Beasley warns:³

As the virus spreads, “an additional 130 million people could be pushed to the brink of starvation by the end of 2020. That’s a total of 265 million people.”

“1.6 billion children and young people are currently out of school due to lockdown closures,” he said. “Nearly 370 million children are missing out on nutritious school meals — you can only imagine when children don’t get the nutrition they need their immunity goes down.”

Moreover, a 2020 Global Food Crises Report⁴ (without coronavirus’ effects added):

Out of the 135 million suffering acute hunger:

- 77 million are in conflict affected countries
- 34 million are in climate shock subjected places
- 24 million are in places affected by humanitarian crises

Besides fearing the current virus pandemic, David Beasley warns for an upcoming hunger pandemic with “multiple famines of biblical proportions” that “could result in 300,000 deaths per day.”⁵

1.3 Research Niche

The research niche is that many articles tend to focus on the technological adaptations, policies, altering farming strategies, or changes in and distribution of CVC patterns, without focusing much on the social dynamics and aspects. Additionally, the traditional farmer is generally still seen as a male, whilst many female cultivators have taken over the roles of men since the early 1970s.

For example, many of the articles about the rural-urban migration of farmers (Rola-Rubzen 2010; Paris et al, 2009) mention the shift in gender relations, meaning that more males migrate away to find better employment opportunities, leaving the women behind without focusing much on the social aspects. These women are now in charge of the traditional male tasks that include “irrigating the fields, spraying chemicals, and marketing the farm products” (Paris et al, 2009: 1). However, even if these smallholder women have crucial roles within

² <http://www.fao.org/2019-ncov/q-and-a/impact-on-food-and-agriculture/en/>

³ <https://insight.wfp.org/wfp-chief-warns-of-hunger-pandemic-as-global-food-crises-report-launched-3ee3edb38e47>

⁴ https://docs.wfp.org/api/documents/WFP-0000114546/download/?_ga=2.208978578.1604501587.1587364510-1264218027.1561107831

⁵ <https://insight.wfp.org/wfp-chief-warns-of-hunger-pandemic-as-global-food-crises-report-launched-3ee3edb38e47>

the agricultural sphere, they face gender discrimination and are not culturally perceived as farmers (Paris et al., 2009). Nonetheless, there are knowledge gaps in relation to the influence of CVC on intersectional dynamics and potential shift in these dynamics. Another argument is that the technical ways of adapting to CVC are not the whole story, the social ways of adaptation can provide a clearer picture of the underlying reasons, opinions, and motivations and are a key to feasibility of any adaptation strategy. Technical farming systems highly interrelate with the broader social, economic and cultural structures in place.

The focus on gender is still a research niche, but very relevant because women produce over 50 percent of the food consumed in the current world and make up 43 percent of the total agricultural labor force globally (Akter et al., 2017; Doss, 2014). Furthermore, previous empirical research indicated that women (compared to men) invest “as much as 10 times more of their earnings in their family’s well-being, in areas including child health, education and nutrition” (Duflo, 2012; Maertens and Vershofstadt, 2013; in Akter, 2017, p. 270). Meaning that women and the concept of gender are highly critical in the debates around agriculture and CVC. In the past decades, there has been research on women in agriculture, however the main focus of these articles was mostly on ‘Sub Saharan Africa’ and not as much focused on South-East Asia or Latin America (Akter et al., 2017, p. 271). Moreover, these researches were very regionally focused, and the current thesis provides a general Global South overview. For example, in 2014 the International Food Policy Research Institute (IFPRI) and Food and Agricultural Organization (FAO) did research about gender in agriculture (Quisumbing et al., 2014). However, even if the research was called ‘Closing the Knowledge Gap,’ the greater number of research was conducted in “Sub Saharan Africa (59%),” “South Asia (22%)” and only “6% of the research was conducted in Southeast Asia” (Akter et al., 2017, p. 271). This indicates that there is still a lack of research in geographical regions like Asia and Latin America.

1.3.1 Relevance of Systematic Literature Review

The current thesis uses a Systematic Literature Review [SLR]. The SLR is relevant, useful and important because many of the policies implemented in agricultural and rural areas focus on the needs of males and tend to neglect the position of women (Momsen, 2019; Chi et al., 2015; Terry, 2009; MacGregor, 2010). One example is the Intergovernmental Panel on Climate Change [IPCC], an intergovernmental body of the United Nations [UN] which specifically focusses on the issues of CC but has in the past often lacked behind with no gender focus. The IPCC forms the basis of “climate science and policy research” for many governments around the world, and these depend on the research when “setting national targets and making policies to address climate change” (MacGregor, 2010, p. 2). This is therefore a very important source of information that has a large reliance and dependence globally. Therefore, it is quite distressing that in the 52-page IPCC’s Fourth Assessment Report, *Climate Change 2007*, the word ‘gender’ is not even mentioned. The word ‘women’ is mentioned only once which was in relation to the workload reduction in rural developing areas by converting to greener energy sources (MacGregor, 2010, p. 2). Even though, this report was written a while ago, it is still quite appalling that in the year 2007, by an organization that should represent global citizens, women are left out of the conversation. This phenomenon is commonly known as “gender-blindness” and is still a reality in policies, journals and literature today. There should be a more comprehensive focus to avoid “gender-blindness” in future research.

Even though the important role of women in agriculture has been recognized since the 1990s decisions and policies tend to still exclude them (Romero-Paris, 2004). Feminist scholars as Geraldine Terry, a PhD researcher with often a gendered focus, writes that “academics, gender and development practitioners, and women’s rights advocates *are still only starting to grapple* with many gender dimensions” [of CC] (2009:5). Meaning that in relation to CVC and the ever changing environmental, social and economic consequences that come with the phenomena, a strong gender focus only infiltrated the development world in the past few years. When talking about CC and gender, there needs to be more awareness for the disregard between genders and their different vulnerabilities (Nelson et al., 2002). In addition, CC and variation are not gender neutral, since women and men are affected differently (Agnes et al., 2010 in Chi et al., 2015; Agarwal, 2011; Denton, 2004; Mlambo-Ngcuka, 2015; Terry, 2009). Even if included in the decision-making process or in policies, women tend to be talked about as a homogenous group with the same characteristics and same vulnerabilities and clumped together when implementing these policies (Dankelman, 2002). This is risky, as often male dominated organizations, make decisions for women in general without looking at the distinction between them.

Furthermore, women tend to face “gender-specific barriers” that potentially limit their ability to cope with CVC and to adapt (Terry, 2009). Moreover, women’s livelihood options tend to be much more limited compared to those of men in the same communities. There needs to be a shift in looking at CC from a male-centered focus towards a more comprehensive and inclusive implementation of policies and agricultural regulations. The latent can be done by focusing on a SLR approach and aiming to generalize data from all over the developing world to see what information is found and what can be done in the future. Moreover, a research gap exists since many of the articles focus on specific contexts within the Global South, but there is a lack of a general overview that brings the existing data resources together and provides insights into the gaps missing.

The current research is relevant since it deals with a current and urgent issue, adds more general insights from all Global South continents into a previously very context specific topic. Furthermore, it focusses on the importance of the social aspects of climate change impacts and the gender debate within agriculture. Currently, there are not many SLRs on this topic, so this research can be helpful for policy makers.

1.4 Importance in Development Studie Debates

This current thesis focusses on smallholder farmers because they hold a substantial role in the world’s food production. Within low-income-countries [LIC] these farmers hold the food security in place and provide a stable income for over 200 million people. Moreover, these farmers lay the foundation for some of the world’s most important crops and products, as rice, cocoa, soy and palm oil that keep the world’s food system in place. For the farmers with less capabilities to adapt to changing weather patterns, it is very important to be aware of their situations, problems and potential solutions in order to prevent nutritional deficiencies for millions (if not billions) around the world. Training these farmers to become more resilient and better adaptive in the future, could lead to better productivity and less global hunger. In order to train the cultivators in the Global South well, it is important to focus on the different gender needs. Since many of the articles discussing the topic focus on context specific needs and adaptations to CVC, it is important to have a general overview of the current research available in order to secure, establish and make farms more resilient and inclusive in the future by identifying research gaps.

1.5 Research Objectives

The aim of the present thesis is to delve into many articles related to CVC, gender and agriculture in order to see how smallholder farmers are able to adapt to CVC impacts or not. This will be done by focusing on six overlapping questions that will aim to bring a coherent and general overview of the research about these topics up until now.

The topics discussed in the results are as follows, firstly the effects of CVC on agriculture will be discussed, and the importance of women within the agricultural sector. Secondly the traditional gendered roles and tasks in agriculture and if this changes with CVC. Thirdly, the vulnerability level and access adaptation strategies will be discussed. Fourthly, how gendered farmers are represented in policies. All in all, the aim is to answer the following research question:

How does climate variability and change impact smallholder farmers' gender dynamics from the perspective of vulnerability and adaptive capacity in the Global South?

The thesis delves into the influence and impact that climate change has on the vulnerabilities of smallholder farmers, the capabilities to adaptation that differ per gender and how gender dynamics can shift.

The thesis is structured as follows, Chapter 2 contains a conceptual and theoretical section that shows the theoretical lens used in the current thesis and the current available knowledge on the topic. This section delves into gender, intersectionality, feminist political ecology, access framework, vulnerability and adaptation. The following Chapter 3 consists of the methodology in which the research questions are defined, the SRL is explained as well as other parts of the data collection. This part is followed by the findings that are divided into chapters as seen below. The final chapter is a specific case study about the rice sector in Viet Nam. The results are followed by a discussion and concluding remarks.

Findings Chapter	Title
Chapter 4 (general)	Climate Change and Smallholder farmers
Chapter 5	Importance of Women in Agriculture
Chapter 6	Traditional Gendered Farm Roles and CVC
Chapter 7	Vulnerability and Access to Adaptation Strategies
Chapter 8	Representation in Policies
Chapter 9	A Case Study of the Rice Sector in Viet Nam

Chapter 2: Theoretical Framework

This chapter provides the main theories, concepts and approaches that are in turn related to the research questions. The theories are used to understand the underlying dynamics of the theoretical framework and aim to understand the research in more depth. The main concepts for gender are gender itself, an intersectional approach and the thorough feminist political ecology. These are followed by the theories of access framework, vulnerability and adaptation in order to understand CVC and its social and environmental impacts on smallholder farmers.

2.1 Gender

2.1.1 Gender specific

The present research will ultimately focus on the aspect of gender and intersectionality to understand the social dynamics of cultivating, farm divisions and access to adaptation strategies. In turn, by continuing to focus on gender, intersections and divisions on the land and in the household are sought after through a gendered lens. The aim is to see how CVC impacts the gendered relations of smallholder cultivators.

Moreover, research about the gender divisions within the agricultural sector and labor in general:

“are useful for identifying the points at which men or women can create leverage on the basis of the tasks they perform to secure a greater measure of influence, if not formal control, for themselves” (Bossen, 1989 in Jha, 2004, p. 552).

After the first wave of feminism in the early 20th century, with a focus on the Western world and the right to vote, empirical data started to slowly focus more on the differences between genders, and how women lack equity. With regards to development and gender, the first major approach to include more women was the Women in Development (WID), later a more specific Gender and Development (GAD) followed (Peet, & Hartwick, 2015). In addition, Women, Environment and Development (WED) arose that still influences many policies and theories today. Themes that emerged with WED included a political ecology perspective, environmental rights and sustainable development techniques. However, many of the approaches ignore daily realities of different women, stem from Western perspectives, and identify women as a homogenous group.

Today, gender is informed by cultural, historical and social already gendered conceptions. Gender can be defined as the socially constructed roles and behaviors that seem appropriate for men and women. These differ between societies but can also shift between regions and traditions. Therefore, it is important to view gender from a more bottom-up and inclusive approach by focusing on intersectionality. Existing literature found that women in South-East Asia are typically granted a more empowered position (compared to other women in the Global South) when it comes to a higher role at the decision-making process at the household level (Akter, 2017). The phenomena empowerment also translates to more control over “their own earnings” (Akter et al., 2017, p. 270). Even if some articles discuss that the amount of empowerment women have the latent depends on the context and community. For example, Alkire et al., describes that in certain communities, women can influence the “decision

making process over production and input” but they remain “disempowered with respect to asset ownership, control over income, or community leadership” (2013, p. 271).

2.1.2 Gender in Agriculture

Two phenomena are concluded by social scientists studying feminist approaches with regard to agricultural research (Jha, 2004). Firstly, women have been neglected from being mentioned in academic research about agriculture in the past decades. The research was mostly from a male perspective only that resulted in a cultural blindness to women farmers and the perception was that all farmers were men. Secondly, there is a growing feminization of agriculture because of the male-outmigration to the larger cities in order to find work. Women are forced to pick up the traditionally male tasks in order to keep the farm running. In one sense this is beneficial for women because they gain more authority, on the other hand the household tasks and maintenance are also still part of their daily chores. For example, in Bali, the decision-making process about resource management is conducted in the contexts of the agricultural communities the farmers are part of, instead of the individual households (Jha, 2004).

Current empirical research of the topic ‘gender in agriculture’ and ‘gender and agriculture’ acknowledge that women:

“Lack access to and control over resources such as land and capital as well as agricultural inputs and technology such as improved crop varieties, training, information and marketing services” (Fletschner and Kenney, 2014; Akter, 2017, p. 271).

Moreover, previous research indicates that:

“Women have an unmanageable workload, they lack access to credit or have no decision-making power over credit and are poorly represented in agricultural and non-agricultural groups and organizations” (Akter et al., 2017, p. 271).

Existing literature about gender and agriculture demonstrates a lack of women’s inclusion in decision-making processes outside the household in for example development/agricultural programs and/or projects (Akter et al., 2017; Alkire et al., 2013; Boyd, 2002; Carr & Thompson, 2014; Dankelman 2002; Galina & Rozel Farnworth, 2016; Kabeer 2005; Kelkar, 2009; Lambrou and Paina 2006; Momsen, 2019; Nelson & Stathers, 2009). These articles continue to state that women face barriers to decision-making beyond the cultivation sector and this extends to socially constructed rules of who can sell, travel or have free mobility (Carr & Thompson, 2014). It is therefore of high importance to look at access to adaptation strategies, the level of vulnerability and differences between socially constructed roles for men and women through their intersections in order to see the climate-related concerns. The lack of decision-making or other accesses can prevent one from becoming climate resilient and is critical to shaping agricultural outcomes.

Furthermore, there is a vast amount of literature that focusses on the difference between access, income and ownership to resources when comparing the farming strategies of Sub-Saharan Africa [SSA] to South Asia (Akter, 2017; Carranza & Niles, 2019; Doss, 2014; Huyer, 2016; Ihalainen & Sijapati Basnett, 2015; Jost et al., 2016; Nelson & Stathers, 2009).

2.1.3 Women and CVC

It has been found that women and men experience the increase of CC differently (Chanana-Nag & Aggarwal, 2018; Chi TTN et al., 2015; Dankelman, 2002; Echeverria, 2020; Food and Agriculture Organization [FAO], 2007). As stated before, women tend to have less of a role in the decision-making processes, because they have less rights, less access to resources and less mobility compared to men (FAO, 2007). In the figure below, the different types of impacts on genders are shown compared to CVC impacts. These are just a few, and there are many more. Moreover, women tend to be the most vulnerable and defenseless groups with regards to both CC and agrarian locations (Thi et al., 2019). And the work burden of women can be exacerbated by climate variation, as their workdays can be longer and more work burdens can arise (Rocheleau et al., 1996).

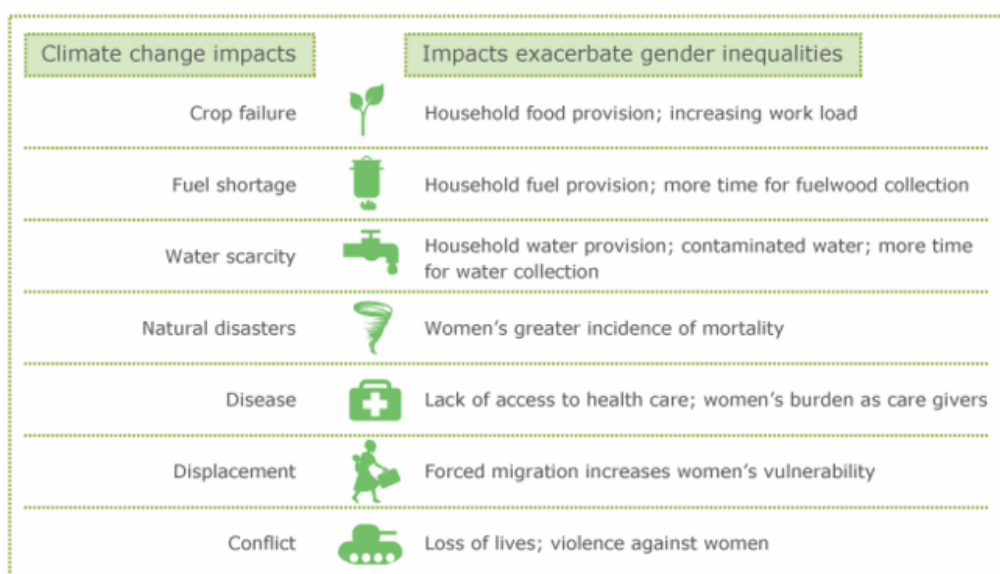


Figure 1: “Gender-differentiated impacts of climate change on women” (World Bank, FAO, 2017)

It is important to look at gender and intersectionality in the agricultural sector through the lens of a feminist political ecologist. This provides more information on the relation between genders, and different forms of intersectionality with agriculture, environment and CVC. In turn, this will reflect the various roles, positions, and potential adaptation strategies of gendered smallholder farmers.

2.1.4 Intersectionality

The current thesis aims to look at gender from an intersectional point of view. As many scholars use the term intersectionality in different ways, the current research defines it as the following:

“the relationships among multiple dimensions and modalities of social relations and subject formations” (McCall, 2008, p. 1771).

The term was first used by Crenshaw in 1991 and helps to understand the vast dynamics of differentiated vulnerability and adaptation that are constrained to social and cultural power relations (McCall, 2008; Ravera et al., 2016). The interplay of multiple identities help to “shape a differentiated vulnerability to risks and disasters” (Ravera et al., 2016, p. 336). These dimensions entail in the current research the differences between age and generation, gender, class, caste, ability, education, and other axes of identity. In the case of farmers, this also includes if the farmer owns the land they work on. The cultivator could rent land or work as an agricultural laborer which in turn affects decisions, vulnerability and adaptation differently than when they would own the land.

There is a growing body of literature focusing on the intersectional approach. Many of these researcher’s state that it is critical to include “intersectionality on adaptation to climate change in agrarian settings” (Carr and Thompson, 2014; Kaijser & Kronsell, 2014; Sultana, 2014; Ravera et al., 2016, p. 336). Moreover, these intersections of power are found at every level of the society, from individual to institutional levels and are often prone to shifting. Knowing the feminist aspects of knowledge and power production can help gain insights into inclusions and exclusion processes (Kaijser & Kronsell, 2014).

2.1.5 Feminist Political Ecology

In addition to theories about gender, feminist theories tend to look at the “origins, characteristics, and forms of gender inequality” (Peet & Hartwick, 2015, p. 269). The Feminist Political Ecology [FPE] perspective, is a feminist approach in relation to the concept of political ecology. Similar to the intersectional approach, Feminist Political Ecologists in turn:

“treat gender as a critical variable in shaping resource assess and control, interacting with class, race, ethnicity, and culture” in order to “shape the process of ecological change, the struggle of men and women to sustain ecologically viable livelihoods, and the prospects, of any community for sustainable development” (Rocheleau et al., 1996, p. 4).

Gender is still the main concept, however, there is a shift to an understanding how decision-making processes and practices in everyday life and the socio-political forces that come with this in turn influence the concept of environment. This can be done by looking at environmental issues, access to land, and who has control over certain resources (Rocheleau et al., 1996). The theory shifts the perspective from a gender only focus to a more agricultural and environmental focus helping to gain a better understanding of the smallholder farmers. As an analytical framework, “FPE sheds light on “local agency, recognizing the resourcefulness of marginalized women and men, often under significant socio-ecological constraints” (Assan et al., 2018, p. 13). This framework is used more and more these days and could be used as a key variable explaining how complex interactions shape access and control.

2.2 Access, Vulnerability and Adaptation

2.2.1 Access Framework

In addition to gender, feminist theories and a more intersectional perspective, this thesis uses the Access Framework [AF] to explore the power-relations within the farming family, and how different members have access to resources. This framework was created by Ribot and

Peluso. Access is defined as “the ability to benefit from things – including material objects, symbols, people and institutions” (Ribot & Peluso, 2003, p. 153). In short, access is about all the factors adding up to the different ways an individual can profit. The AF helps to explore who has access to certain resources, who has power over them, who distributes the power, and who can gain and lose from that access.

AF continues to focus on the concept of ability which “brings attention to a wider range of social relationships” and aims to show how people are “constrained or enables” to benefit from resources (Ribot & Peluso, 2003, p. 154). Access relationships are shown by mapping “dynamic processes and relationships of access to resources” (Ribot & Peluso, 2003, p. 154). This shows who potentially benefits and who does not. But access also depends on the social relations of the individual and these can shift from time to time. Moreover, the social relations change “depending on a person’s or group position and power within those social relationships” (Ribot & Peluso, 2003, p. 158). Access retains an empirical “focus on the issues of who does (and who does not) get to use what, in what ways, and when (that is, in what circumstances)” (Neale 1998, p. 48 in Ribot & Peluso, 2003, p. 154).

Within access to natural resources, there are many different ranges of power that are “embodied in” and “exercised through” different social, cultural, and other types of relations and processes (Ribot & Peluso, p. 155). In addition, the chances of people gaining access, control and eventually benefit from the access is culturally, socially and politically bound. These frames are also called “bundles of power” that “configure resource access” (Ribot & Peluso, 2003, p. 154). For example, certain individuals or larger communities/institutions have “control resource access,” and others should “maintain their access through those who have control” (Ribot & Peluso, p. 154).

As stated by Ribot & Peluso, AF:

“can be focused on the policy environments that enable and disable different actors to gain, maintain, or control resource access or the micro-dynamics of who benefits from resources and how” (p. 173).

After the CVC has affected the daily agricultural productivity, the access to certain resources could shift and lead to different power dynamics within the intersectional structure of the smallholder family structure. The framework helps to understand which individuals have access and benefit from the control and who loses and who gains. It is about the power-relations and potential conflicts that arise.

2.2.2 Social Vulnerability

Besides feminist theories, and AF, it is important to understand the exposure of individuals to CVC. This is done by looking at a concept called Social Vulnerability [SV], which is described as the “exposure of people to stress as a result of the impacts of environmental change, which encompasses disruption to livelihoods and loss of security” (Adger et al, 2001). SV focusses on the social aspects of the concept vulnerability.

The concept was first defined through analysis to famine and hazards and explains the state of individuals and societies coping with variability and stress (Adger, 1999). The concept is different in every context, but causes are found in environmental threats that in turn influence

the institutional and economic context. SV can also be used to describe CVC. In this case, stress from the CVC leads to forced adaptation to the changing physical environment (Chambers, 1989). Social vulnerability is place and time dependent. SV is impacted and impacts “economic aspects of livelihood and land use,” and “power relations and political dimensions” (Adger, 1999: p. 251).

Vulnerability is related to environmental and physical threats. But it is also a social condition shaped by the power structures in place, going back to the gender theories and the AF, the economic and institutional factors, “land use patterns, agriculture and forestry policies, and the distribution of productive resources” (Chaudhry & Ruyschaert, 2008: p. 6). In turn, vulnerability can be viewed as “a set of entitlements” and the “structure of these entitlements underpin both security and vulnerability (Adger in Chaudhry & Ruyschaert 2008).

Vulnerability can either be individual and collective and the two are interlinked as seen in Table 1 below. Whereas individual vulnerability is determined by first the “social status of the individual or household within a community,” and secondly “the access to resources and the diversity of income sources” (Adger, 1999, p. 252). For a farming community the exposure to CVC and disruption of daily routines could result in less income, and in turn reflect on their social status within the community. In order to remain stable, forced adaptation to the changing environment is necessary. Which could either relate to different types of farming techniques or in the more extreme situation, out-migration of one of the household members. At the local and individual level, the main indicator of vulnerability is resource dependency and poverty. This type of vulnerability means “involving the ability of an individual, family, group or community to use resources which are directly required to secure a livelihood. Access to those resources is always based on social and economic relations” (Blaikie et al., 1994, p. 48). In addition, access to resources is held in place by rights and responsibilities that might change and shift over time.

Collective vulnerability of a nation, region or community includes the power structures and hierarchies. Examples of these are the institution and market structures such as “the prevalence of informal and formal social security and insurance, and by infrastructure and income” (Adger, 1999, p. 252). Vulnerability to CVC and climate extremes are determined by the institutional arrangements that would help provide warnings, planning, shelters, alternatives, and security. At the institutional level, the main indicators of vulnerability are inequality and institutional adaptation.

Table 1. *Collective and individual vulnerability to climate change: determinants and indicators*

Type of vulnerability	Causes in relation to climate extremes	Indicators of vulnerability
Individual vulnerability	Relative and absolute poverty; entitlement failure; resource dependency	Poverty indices; proportion of income dependent on risky resources; dependency and stability
Collective vulnerability	Absolute levels of infrastructure, development; institutional and political factors – insurance and formal and informal social security	GDP per capita; relative inequality; qualitative indicators of institutional arrangements

Table 1: retrieved from Adger (1999): the individual and collective vulnerabilities in relation to climate change with its determinants and indicators (p. 252)

SV is related to the FPE and the AF because having access to a resource determines the amount of vulnerability and resilience one faces. In addition, the position one has in society and the power that comes with this will also determine the amount of vulnerability one receives over time. The influence of CVC will in turn generally most affect the poorest, weakest and most marginalized the most, making them more vulnerable.

2.2.3 Adaptation Strategies

After looking at the situation by using the gender theories, FPE, AF and the impact of stress by looking at SV, it is important to see how these individuals or communities are able to handle the impact of CVC through adaptation strategies. There has been research into the factors that influence adaptation to CVC in the past years with a focus on agriculture (Apatha et al., 2009; Deressa et al., 2009; Below et al., 2012; Bryant et al., 2000; Le Dang et al., 2014). However, the concept of adaptation is complex because it consists of many elements including “the characteristics of stress, the characteristics of systems, scales and adaptive responses” (Bryant et al., 2000). Stress in this case refers to the impacts of CVC that influence the farming systems (Bryant et al, 2000). The characteristics of stress is prominent because CVC fosters a reaction of the farmers. Another word for stress is ‘climatic disturbance.’ The latent can be either long term (changes in climate variables) or short term (e.g. types, magnitude, and frequency) with regard to climate events (Smithers & Smith, 1997).

The concept of adaptation was defined by the IPCC⁶ in the year 2007 as “an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (Beckman, 2011, p. 33). ‘Adaptive Capacity’ [AC] in turn, moves the focus to a need for “continuous flexibility and risk management, rather than looking for solutions” (Beckman, 2011, p. 34). Within households, adaptation strategies turn to various sources of security (Thomalla et al, 2006). In the case of farmers, this could include a focus on external sources in order to gain a bit more income. Many different types of adaptation strategies have been researched throughout the Global South. These strategies can influence many different scales ranging from the individual, regional, national or global (Bryant et al, 2000).

Adaptation is reflected in the previous three concepts as well. Adaptation and AC determines who is successful or not and why this is the case. Being able to adapt will reflect the social position of the smallholder farmers, and in turn decrease potential vulnerabilities. Having access and more power could in turn lead to more adaptation strategies and opportunities for resilience building. Together with the other frameworks and concepts these as a whole provide the backbone for the current research.

Chapter 3: Methodologies

Based on the theoretical framework, the concepts of gender, FPE, AF, SC and AC are used to structure the research questions. In turn these contribute to fully utilizing the relation of CVC to agricultural smallholder farmers. The following section will define the research questions,

⁶ Intergovernmental Panel on Climate Change

the original methodological design followed by the new and current methodology, limitations, and ends with the operationalization of concepts.

Research Questions

Main Research Question:

How does climate variability and change impact smallholder farmers' gender dynamics from the perspective of vulnerability and adaptive capacity in the Global South?

Sub-Questions:

1. What are the impacts of CVC on smallholder agriculture?
2. What is the importance of smallholder women in agriculture production compare to men?
3. What are the traditional gendered roles and tasks in agriculture and how did this change with CVC?
4. Which gender is most vulnerable in regard to CVC and why?
5. Which genders have the lowest accesses to CVC adaptation strategies?
6. How are different gendered farmers represented and included in policies?

3.1 Original Methodology Set Up

The original thesis was supposed to be conducted in the village of Hương Thủy town, just outside of Hue city, Viet Nam. Additionally, rice farmers would be surveyed, interviewed and observed. Because of the global pandemic COVID-19 the fieldwork came to an abrupt stop and only six weeks were spent abroad instead of 13. The section is found in Appendix A and shortly explains the initial intention of the current research before the corona situation. Some observations and photographs while driving through the town multiple times are available in Appendix B. Additionally, some observations made about the situation of COVID-19 in Viet Nam can be found Appendix C.

Accordingly, changes were made to the research. The possibility of conducting surveys with the help of students and supervisors at the University of Hue remained. On May 25th the final survey was shortened and spread to the researchers in Viet Nam, but no further response was received, so on June 8th the researcher decided to not wait in uncertainty anymore and cancel the survey. Since Viet Nam was still on lockdown throughout March, April, and the beginning of May alternative options for the thesis were already established. A SLR seemed to be the key, as this provides a transparent but thorough generalization of many articles, journals and literature written on a certain topic. In addition, instead of only focusing on rice farmers, the topic shifted more towards women in agriculture, keeping the impact of CVC and gender at the core of the research. Moreover, instead of solely focusing on Viet Nam and the Hue region, the current research extends countries in the broader Global South in order to get a more general overview of smallholder farmers, gender, CVC and adaptive capacities.

3.2 Current Methodology

In the following section the methodology of the current research will be presented. Before conducting the SLR however, thorough research was conducted on the topic of gender and CVC vulnerability, gendered adaptation practices, climate change adaptation techniques, with a specific focus on the context of South-East Asia and Viet Nam and rice production specifically. In order to provide a more specific example, the rice sector in Viet Nam is therefore used in the end of the result section in chapter 9.

3.2.1 A Systematic Literature Review

In the context of international development research and academia, the SLR a relatively new concept but has rapidly grown since 2009 (Mallett, 2002; White & Waddington, 2012). Many international development policies in the past were based on anecdote and cherry-picking strategies and therefore lowering the “evidence bar” (White & Waddington, 2012, p. 351). Therefore, in this thesis, the SLR will be used as it examines many journals and articles covering the same topic in order to understand the broad context and aims to collect all available evidence. Through the collection of all available evidence that could answer the research question, the concept of cherry-picking is avoided, and a more transparent general overview is created. The SLR aims to lay out all existing evidence in available literature on a distinct topic in order to understand the reliability, the detail and all knowledge on the topic.

The SLR process involves a strict procedure, that will be elaborated on in the inclusion and exclusion section. The SLR that aims to avoid biases, to exclude irrelevant literature, to include all available journals, and a quality assessment with the aim to reach an unbiased conclusion through a transparent process. Therefore, the evidence will be reviewed and synthesized by quantity and quality in order to “assess the extent to which generalizable statements can be made” (White & Waddington, 2012, p. 352). A SLR consists of:

- I. Well-defined research question(s);
- II. A clear-cut search strategy;
- III. Explicit inclusion and exclusion criteria (regard to selecting literature);
- IV. “systematic coding and critical appraisal” of included literature;
- V. A detailed and systematic synthesis of the results (possible meta-analysis if applicable) (White & Waddington, 2012, p. 354).

3.2.2 Relevance of Systematic Literature Review

As stated in the introduction, a SLR is relevant in the current study since the majority of articles often focus on context specific gendered dynamics. The importance of having a gendered lens in agriculture is slowly becoming the norm within policies and development strategies, however, tend to still be lacking. The ‘gender-blindness’ of many policies today could seem appalling since the important role of women cultivators was recognized by the UN and other international organizations in the early 70s.

The SLR can be used to shift from a mostly male-centered perspective to a more inclusive and intersectional perspective. There is already extensive research about the impact of CVC on smallholder farmers in specific contexts, therefore a SLR could help to include all aspects and information from different contexts in order to see the larger picture. Additionally, SLRs are in “high demand” among the field of international development for policy makers so could potentially add something to the existing SLRs (White & Waddington, 2012, p. 351). The thorough synthesis of existing evidence from literature seen “from multiple contexts and populations” made from those are important in international development to create “generalizable conclusions” (White & Waddington, 2012, p. 351). Finally, SLR can help ensure that policies gain enough information about existing literature without being cherry-picked.

3.3 Research Limitations

The limits of the current research were firstly time. It could have been possible to study more articles in detail if less time was spent on focusing on the intentional research. In that case,

the author would have time to understand other databases as Web of Science in order to gain a more comprehensive set of data. Moreover, another limit was the instability and uncertainty of doing primary research, and surveys, in Viet Nam until the end of June. But due to COVID-19 plans changed and a systematic literature review deemed to be the best solution. However, correspondence with the Vietnamese supervisors was timely and the uncertainty of successfully executing surveys or not remained for a long time.

Besides the uncertainty, the current researcher aimed to keep as many original questions as possible, in order to generate a general overview of the smallholder farmers and their CVC situations with gender. Focusing on one or two sub-questions would be enough for a SLR to go into more depth and detail. Now the questions were quite overlapping and focusing on less could lead to a more comprehensive focus. Finally, in section 10.2 the critique on oversimplifications will be discussed, the current thesis also focused on some of these simplifications since many of the articles did.

3.3.1 Constraints of Systematic Literature Review

In theory the SLR sounds almost too good to be true, however practically it is not as perfect. The process is very resource intensive, taking a substantial amount of time and energy. It is hard for a single researcher to stay consistent and objective all the time. In addition, there are many unclear titles or journals, or abstracts, and in the Global South the data and literature might be beyond the academic peer reviewed journals, meaning researchers have to hand-search other websites and go off the grid (Mallett, 2012).

Additionally, not all articles were available on the used data bases. In addition, not all articles include the relevant data, therefore after reading the abstract they could be included in the final count, but after reading the whole paper deemed irrelevant (Kitchenham & Charters, 2007). Another disadvantage is that SLR “require considerably more effort than traditional literature reviews” (Kitchenham & Charters, 2007, p. 4). Even if very objective and rigorous it is not always possible to identify every relevant study. This in turn means that “subsequent conclusions may only partially reflect the true evidence base” (Mallett, 2012). However, this SLR tries to acknowledge the constraints and limitations in order to become more objective and aims to present a compact summary of related articles surrounding a single topic.

3.3.2 Positionality of Researcher

The positionality of the researcher also plays a role, since not all data was accessible, there could be articles left out that deemed important. The search terms were hand-picked and could have been more detailed. More search engines could have been used that the researcher was unaware of. Only English spoken articles were sought after. The western positionality of the researcher might also add to the view of women’s importance without acknowledging that giving women more power can lead to social and cultural difficulties which can in turn lead to biases.

3.4 Selection Process

Studies were selected by a six-step procedure or selection process. The research protocol is important to establish before researching in order to create a consensus and can “serve as a road map” towards the final results and analysis (Okoli & Schabram, 2010, p. 16). The following section focusses on the inclusion and exclusion process.

The first step is to develop a clear research question and sub-questions. The second step was to decide which data bases to use. Google Scholar, Jstor, and Scopus were most accessible and relevant in the current scenario. For these platforms, access was granted through the Utrecht University Library. The third step was to compile all relevant search terms together and run tests to see how beneficial these search results were as shown in table 2. An initial run through Google Scholar, Jstor and Scopus revealed that the words (gender) dimensions, (gender) role were not as successful and keeping just the word gender would be sufficient. These words were hence left out in the following searches.

First run of search terms	Second run of search terms (changed to)
<i>climate change gender role farmer</i> <i>Climate change and gender role</i> <i>gender dimensions climate change</i> <i>Women/gender in agriculture</i> <i>Rice and climate change</i> <i>Farmer and Climate change</i>	<i>Climate change and gender</i> <i>Climate change and gender</i> <i>Gender and climate change</i> <i>Women in agriculture</i> <i>New:</i> <i>gender in agriculture</i> <i>farmers</i> <i>rural</i>

Table 2: Search terms used to find articles in two steps

The study is investigating how CVC may impact different genders in the context of smallholder farmers in the Global South. Since the CVC is not gender neutral and could potentially have different repercussions in distinct contexts, it is important to keep search terms as broad as possible. Therefore, in order to keep the scope broad, a variety of search engines were used combined with clear and straightforward search terms. In addition, the sometimes-overlapping search terms avoided missing out on any literature.

After searching with the first search terms, the irrelevant words were left out and the second search terms were used. However, the 10 articles found remained. With these relevant search terms as presented in the table 3 below, the fourth step was to continue scanning for literature. This was mostly done by looking at the titles and reading abstracts. The inaccessible articles were also written down in order to keep track of the number of journals found.

Search term & data base	Amount found and relevant
Google Scholar <i>climate change rice and gender role</i>	9
Jstor <i>climate change rice and gender role</i>	4
Google Scholar <i>gender climate change</i>	12
Jstor <i>gender climate change</i>	2
Google Scholar <i>Women in agriculture</i>	8
Google scholar <i>Gender in agriculture</i>	9
Scopus: (<i>gender</i> AND <i>agriculture</i> AND <i>climate</i> AND <i>change</i>) AND (LIMIT-TO (<i>ACCESSTYPE(OA)</i>))	12
	Total: 56

Table 3: Search terms and relevant articles found

3.4.1 Classification of Relevant Articles

Step five involved the classification criteria as presented in table 4 below. After concluding the accessible and inaccessible amount of peer reviewed journals and the quality assessment criteria below, the left-over articles' abstracts and conclusions were studied. The abstract contains the key information of the journal, and includes the research design, methodology and results. Only academically conducted studies were used in the SLR, however some of the non-academically conducted studies were used throughout the theoretical overview and background of this thesis.

The articles should not be older than 2000 since CVC has changed dramatically in the recent years (Agarwal, 2011; Echeverria, 2020; Lambrou et al., 2006; Wrigley-Asante, 2019). Articles published more than 20 years ago seem outdated in relation to agriculture and gender. If the inclusion criteria is not met, the articles cannot be included.

Inclusion Criteria	
I.	The article is written in the English-language
II.	Not published before 2000
III.	The article answers one of the (sub) questions
IV.	Focus on the Global South
V.	The study should not be a duplication of another article
VI.	The study should concern climate change and gender in more than one research phase
VII.	Academically peer reviewed journal
If not peer reviewed the article should still meet criteria above plus:	
I.	There must be a high-quality evidence-based part
II.	Statements should overlap with peer-reviewed data
III.	The research should be presented with transparency
IV.	References should be transparent and accessible
V.	Articles that are quoted in in peer-reviewed journals

Table 4: The criteria articles needed to accommodate (quality assessment)

Step six was to read all articles, to see if they are still relevant and to certain sub-questions and make a systematic scheme in order to find these criteria back. Moreover, the articles were read and studied completely in order to understand the empirical data and list the relevant topic, which question could be answered, and the search terms used. This was written down in a systematic way as seen in Appendix C. In figure 2 below the selection process is shown in more detail.

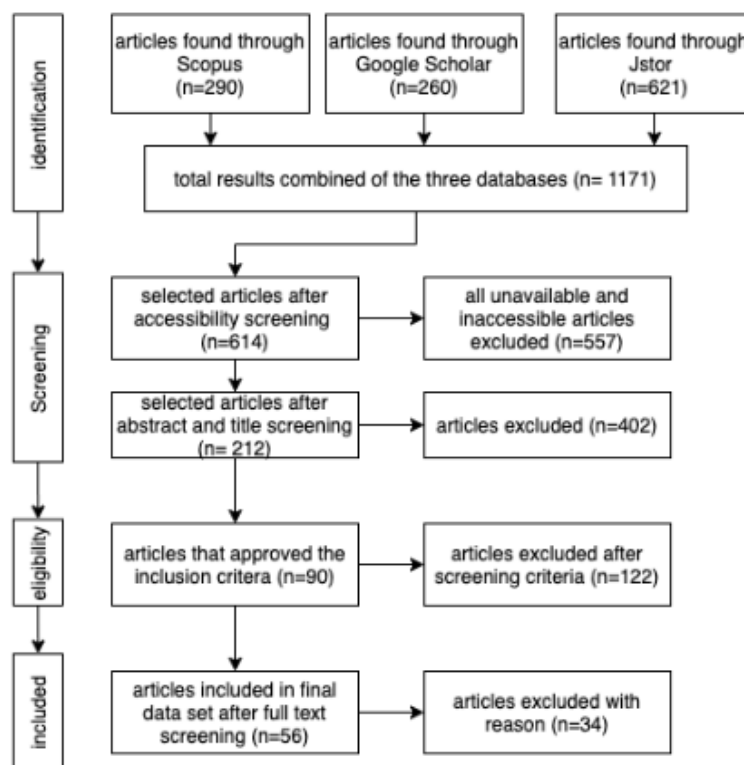


Figure 2: Flow Diagram of included and excluded literature for the SLR (Original idea from Hatab 2019, p. 283)

3.5 Study Settings

Of the 56 studies, 14 reported findings from the African continent, 13 from Asia, 6 from Latin America and 23 studies reported data and findings from all over the Global South as shown in the table 5 below. The majority of studies focused on multiple countries across the Africa and Asia. Notably, even after a thorough search, not as many studies were found on Latin America. It is not surprising, that most articles were found with regard to the African continent, since smallholder farmers have been deeply impacted by CVC over the past years, especially SSA is seen as the most vulnerable region (Okonya et al., 2013). In addition, previous research found that the “highest proportion of smallholder farmers are found in Africa,” followed by Asia and the Caribbean whereas the lowest number was found in Latin America (Momsen, 2019, p. 147; Denton, 2004; Raney et al., 2011). Moreover, the most vulnerable and impacted place by CVC, SSA, also accounts for most women actively engaged in agricultural activities, which consists of 80 percent of all women (Denton, 2004, p. 44).

Continent	Reference
Africa Total = 14	Ihalainen & Sijapati Basnett (2015) Denton (2004) Mlambo-Ngcuka (2015) Steady (2014) Lawson et al., (2017) Carranza & Niles (2019) Ylipaa et al., (2019) Wrigley-Asante et al., (2019) Adzawla et al., (2019) Assan et al. (2018) Mersha & Van Laerhoven (2018) Nelson & stathers (2009) Okonya et al., (2013) Peterman, Behrman, & Quisumbing (2014)

Asia Total = 13	Chi & Anh et al., (2015) Gallina & Farnworth (2016) Jha (2004) Rola-Rubzen (2010) Romero-Paris (2004) Akter et al., (2017) Tamang et al., (2014) Kelkar (2009) Chi et al., (2010) Chanana-Nag & Aggarwal (2018) Ravera et al., (2016) Huynh & Resurreccion (2014) Sultana (2014)
Latin America Total = 6	Echeverria (2020) P. Escobar et al., (2008) Arora et al., (2017) Gumucio & Rueda (2015) Kay (2015) Boyd (2002)
All over the developing world Total = 23	Momsen (2019) Terry (2009) Dankelman (2002) Nelson et al., (2002) Jost et al., (2016) Agarwal (2011) MacGregor (2010) Roehr (2007) Lambrou & Paina (2006) Fletschner & Kenney (2014) Alkire et al., (2013) Doss et al., (2018) Raney et al., (2011) Doss, (2014) Anderson & Sriram (2019) Call & Sellers (2019) Huyer, (2016) Kaijser & Kronsell (2014) Carr & Thompson (2014) Sundström & Mcright (2014) Pearse (2017) Kristjanso et al., (2017) Behrman, Bryan, & Goh (2014)

Table 5: Articles with their research scope by continent

3.5.1 Methodological Approaches

The majority (57%) of the articles cover a literature review and analysis of existing literature or policy documents together with primary research from all over the Global South. Many examine existing policy documents, policy briefs, previous research and specific case studies that examine the potentially changing role of smallholder women in agriculture.

The other articles focus on more primary data. A mixed methods approach, including interviews, (household/field) surveys, geographic information system [GIS] methods, Focus Group Discussions [FGDs] and key informant interviews, concluded to be 21 percent. The third largest methodological approach was a qualitative one with mainly semi-structured interviews and FGDs consisting of 15 percent. The smallest percentage of 7 percent was a quantitative approach that included mostly household and field surveys of the areas under research and a few used remote sensing or GIS techniques from data extraction.

3.5.2 Focus of Articles

Only three articles out of 56 did not specifically focus on the divergence between smallholder farmers women, men or their intersectional differences. Moreover, only one article does not cover the effects of women in agriculture due to CVC. All other articles focus on the environmental changes happening within the agricultural or environmental sector and how gendered positions and women’s roles shift within the sector. Many articles do this through the concepts of access, vulnerability, gender roles, and changes in agricultural tasks.

3.6 Operationalization of Variables

The following section focusses on the concepts from the theoretical framework and explains what specific concepts were looked for throughout the SLR. More detailed information for the search specific terms, themes answered, and relevant topics is found in the analysis scheme in Appendix D.

3.6.1 Operationalization of Gender

Operationalization of Gender	Intersectional-intra household dynamics
	(Gendered) responsibilities
	(Gendered) roles on farm
	Access to resources and adaptation strategies

Table 6: Gendered Resource Tenure (adapted from Rocheleau, 1996, p. 11 and FAO, 2007)

The concept of gender will be researched and taken into account by looking at an intersectional perspective of genders. In this case, the distinction between gender, generation, roles, responsibilities, access, and strategies are taken into account and acknowledged throughout the research.

3.6.2 Operationalization of Access Framework

Access to Capital	Wealth, finances, equipment translates to status and power and can be used to control the resources
Access to Knowledge	“Beliefs,” “ideological controls,” “discursive practice,” and “negotiated systems of meaning” (p. 170)
Access through social identity	Membership of community or group, including “age, gender, ethnicity, religion, status, profession, place of birth, and education” (p. 171)

Table 7: Mechanisms to Measure Access: who benefits (Ribot & Peluso, 2003; Blaikie, 1985)

In order to “map” the “dynamic processes and relationships of access” these three accesses are focused on (Ribot & Peluso, 2003, 153). These three will illustrate how access is shaped, how benefits are gained, controlled and maintained. The researcher hopes to gain insight into which member of the smallholder household (social identity) has more access than others or if the distribution is divided equally. Moreover, to see if farmers have access to resources that can prevent further CVC intrusion, who has access to these, and how access is shaped, gained and controlled.

3.6.3 Operationalization of Vulnerability

Exposure to stress
Sensitivity to climate change
Individual or collective vulnerability

Table 8: Operationalization of Vulnerability (Adger, 1999; Chaudhry & Ruyschaert, 2008)

Vulnerability as a variable focusses on how farmers are vulnerable to climate change and their perception of climate change. Vulnerability and adaptation are often intertwined. This

will be done by focusing on the kind of problems farmers face and how these could be further accelerated by CVC.

3.6.4 Operationalization of Adaptation

Characteristics of stress
Adaptive Capacity
Drivers behind adaptation

Table 9: Adaptive Measures (Byrant et al, 2000; Smithers & Smith, 1997)

Adaptation to CVC is a broad concept and can range from agricultural changes, for example diversification of crops, out-migration, to shifts in household dynamics and finding other external income sources. The adaptive capacity will depend on the farmer and their community, the vulnerability level and the accesses available.

Research Findings

The results are divided into 5 sections that overlap and discuss the overall findings and the findings per continent (Africa, Asia, Latin America) if deemed relevant as outlined in table 11 below. The critique sections throughout the findings are the authors own insights and interpretation's and most critique is found in the discussion. Chapter 9 includes a specific case study from Viet Nam and the rice sector.

<i>Findings Sections</i>	<i>Sub-questions</i>	<i>Chapter Number</i>
<i>1. General section on Climate Change</i>	1. What are the impacts of CVC on smallholder agriculture?	Chapter 4
<i>2. Importance of gendered smallholder farmers</i>	2. What is the importance of smallholder women in agriculture production?	Chapter 5
<i>3. Traditional Gendered Farm Roles and CVC</i>	3. What are the traditional gendered roles and tasks in agriculture and how did this change with climate change?	Chapter 6
<i>4. Vulnerability and Access to adaptation strategies</i>	4. Which gender is most vulnerable in regard to CVC and why?	Chapter 7
	5. Which genders tend to have the lowest access to CVC adaptation strategies?	Chapter 7
<i>5. Representation in Policies</i>	6. How are different gendered farmers represented and included in policies?	Chapter 8

Table 10: The structure of the result section

Chapter 4 General: Climate Change and Smallholder Farmers

1. What are the impacts of climate change on smallholder agriculture?

The following section focusses on general background of CVC on smallholder farmers and the agricultural sector in general. This part uses more articles to provide a more general and detailed overview before delving into the SLR. But out of 56 articles, 17 discussed changing climate patterns and their effects on agriculture smallholder farmers decides focusing on gender.

4.1 Climate Variation and Change

The change of climates on earth together with global warming have been known for decades. CVC is not a new concept and has been implemented and taken into consideration in for example the SDG₇ created by the UN and many other national policy documents in order to protect the most vulnerable people. One group of vulnerable people are the smallholder farmers and the agricultural sector.

4.1.1 Adverse Climatic Effects

CVC effect on Farmers	Consequences	References
1. Shorter and more unpredictable rainfall	<ul style="list-style-type: none"> ▪ Influence crop/food production <ul style="list-style-type: none"> ➤ Drying out crops ➤ Overflowing fields ➤ Wipe out crops ▪ Water-shortages ▪ Water related natural hazards; floods/cyclones 	Assan et al., 2018; Nelson & Stathers, 2009; Chi et al., 2010; Dankelman, 2002; Lawson et al., 2017; Sultana, 2014; Wrigley-Asante et al., 2019
2. Droughts	<ul style="list-style-type: none"> ▪ Increase field erosion ▪ Dry out crops ▪ Influxes of water scarcity 	Nelson et al., 2002, Okonya et al., 2013; Lawson et al., 2017; Rola-Rubzen, 2010
3. Extreme winds and storms	<ul style="list-style-type: none"> ▪ “blow all year round due to loss of vegetation cover” (Nelson & Stathers, 2009, p. 85) ▪ These winds blow the “rain clouds across the sky without letting them rain” creating more “intense sunshine” and in turn more heat (Nelson & Stathers, 2009, p. 85). 	Nelson & Stathers, 2009
4. Decreasing soil fertility	<ul style="list-style-type: none"> ▪ Decline in crop production ▪ Less nutrients in soil 	Assan et al., 2018
5. Increased temperatures	<ul style="list-style-type: none"> ▪ Often combined with rising Sea Levels ▪ Destruction of soil and crops ▪ Water scarcity 	Call & Sellers, 2019; Dankelman, 2002; Jost et al., 2016; Momsen 2019; Rola-Rubzen, 2010
6. Rising sea levels	<ul style="list-style-type: none"> ▪ Salt kills crops ▪ Spread of waterborne diseases ▪ Lowlands are prone to flooding 	Call & Sellers, 2019; Dankelman, 2002; Jost et al., 2016; Momsen 2019; Rola-Rubzen, 2010

Box 1: CVC Effects and Consequences for Smallholder Farmers

In box 1 above are the adverse climate effects of man-induced CVC. For smallholder farmers the above are hard to deal with because they often lack the resources and accesses to become

climate resilient. Furthermore, Farmers are not only vulnerable to the changing events but also the shocks following these events in the months to come, for example floods after heavy rainfall (Wrigley-Asante et al., 2019). All of the effects of CVC can become aggravated over time.

Not part of the effects, but a serious challenge is the increased the number of insects due to CVC. The use of fertilizers could mitigate the impact of insects, but these are expensive and smallholder farmers have limited access to these (Harvey et al., 2014). In addition, there is already an increase in pests and diseases, for either the livestock or the crops itself, and this is anticipated to only increase in the upcoming years (Nelson & Stathers, 2009).

The increase of CVC also raises the chance of “supply water being contaminated” and “decrease of biomass fuel available per household” (Steady 2014). More drought and sea level rising, there is less farmland, meaning a reduction of crop yields and a reduction of areas for the livestock to graze (Nelson & Stathers 2009). The unpredictability of changing weather patterns also adds to the changes in crop growing periods, potentially burdening the farmers with more and longer work (Lawson et al., 2017).

4.1.2 General Impact of CVC on Smallholder Farmers

CVC is impacting many farmers around the world. Compared to larger agricultural mass production farms, many of the smallholder farmers tend to have less capacity to adapt and recover from the changing climate and more extreme weather patterns compared to larger companies and farms (Call & Sellers, 2019; Nelson & Stathers, 2009). Even if the effects of CVC depend on the geographical context and vary per region, the poorest farmers, often small farmers, are most vulnerable (Jost et al., 2016; Djoudi & Brockhaus 2011). Others state that the most vulnerable are women (Djoudi & Brockhaus 2011). These smallholder farmers in the Global South experienced unpredictable weather patterns and increasing extreme weather patterns for the past decades and this is only likely to increase even more in the future (IPCC, 2013; Vermeulen, Aggarwala, et al., 2012; Vermeulen, Campbell, & Ingram, 2012 in Jost et al., 2016; Momsen, 2019).

In addition, because of changing climate patterns throughout the seasons, the farmers experience food insecurity, income loss, and “are intrinsically vulnerable to any shocks that affect their agricultural systems” (Harvey et al., 2014, p. 7). They often have limited resources, capabilities and a lower climate resilience to recover from CVC related events. For example, in many African countries, the smallholder farmers lack good housing, electricity, and clean water (Harvey et al., 2014). Not all farmers lack electricity and clean water, but the living conditions will be intrinsically worse than on larger scale farms that have more capacity and capabilities to adapt to climate related risks. Additionally, with the rise of CVC, the lack of resources to gain access to better mechanization strategies can influence the lack of irrigation, especially during a drought. According to Call and Sellers, “rainfed agriculture” is in many regions the prevailing agricultural technique used by smallholder farmers but the use of “fertilizer, mechanization, and hybrid seeds” remain low hand in hand with agricultural productivity because of CVC (2019, p. 3).

The extreme weather patterns can create problems for short term and long-term agricultural production. Adjusting farm practices is often a struggle for many smallholder farmers, and

the projected climatic changes on agriculture will “require that farmers undertake adaptation and coping strategies to minimize their vulnerability to the impacts” (Assan et al., 2018, p. 3).

4.1.3 SSA: One of The Most Affected Regions

One of the most affected and vulnerable areas by the decreased rainfall patterns and drought is SSA due to high reliance on “rainfed agriculture” for “food security, economic growth and entrenched poverty” (Okonya et al., 2013, p. 252). The more extreme climatic events as more dry seasons, floods, storms all increased in the past 10 years in this region (Okonya et al., 2013). This is an area with many SHF and the increase of CVC with a focus on irregular rainfall and increased drought can be devastating for farmers but also the local communities that depend on their produce as a main source of food security. Here many smallholder farmers have hard times adapting to the changes because “unavailable markets,” “high input costs,” and “a lack of infrastructure” to secure their resilience and livelihoods (Assan et al., 2018, p. 3).

4.2 CVC and Gender

In box 2, the overlapping effects of CVC and gender are shown. It is worth noting that not every gendered experience of CVC puts women at a disadvantage, but in many situations, they are “likely to experience disproportionate negative effects” compared to men (Argarwal, 1994 and Cornwall; 2002 in Bhattarai et al., 2015, p. 122). Moreover, a recent IPCC report stated the importance of CVC and societal variables including, “race, class, gender, ethnicity” and recognizes that “people who are socially, culturally, politically, economically, institutionally, or otherwise marginalized in society are often highly vulnerable” to CVC (IPCC, 2014, p. 7 in Bhattarai et al., 2015, p. 122). In Tanzania for example, the status of married, unmarried, divorced, and widowed have “different barriers” and “opportunities” in adapting to CVC for both females and males (Van Aelst & Holvoet, 2016, p. 48). The following sections will go into more depth about the interrelation between CVC and gender.

The Impact of Climate Change on Gender Dynamics from a Vulnerability and Adaptive Perspective

Concept	Gendered Consequences	Reference
Gendered experience of CVC (Question 3)	<ul style="list-style-type: none"> ▪ In many GS situations, due to social and cultural structures of power relations, women tend to face more negative effects of CVC. 	Aberman et al., 2015; Bhattarai et al., 2015; Djoudi & Brockhaus, 2011
Increased workloads and burdens (Question 3/question 4)	<ul style="list-style-type: none"> ▪ CVC impacts often leads to more workloads for SHF; in many cases this is an increased triple burden for women. ▪ Women's workloads tend to be heavier because of these additional agricultural commitments on top of domestic burdens. ▪ CVC increases scarcity of domestic natural resources (water/fuel/food). More time needed to collect this. 	Arora et al., 2017; Berhman et al., 2014; Bhattarai et al., 2015; Nelson & Stathers, 2009
Different perception of CVC	<ul style="list-style-type: none"> ▪ Genders face different perceptions of CVC since they are in charge of different agricultural tasks. 	Berhman et al., 2014; Ihalainen & Sijapati Basnett, 2015; Jost et al., 2016
Adaptive Capacity (Question 5)	<ul style="list-style-type: none"> ▪ Differs per individual/family since it depends on the available and accessible access. ▪ The AC also depends on the knowledge gained, through education and community meetings which are often not available for women. ▪ Women are more vulnerable in losing their assets because of widowhood, separation etc. ▪ Control over assets is influenced by gender. ▪ Social norms often hinder women from having the same levels of AC as men. 	Aberman et al., 2015; Behrman et al., 2014; Bhattarai et al., 2015; Djoudi & Brockhaus, 2011; Huyer, 2016; Jost et al., 2016; Van Aelst & Holvoet, 2016
Adaptive Responses (Question 5)	<ul style="list-style-type: none"> ▪ Gender plays a role in AC and adaptive responses. ▪ Out-migration of younger youth & men. ▪ The triple burden of ones left behind. ▪ Women can have different inputs in adaptive responses since they are often in charge of different tasks. 	Aberman et al., 2015; Arora et al., 2017; Bhattarai et al., 2015; Jost et al., 2016; Rola-Rubzen, 2010; Tamang et al., 2014
Policy Makers inclusiveness (Question 6)	<ul style="list-style-type: none"> ▪ Policy makers tend to mostly include the culturally seen farmers: men. ▪ Treat women as homogeneous. group: example: policies in Tanzania ▪ Women's representation could lead to better outcomes for more sustainable and resilient agricultural practices. ▪ Needs to be a recognition of marginalized farmers and their active roles. ▪ Gender norms exclude individuals from decision-making processes. 	Aberman et al., 2015; Huyer, 2016; Lambrou & Piana, 2006; Nelson & Stathers, 2009; Roehr, 2007; Van Aelst & Holvoet, 2016; Wrigley-Asante et al., 2019

Box 2: Interconnectedness of Gender and CVC

Chapter 5: Importance of Women in Agriculture

2. What is the importance of smallholder women in the agriculture sector?

Women and men experience CVC at different levels and different speed. It has been observed in various studies that “women tend to be more concerned with the environment than men” (Sundström & Mcright 2014, p. 1083). Therefore, all genders can have new and concrete insights into how to combat the effects of CVC and become more resilient. If one takes into account all the insights possible, the creation of a more thorough and better working plan and program are higher. 27 articles have been used in the following chapter.

5.1 Importance of Smallholder Women Cultivators

It is important to look at gender implications in terms of CVC research as many countries have patriarchal norms and values and adaptation is done from one particular perspective. In South Asia these gendered implications of CVC are “particularly poignant” since the “patriarchal norms, inequities, and inequalities” often disposition women and men in separate “positions in their abilities to respond to and cope with dramatic changes in socioecological relations” though “also foreground the complex ways in which social power relations operate in communal responses to adaptation strategies” (Sultana, 2014, p. 372). The activities of women within the agricultural sphere are still “characterized by a global gender gap in vulnerabilities, access to resources, and productivity” (Huyer, 2016, p. 105). Jha claims that, “men are no longer considered the sole economic providers of households.” “their contributions to households vary considerably across cultures” and “complement the income of women” (2004, p. 553). However, women, in many LIC but also throughout the rest of the world, are still considered “complementary yet subordinate to men” in both popular discourse and religion (Jha, 2004, p. 554).

5.1.1 Statistics on Women Farmers' Importance

Women are important for the global food security. According to Akter et al. “women’s empowerment is considered a ‘prerequisite’ to achieving global food security” (2017, p. 270). Furthermore, the following paragraphs gives statistics facts and percentages about the important role women have within the agricultural sector. It is debatable if these numbers are 100 percent accurate, but these do provide insights in how important women’s role is.

Some authors state that women produce 60 to 80 percent of the food in developing countries (Chi et al., 2010; Ihalainen & Sijapati Basnett, 2015, p. 8). Nonetheless, women cultivators only own “10 to 20 percent of the agricultural land” globally (Chi et al., 2010; Ihalainen & Sijapati Basnett, 2015, p. 8). Mlambo-Ngcuka emphasizes that “80 to 90 percent” of the smallholder farmers in Africa are made up of women (2015, p. 329). Denton agrees and states that “80 percent of women” in SSA are “actively engaged in agricultural activities” (2004, p. 44). It is noteworthy, that generally women in the Global South also carry the burden of domestic tasks additionally to the farm work. The agricultural sector in Asia is said to employ 60 percent of the “total female working population” (ILO 2016 in Chanana-Nag & Aggarwal, 2018, p. 22). Huyer agrees when stating that “80 percent of women in least developed countries” are employed in the agricultural sector and “60 percent of women in Southern Asia and SSA” (2016, p. 106).

Akter et al. and Raney et al. slightly disagree and found that women make up about “43 percent of the agricultural labor force” both “globally and in developing countries” (2017, p. 270; 2011, p. 1). Although it might be hard to both have 43 percent of farmer women globally and the exact same number of farmer women in developing countries, this is a number that is often used in policy documents, for example by the FAO and through these spread to many more development strategies.⁸ The number 43 percent according to Raney et al. has increased to some degree since the 1980s (2011). The authors state that today women farmers comprise around 20 percent in Latin American and 50 percent in Africa. Furthermore, the “global average is dominated by Asia” with China as a leading example of having women as economically stable farmers. See figure 3 for more detailed information on the different regions per continent from the developing world and their female share of farmers.

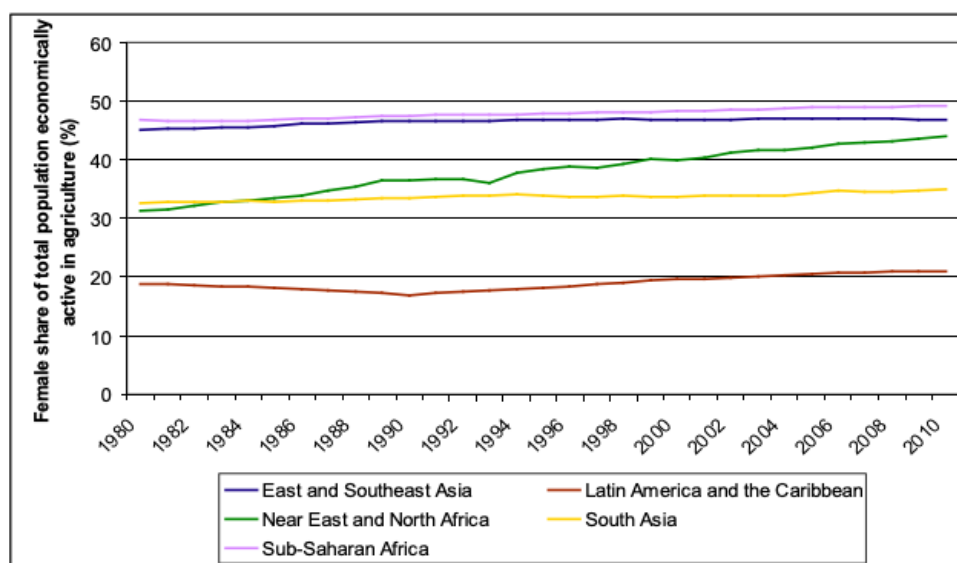


Figure 3: Female share of the agricultural labor force per developing region. Original source from FAOSTAT (Raney et al., 2011, p. 4).⁹

Raney et al. argues that the figure uses only “economically active in agriculture,” so includes individuals currently unemployed but “looking for work” within this sector. Meaning the concept is more comprehensive than employment in agriculture. Akter et al. continues and points out that women “produce over 50 percent of the world’s food” (Akter et al., 2017, p. 270). This statistic is quite likely since women in developing countries often are responsible for the subsistence food production for their surroundings.

Even if the percentages of women are high and their importance is acknowledging in CVC related issues and agricultural progress, within the Southern African part of the continent, only Lesotho has a women minister of agriculture (Mlambo-Ngcuka, 2015, p. 329). But within the Mafeteng area of Lesotho, women together with men work “to decline the risks of CVC” and both genders are “in the council and can make decisions” which can be an example to other regions (Mlambo-Ngcuka, 2015, p. 329).

⁸ <http://www.fao.org/gender/resources/infographics/the-female-face-of-farming/en/>

⁹ The data from the above focusses on the “female share of the agricultural labor force” that is calculated as “the total number of women economically active” within the agricultural sector “divided by the total population economically active in agriculture” (Raney et al., 2011, p. 4).

5.1.2 Critique of Statistics

Even the numbers above are repeated in various articles, policies and documents other authors state the precise amount varies. According to Doss it is insurmountable to accurately know the extent of women's farm work in developing countries, since smallholder farming is a family effort (2014). It is therefore hard to find the evidence for women producing "60 to 80 percent" of the food available within the emerging nations or that the latent are "responsible for half of the world's food production" (Doss, 2014, p. 7). Furthermore, Raney et al. also concludes that the chance of women producing "60 to 80 percent of food in developing countries" is "unlikely" since they generally "work together with males" and it differs per region (2011, p. 14). Additionally, the percentage of 60 to 80 was developed by the UN in the early 1970s, so is quite dated in 2020 almost 50 years later. Moreover, another point to consider is when doing research about the percentage of women farmers through asking about daily tasks, women in Latin America are "likely to reply that their home is their primary responsibility" even if they also help with the farm work (Doss, 2014, 7). However, it is fair to conclude that even if the statistics might differ, women do seem to hold a very crucial role within the agricultural sector.

5.2 Agents of Change

Women are not passive and are important agents of change (Adzawla et al., 2019; Sundström & Mccright 2014; Carvajal-Escobar et al., 2008; Wrigley-Asante et al., 2019). Moreover, the concept gender is "one of the most universal and important stratifying elements affecting natural resource use and vulnerability to the effects of CVC" (Call & Sellers, 2019, p. 2). Since women and men face different CVC shocks in both the short-term and long-term it is important to acknowledge how women can add insights how to become more CVC resilient.

Additionally, besides being important agents of change, women can be seen as "agents of innovation in response to climate-induced change (Denton, 2002 in Huyer, 2016, p. 108). The resilient tactics developed by these women through the environmental awareness are "valuable resources for recovery and adaptation" (Huyer, 2016, p. 108). Moreover, the latent can be active agents that have "developed locally adapted, appropriate and sustainable coping strategies and responses to climatic shocks" (Wrigley-Asante et al., 2019, p. n/a). Lastly, women can sometimes be more concerned with CVC related issues and the environment compared to men (Sundström & Mccright, 2014). This could mean women might have a large role to play developing strategies to mitigate CVC.

5.2.1 Indigenous Knowledge

Some articles discuss the indigenous knowledge women have of crops and changing climates (Nelson & Stathers, 2009; Steady, 2014; Terry, 2009). This knowledge is passed down generations and can involve around local resources and "farming that males often lack" (Steady, 2014, p. 314). These insights could be useful when mitigating the effects of CVC, as for example in some regions in African where indigenous knowledge helps to "support household food security" in droughts or famines (Nelson & Stathers, 2009, p. 84). Examples of these techniques are using "pest-tolerant plants," "seed selection to cover diverse conditions" throughout the growing season (Ramphela 2004, Eriksen 2005 and Easton & Roland 2000 in Nelson & Stathers, 2009, p. 84). Women's connection with nature is different than that of males is debatable, however, women often experience CVC related events from various perspectives and have other insights in how to become more resilient.

5.2.2 Women and New Solutions

Women have many diverse responsibilities within and outside the household and tend to seek solutions during changing climates. Their solutions often include to reduce factors as “lack of drinking water, access to health and education, and reducing vulnerability” for their direct surroundings and communities (Carvajal-Escobar et al., 2008, p. 278). Finding these solutions, the women are likely to share and establish female networks, increasing their social capital while spreading the new adaptation ideas (Carvajal-Escobar et al., 2008). Compared to men, women are often in “a better position to note certain environmental hazards” be it through their domestic activities or “professional development” (Carvajal-Escobar et al., 2008, p. 278).

5.2.3 Different Perception of CVC

Other researchers state that women tend to perceive and experience more climatic changes (Adzawla et al., 2019; Lawson et al., 2017). In a study by Adzawla et al. in Ghana they found that the female heads of farms tended to experience “severer impacts of CVC on their farms than other gender groups” (2019, n/a). This indicates that women managing a farm might be more aware and pay more attention to changing climatic patterns or see slightly different patterns than men. Another study in Ghana by Lawson et al in different districts showed: “women farmers between the ages of 31–50 years perceived more changes in temperature and rainfall compared to the other age groups” (2017, p. 448). Women in the agricultural field could “help bring about more sustainable” and resilient agricultural techniques (Lawson et al., 2017, p. 448).

5.2.4 Agricultural Sector’s Dependence on Women

In recent decades, more farmer males and sons leave the farms for the cities in order to find a higher income occupation to ensure for the livelihoods of their families (Chi et al., 2010; Huynh & Resurreccion, 2014; Ravera et al., 2016; Rola-Rubzen, 2010). When males out-migrate, women take over managing the farm, and the agricultural tasks left behind. If these women do not have the same access as men to natural resources and for example community meetings, their farm productivity will spiral downwards. But as Ravera et al. found in a research in the Indian Gangetic mid-plains, male out-migration in low caste households of Bihar resulted in higher involvement of women in the “agricultural workforce” as they become “the de facto head of the households” (2016, p. 338). Even if this transition is not always fully legal, they do become managers of their own household and farms.

Another reason why it is important to take women farmers into consideration and give them a voice is because they are often stuck within the agricultural sector. Meaning women are less likely to find occupations outside of the sector. Women remain “much more dependent on agriculture for survival” compared to male workers due to “their lesser access to non-farm jobs” (Agarwal, 2011, p. 5). For example, in Africa in the year 2008, “63 per cent of female workers” were involved in agriculture, whereas this number was 48 per cent for males (Agarwal, 2011, p. 5).

5.2.5 Influential Mothers

Another reason for the importance of including more women and giving them more authority in development and CVC projects and approaches is that they could have some influence

within the family. They are often found at home and taking care of the children, giving them a large authority over how these children are raised. They could influence the children's ideas and attitudes about sustainability and more climate resilient techniques in order to ensure future generations maintain the climatic stability. A study by Fletschner & Kenney about rural women in general found that if women gain more influence over their families' economic decisions, "their children are better fed and their families allocate more of their income to food, to health, education and children's clothing" (2014, p. 11). So, handing more authority and influence on women in the agricultural and the domestic sphere can potentially lead to better outcomes with regard to food security, health security and education for the future generations. Moreover, many development programs have studies carried out to look into the role women and girls play in combatting CVC, as through education, to make their attitudes more climate friendly.¹⁰

Chapter 6: Traditional Gendered Farm Roles and CVC

3. What are the traditional gendered roles and tasks in agriculture and how did this change with CVC?

6.1 Gendered Roles for Smallholder Farmers

Being a smallholder farmer in a middle- and lower-income country generally consists of a family business, with only occasionally additional hired laborers. In order to optimize production, many of the tasks and responsibilities are divided among the family members. For example, in Viet Nam and many South-East Asian nations, the yielding and production of rice is a family effort and business (Galina & Rozel Farnworth, 2016; Rola-Rubzen, 2010). From a feminist ecological perspective, one should view gender as the resources and accesses available to an individual that are interacting within social, cultural and racial spheres (Rocheleau et al., 1996). However, almost all articles found in the current research focus on the binary concept of gender, so male and female. This SLR will therefore use the binary concept of gender but acknowledges there is a wider range in regard to gender. The following section uses 37 articles to explain the gendered roles for smallholder farmers before and after CVC.

Throughout the past centuries, the roles and responsibilities of farming have shifted into gendered roles. These are often based on social and cultural norms (Chi et al., 2010; Romero-Paris, 2014; Galina & Rozel Farnworth, 2016; Tamang et al., 2014; Ylipaa et al., 2019; Mersha & Van Laerhoven, 2016). The roles and responsibilities are ingrained deep within cultures and normalized. In many cultures, the word farmer is associated with 'he,' as in Ethiopia for example (Mersha & Van Laerhoven, 2016, p. 1708). The association with a male farmer leads to a taboo against women doing certain tasks on the field, like ploughing and other manual tasks, "regardless of their ownership status" (Mersha & Van Laerhoven, 2016, p. 1708). The women's physical abilities, or lack thereof, are used to justify the gendered restrictions.

¹⁰ <https://www.resilience.org/stories/2020-02-24/educating-girls-is-more-effective-in-the-climate-emergency-than-many-green-technologies/>
<https://www.rainforest-alliance.org/articles/5-critical-climate-actions-you-can-take-right-now>
<https://www.wired.com/story/to-stop-climate-change-educate-girls-and-give-them-birth-control/>
<https://ideas.ted.com/want-to-fight-climate-change-educate-a-girl/>

The responsibilities on the farm depend on the geographical location but overlap in many cases, it also depends on women's ability to participate and add to the existing power-relations. As discussed more in the following Findings chapters, males tend to hold access to most of the decision-making, controls resources and has a higher social status. But women play a significant role within the agricultural sector in the Global South. For example, the rice industry is known for actively engaging women, in Africa, Asia and even Latin America (Nelson et al., 2002). In comparison, in the context of Tierra Blanca (Costa Rica), if males are the farm managers, work on the land is a family effort, meaning each family member helps out, compared to when women manage the farm, she is often "doing all the heavy lifting and tasks" herself (Echeverria, 2020, p. 95). But besides the heavy input of women in production across continents, in SSA women seem to be most involved with the agricultural process and production compared to all other regions (Doss, 2014; Steady, 2014). The African women "provide the bulk of agricultural labor" and "are major resource managers" (Steady, 2014, p.1).

6.1.1 Unreliable Evidence

Research can be unreliable since in some cultures and communities, women are constrained to "say they have an economic role" (Momsen, 2019, p. 144). Thus, some statistical evidence can be unreliable since women would not always say they are also breadwinners. Moreover, as stated before, women do not produce food separately from men and it can be "impossible to disaggregate men and women's contributions either in terms of labor or in terms of output production" (Doss, 2014, p. 1). Moreover, the geographical location is a substantial part of explaining women's participation within agriculture and regions with smallholder farmers tend to have more women's participation (Momsen, 2019).

6.2 Gendered Roles and Responsibilities

The farming tasks are divided in both more feminine and masculine tasks but along their social and cultural roles (Aker et al., 2017; Arora et al., 2017; Steady, 2014; Momsen, 2019; Galina & Rozel Farnworth, 2016; Romero-Paris, 2014; Rola-Rubzen, 2010; Fletschner & Kenney, 2014; Tamang et al., 2014).

The following section focusses on the general global knowledge found in the articles.

6.2.1 Domestic and Subsistence

From the early hunter and gatherer societies, as still seen in many aboriginal communities across Australia, food gathering of women is one of the major sources of nutrition for the families (Momsen, 2019). These early types of subsistence food production extend to many women in the Global South today in order to secure their families livelihoods (Tamang et al., 2014). This goes hand in hand with the domestic tasks' women often have within the household, as most of their responsibilities lay close to and within the home (Mersha & Van Laerhoven, 2016). Women are often in charge of putting food on the table and other domestic tasks that exist within the household within the Global South (Galina & Rozel Farnworth, 2016; Romero-Paris, 2014; Fletschner & Kenney, 2014). It is understandable this is not universal, but the articles do not elaborate on differences.

Throughout the economically developing countries, one of the main responsibilities of the matrons is therefore to manage the small allotments and vegetable gardens surrounding the farm (Huyer, 2016; Steady, 2014; Romero-Paris, 2014). Other parts of the domestic tasks include childcare, laundry, cooking, cleaning, taking care of elderly and collecting water, wood, fuel or medicinal plants (Fletschner & Kenney, 2014; Tamang et al., 2014; Raney et al., 2011; Steady, 2014; Boyd, 2002). Even if gender roles vary per region, these household and domestic tasks persist and re-appear in many of the articles. For example, in Bangladesh, the women produce fruits and vegetables, manage the animal husbandry, cultivate fish, plant trees and process crops “which all add to the income” and livelihoods of the family (Romeo-Paris, 2014, p. 3). 2017).

6.2.2 Animal Husbandry

Concerning animal husbandry, the responsibility of purchasing and selling the “larger animals (cows, horses and oxen)” lies with men and the “control of smaller animals (goats, sheep, chicken and pigs)” belongs to women (Fletschner & Kenney, 2014, p. 3; Huyer, 2016); Kristjanso et al., 2017). Whereas the men herd larger animals, stock raising and ranching small livestock animals that reside within the homestead is a responsibility of women across the three continents (Huyer, 2016; Raney et al., 2011; Steady, 2014; Chanana-Nag & Aggarwal, 2018). However, others state that women execute not only most of the “processing of agricultural” products but also “most of the animal husbandry” and process of those animal products (Fletschner & Kenney, 2014, p. 5; Chi TTN et al., 2010; Arora et al., 2017). Regardless, the main tasks of animal raising for women include “managing poultry” and “dairy animals” for subsistence food and milk production (Raney et al., 2011, p. 14). The exact role of women in animal husbandry might shift change from region to region, but it is clear that women have a large role within the animal husbandry sector.

It is estimated that “two-thirds of poorer livestock keepers, totalling circa 400 million” are women (Raney, 2011, p. 14). All together with the task of domestic work to bring food to the table it is estimated that women “provide 85 to 90 percent of the time spend on household food processing and preparation” across a “wide range of countries” (Raney et al., 2011, p. 16). As comparable with the domestic tasks, women perform tasks that are adjacent to the home, so they are able to manage the “double burden of productive and reproductive work” (Arora et al., 2017, p. 1). Thus, animal husbandry often increases the total work burden adds to all domestic tasks.

6.2.3 On the field

On the agricultural field specific tasks or parts of the cultivation process of arable crops can be divided per member of the household (Call & Sellers, 2019; Arora et al., 2017; Lambrou & Paina, 2006). Again, almost all articles focus on the binary concept of gender, distinguishing the position of a male and female within the planting and harvesting cycle. Women tend to be in charge of more ‘delicate tasks’ whereas males are often in charge of ‘heavy tasks’ as seen in box 3 below (Galina & Rozel Farnworth, 2016, p. 12; Ylipaa et al., 2017, p. 9; Arora et al., 2017).

The delicate tasks might be called ‘delicate’ but often these are repetitious and time consuming (Momsen, 2019). The wording of delicate tasks used in the articles, can be seen as a reflection of gendered ideas in itself. Moreover, many of the women in the Global South work with an emphasis on providing for the livelihoods of the family instead of focusing

producing for sales (Momsen, 2019). But due to more pressure from CVC, these tasks and responsibilities shift and can be extra burdens on especially women.

Tasks and responsibilities	Tasks include	Reference
'delicate tasks'	<ul style="list-style-type: none"> ▪ Examples are weeding, transplanting, seed cleaning, seed selection, storing seeds, pulling and transplanting seeds, and many of the post-harvesting activities. 	Ylipaa et al., 2019; Chanana-Nag & Aggarwal, 2018; Call & Sellers, 2019; Chi TTN et al., 2010; Rola-Rubzen, 2010
'heavier tasks'	<ul style="list-style-type: none"> ▪ more physical labor and often include machinery. ▪ Examples are land and seedbed preparation, tilling, ploughing, fumigating, pesticide application, ploughing, irrigation, field leveling, and application of chemical fertilizers. 	Galina & Rozel Farnworth, 2016; Momsen, 2019; Akter et al., 2017; Fletschner & Kenney, 2014; Jha, 2004; Arora et al., 2017; Chi TTN et al., 2010; Rola-Rubzen, 2010; Momsen, 2019; Lambrou & Paina, 2006
Tasks done together	<ul style="list-style-type: none"> ▪ A common pattern across Indonesia, the Philippines, Myanmar and Thailand, was that “transplanting, weeding, manual harvesting and post-harvesting activities” were executed together (Akter et al., 2017, p. 274). ▪ Men support women with preparing of the land for crops, irrigating and harvesting. 	Akter et al., 2017; Huynh & resurreccion, 2014

Box 3: delicate and heavier gendered tasks

However, the culturally established roles could also determine that depending on the gender, one cultivates a certain crop. For example, women could cultivate “legumes” while men cultivate “maize” (Call & Sellers, 2019, p. 5). In South-East Asia the tasks and roles are very much divided among the genders. In comparison, African women “perform all the tasks” that men execute in agriculture but in Asia these tasks are strictly divided between genders (Arora et al., 2017, p. 1). And in Costa Rica (Tierra Blanca), all genders can manage the farm, control and mediate decisions over the fields (Echeverria, 2020).

6.2.4 Private and Public Sphere

The gender division and responsibilities of labor exceeds the private sphere and moves into the public sphere. Women tend to do work behind the scenes and traditionally home-based within the homestead, whereas men tend to be in the public eye, selling products on larger markets, and attending communal agricultural meetings (Huynh & Resurreccion, 2014; Raney et al., 2011). Moreover, males are often more mobile and can travel for different occupations outside of the house, agricultural fields and the commune, whereas women have restricted mobilities (Huynh & Resurreccion, 2014). Research by Raney and colleagues concluded that if the mobility of women is constrained, men will help market products but in general women have the ability to sell their own produce (eggs, milk, and meat).

6.3 Tasks after CVC

On top of all the domestic- and subsistence food production responsibilities, women face more additional farming responsibilities after farmers experience more impact of CVC (Tamang et al., 2014; Roehr, 2007; Kristjanso et al., 2017; Rola-Rubzen, 2010). The changes in agricultural work are developing “within existing gender roles” (Jost et al., 2016, p. 141). Meaning, all family members tend to keep the existing and traditional tasks and gain more

work on top of these. The traditional tasks of women are intensified through CVC and “womens participation is higher in areas prone to floods” and “in marginal or small areas (Chit et al., 2010, p. 112). Domestic activities like collecting firewood, fuel, fodder and water are affected by the changing climates with increasing localized “environmental degradation” (Nelson & Stathers, 2009, p. 87; Behrman et al., 2014). The decreased access to these resources means women gain more burdens when fetching these resources, since they need to “search further” (Nelson & Stathers, 2009, p. 87). For example, women and girls’ workloads are increased, in terms of “time and energy required to source, collect, and carry” the resources (Behrman et al., 2014, p. 4). Moreover, since these single activities take up more time, they could impact the long-term health of the latent, and for example “erode” them from opportunities like “education, training and income-earning activities” (Behrman et al., 2014, p. 4).

6.3.1 Out-migration of Principal Men

Out-migration of men, in the long-term adds to the burdens of women on the farms (Arora et al., 2017; Rola-Rubzen, 2010; Tamang et al., 2014). The absence of “principal men” and older sons for the more physically challenging tasks (as ploughing, carrying, hauling fields) can heavenly increase the workload for the “principal women” (Rola-Rubzen, 2010, p. 29). In Nepal for example, women traditionally took up the role of caregiver for children and elderly, had domestic tasks and the subsistence food production tasks, however since many men out-migrate to cities, women take up “traditionally male-dominant farming practices” (Tamang et al., 2014, p. 20). The women work multiple tasks and carry the burden of all the farm and housework, leading to “fewer crops in the cropping cycle” (Tamang et al., 2014, p. 27). These women manage the household tasks, “unpaid care work,” often singlehandedly, and sometimes with help of other women or girls (Arora et al., 2017, p. 1). In Latin America, for example, many male-farmers left the agricultural scene to sustain a household through non-farm activities, however the research does not state if CVC is the main cause, but it could potentially have some affect (Kay, 2015).

6.3.2 Health Risks

A health example of impacts of CVC on especially women can be found in a study by Steady of Kenyan, Ethiopian and Zambian women-flower-farmers. These women are now forced to use more pesticides and chemicals on the crops in order to prevent the spread of insects and protect the crops (2014). But these chemicals can result in “spontaneous abortions, miscarriages, infertility and other reproductive complications” (Steady, 2014, p. 320). Working with pesticides and other harmful chemicals was previously the responsibility of the males, however, since the out-migration of principal males women and girls are effected by the chemicals.

6.3.3 Financial Tasks

In Columbia, Patía in Cauca region, because of increasing CVC impacts, the women’s involvement and help on the farm and managing outside tasks double. The women “stepped up their game” to help with “financial costs of providing more water” because of more and longer droughts (Arora et al., 2017, p. 3). In addition, the women help gain more financial stability through “cultivating horticultural crops (lemons),” “collecting forest resources (mate/cane) for sale,” and work as “wage labor on other farms” (Arora et al., 2017, p. 3). The women in Patia gained more additional chores and work on the farms and the fields, while

their domestic work remains. The burden of increased workload rises and they are now also involved in more income related jobs, in order to secure enough income for the families livelihoods.

6.4 The Triple Burden

However, the debate within the agricultural sector remains, as seen in the previous examples, women often face a triple burden, which is more responsibility but can be a barrier to empowerment and is magnified because of CVC. Women also work on farms owned by other families within these traditional roles, this also created more burdens after CVC since they have to keep an income but also do subsistence tasks. The burden consists of:

Reproductive work	Household and domestic work as child, elderly and sick caring, fetching water/wood/fuel
Productive work	Subsistence work, work for income, work in formal and informal sector, husbandry activities
Community managing activities	Consumption and other activities undertaken by women at the community level

Table 11: The Triple Burden Women Face (Satyavathi et al., 2010; Manfre et al., 2013)

The 56 articles do not mention much about the Triple Burden thus additional research was done. In the context of CVC:

“we can interpret the triple burden on women as a situation where a gendered society places a burden of high responsibility on women without any corresponding level of decision-making power, providing fewer alternatives and possibilities to adapt to climate change.” (Ylipaa et al., 2019, p. 7).

The triple burden keeps increasing since there is more out-migration of males and through CVC more pressure on farmers. For women this in turn means more work in all three sections and additional burdens. Furthermore, males are traditionally, seen and considered as farmers (Assan et al., 2018). Women on the other hand face social and cultural restrictions as not being able to “freely procure inputs, sell products, hire labor” and many males “hold the farming contracts” (Agarwal, 2011, p. 6). The triple burden, that women get more responsibilities and tasks but do not get any extra power over decision-making or recognition, is an ongoing debate.

Moreover, women cultivators still depend on work within the agricultural sector as they do not have the same occupation accesses (non-farm jobs) in many cases. For example, Agarwal points out that in Africa in the year 2008, 63 percent of women were busy working in the agricultural sector, compared to 48 percent of males (2011, p. 5). Terry continues by stating that in Kenya and Tanzania, women “were constrained by lack of access to financial capital, gender norms that excluded them from the more profitable” non-farming activities (2009, p. 13). Women are stuck in an ongoing circle of agricultural and productive work.

6.5 Critique on Articles

CVC adds extra burdens on the smallholder family farmers but tends to increase women’s burdens the most. Even if in the articles the responsibilities were divided by mostly females and males, they can extend to other members of the household and can be influenced by not

only gender but also age, ability, education. However, some limitations of answering this question more objectively is that almost all articles focus on the binary perspective of gender and solely on the additional responsibilities' women tend to receive after the impact of CVC.

Chapter 7: Vulnerability and Access to Adaptation Strategies

4. Which gender is most vulnerable in regard to CVC and why?
5. Do Which genders tend to have the lowest accesses to CVC adaptation strategies?

The statement, *climate change is not gender neutral* is made often (Chanana-Nag & Aggarwal, 2018; Chi TTN et al., 2015; Dankelman, 2002; Echeverria, 2020) but to what extent is this the reality of smallholder farmers. And who tends to be more vulnerable towards changing climate and weather patterns? The following section discusses which groups of peoples tend to be more vulnerable to certain aspects of CVC and who does often have or gain access to become more resilient. Out of the 56 articles, 22 articles discuss vulnerability. Moreover, 37 articles focus specifically on the availability of accesses, but both have overlapping characteristics.

7.1 The Most Vulnerable

The changing weather and climate patterns are often long-term and do not only have ramifications for agricultural and ecological systems but also excessive complications on the human systems (Nelson et al., 2002). Hence, the consequences of CVC often fall on gender relations as an extension of the human systems (Nelson et al., 2002; Adzawla et al; 2019). This in turn often reflects on the position of individuals within a society, the power-dynamics and social resilience people have. Individuals with less power, access and agency have higher exposures to stress and are more sensitive and vulnerable to climate change. The concept of vulnerability in terms of CVC refers to, “the degree, to which a system is susceptible to, or unable to cope with adverse impacts’ of climate change, including climate variability and extremes” (Wrigley-Asante et al., 2019, p. n/a). A system is in this case the small-farm communities and the social dynamics that developed over time and are still evolving. The dangers correlating with CVC impacts many around the globe, but these hazards entail distinct effects on intersectional differences, like social class, age groups, ethnic groups (Carvajal-Escobar et al., 2008).

Smallholder farmers are notably vulnerable to the changes of climate variation (Morton 2007 in Call & Sellers 2019). Reason being is that many of these farmers depend on agriculture in order to sustain their livelihoods. Ways to improve agricultural inputs with changing climates are extremely expensive for these farmers in general, but “especially for women and female-headed households” who often lack access to adaptation strategies (Call & sellers 2019, p. 2). Moreover, cultural gendered roles, norms and rules result in women and girls being more vulnerable to “environmental stressors/shocks” as compared to men and boys (Call & Sellers 2019, p. 2).

As stated before, CVC and its impacts vary from country to country and within regions. But these impacts can also vary within the same community as certain groups have more resilience build up or more power to improve their situation. Often, the already marginalized are impacted most (Carvajal-Escobar et al., 2008). Additionally, climate change “intensifies

poverty” levels and people with most access to recourses are more able to cope in the short and long term (Chanana-Nag & Aggarwal, 2018, p. 15). The articles mostly focus on one particular group that seems to be most vulnerable, that generally overlaps from region to region.

Nevertheless, 19 articles in the current research indicated that CVC has different consequences for women and men because of their social roles and social position within society (Carvajal-Escobar et al., 2008; Chanana-Nag & Aggarwal, 2018; Dankelman, 2002; Ylipaa et al., 2019). For example, Call & Sellers state that “gender is one of the most universal and important stratifying elements affecting natural resource use and vulnerability to the effects of climate change” (2019, p. 2). Moreover, gender and climate vulnerability are intertwined in many ways. For example, as Kristjanso et al., states:

“Gender intersects with the vulnerability context in multiple ways – for example, men and women, of different ages, ethnic groups, etc. have different user characteristics, access to information and technology, relationships with institutions, and access to natural resources such as land and water” (2017, p. 485).

The poorest and most marginalized groups of the society are most impacted by natural disasters and climatic hazards, but in many cases these groups constitute of women (Carvajal-Escobar et al., 2008; Ravera et al., 2016; Steady, 2014). In addition, all genders suffer the negative consequences of CVC, but women farmers are generally more vulnerable to CVC and heavier affected (Adzawla et al., 2019; Chanana-Nag & Aggarwal, 2018; Jost et al., 2016; Lambrou, 2016; Mlambo-Ngcuka, 2015; Pearse, 2017; Ravera et al., 2016; Steady, 2014). Women tend to be more vulnerable in terms of environmental disasters (Carvajal-Escobar et al., 2008; Dankelman, 2002; Lambrou et al., 2006). One can indubitably wonder if women are always more vulnerable in cases of environmental change and distress, and if this information is biased, however it is a reoccurring topic and problem and has crucial relevance.

7.1.1 Expression of Existing Gender Inequalities

Vulnerability is in many cases an “expression of existing gender inequalities and power relations in societies across the world” (Adzawla et al., 2019; Pearse, 2017, p. 3). So even if all genders suffer the same magnitude of CVC, the females are in general “less likely to act to reduce” the vulnerability experienced and therefore tend to suffer most in natural disasters and other environmental emergencies like CVC (Kristjanso et al., 2017, p. 495). CVC also “strengthens the existing gender inequalities related to access to resources necessary to cope” with CVC (Chanana-Nag & Aggarwal, 2018, p. 15). Although, this might not always be the case, it is regularly discussed in the articles and in policy documents about vulnerability and disaster management.

7.1.2 Women are often Poorer

Women cultivators hand in hand with women in developing countries tend to be poorer and more marginalized. MacGregor and Mlambo-Ngcuka state that women “make up 70% of the world’s poor” (MacGregor, 2010, p. 3; Mlambo-Ngcuka, 2015, p. 323). Women are often economically marginalized and not involved in the decision-making processes, but Doss et al debunks the “myth” of 70% by stating that the research to this conclusion is “problematic” since it is not based on “individual level data or analysis” and the “myth itself has

demographically implausible implications” (2018, p. 70). The 70% might be debatable, but it stresses the fact that women tend to be more vulnerable in CVC situations because of their low social status and cultural barriers.

7.2 Gendered Access

7.2.1 Adaptation

Related to vulnerability is the chance of adapting to CVC and the extent of access a smallholder farmer can get. The evolutionary process of adapting to changing surroundings has been well known in agricultural families for generations. The ability to adapt on the other hand is “inherently” a “political process” that translates to winners and losers (Behrman & Bryan et al., 2014, p. 5). Dolefully it is often the woman that finds herself in the losing battle of trying to adapt to CVC. The ability to adapt to climatic disturbances and risks are shaped by the existing gender and power inequalities (Rossi & Lambrou, 2008 in Nelson & Stathers, 2009).

The chance of adapting can improve one’s “well-being outcomes” while simultaneously “reducing vulnerability to future CC by increasing the ability of actors to withstand change and cope with its adverse effects” (Behrman & Bryan et al., p. 2014, p. 3). The actors of adaptation can be dispersed from the individual to the community level. Moreover, these actors can have contrasting “perceptions,” “needs,” and “preferences” and “make up adaptation decisions based on their decision-making power and access to/control over resources” (Behrman & Bryan et al., p. 2014, p. 3). These diverse resources can include time available, accessible assets, their lifestyle and values. Therefore, the concept adaptation and access are intertwined. For example, in Ghanaian context, the different access to resources between females and males is “one of the key dimensions of gender inequality” (Wrigley-Asante et al., 2019, p. 3).

7.2.2 Access

Intertwined with the vulnerability level is access to adaptation strategies and access to resources in general. The ability to adapt to CVC related events for both long and short-term generally depends on the “control over land, money, credit and tools, good health, personal mobility and secure housing” which are all gendered (Momsen, 2019, p. 137). Furthermore, the limited access to for example “agricultural tools” and “knowledge about new practices” can hinder and limit “the scope of reducing time and labor efforts” (Chanana-Nag & Aggarwal, 2018, p. 22).

These gendered disparities within a household often cause women to face complications if they were to gain the same adaptation strategy accesses as males. Besides, it is even harder for women to “influence mitigation and coping strategies” and give their own thoughts on these topics (Momsen, 2019, p. 137). If a person has more access to natural resources, farm expenses and local community meetings, the chances of this individual becoming more resilient and less vulnerable are higher due to better chances of adapting. The articles indicate that there is a difference between women’s and men’s “access to and over key assets” (Behrman et al., 2014, p. 3). Generally, across developing countries, women have fewer assets, rights and access compared to men (Behrman et al., 2014; Momsen, 2019; Chanana-Nag & Aggarwal, 2018).

A study by Assan et al. in Ghana shows that there is a distinct interaction between the concepts gender, culture and social class. The three latent influence “access to and control over critical resources” that are crucial for CVC adaptation for farm households, “particularly the female headed ones” (Assan et al., 2018, p. 13). The study continues to state that the low female participation in CVC adaptation is “rooted in gender relations, sociocultural norms, and power relations” (2018, p. 13).

7.3 CVC, Women and Access

The agricultural sector employs millions of women around the world, but these cultivators often face constraints, including the ones related to cultural, social and gendered norms and “limited resource access” that are “further magnified in the wake of CVC” (Chanana-Nag & Aggarwal, 2018, p. 22). However, the differences in “gendered climate adaptation” are often a result of “gender barriers and not a preferred decision by women and men (Mersha and Laerhoven, 2016; Adzawla et al., 2019). CVC adaptation can also “reinforce gender inequalities and marginalization” because the “gendered differences in knowledge and experiences with natural resources can influence the priorities people place on adaptation strategies” (Sultana, 2014, p. 378). These gendered gaps in access and control, still “continue to exist” within the agricultural sector (Huyer, 2016, p. 106). The gendered hierarchies in place leads to “unequal access to power, strategic resources, education, employment and information” (Steady, 2014, p. 323). In contempt of the gendered inequalities, both genders “demonstrate their resourcefulness in reducing their vulnerability to CVC impacts” (Assan et al., 2018, p. 13).

7.3.1 Access to the Decision-Making Process

Even if women have a substantial share of the agricultural production and activities, they generally have less access to the decision-making processes and/or authority (Alkire et al., 2013; Carvajal-Escobar et al., 2008; Ihalainen & Sijapati Basnett, 2015; Kristjanso et al., 2017; Lambrou & Piana, 2006; Momsen, 2019; Wrigley-Asante et al., 2019). In some regions, women might have a say within the domestic sphere, but women are often excluded from important decision-making processes. For example, they generally have a meager decision-making power or “control over inputs and outputs” (Lambrou & Piana, 2006, p. 18; Terry, 2009). Furthermore, besides the lower decision-making role within the community, the latent are generally “excluded and underrepresented in decision-making and policy processes” regarding CVC (Wrigley-Asante et al., 2019, p. 4). Women cultivator’s “participation in climate resilience response decision making is low,” and the needed “redistributive actions necessary to address climate vulnerability do not account for the differential needs of women and girls” (Anderson & Sriram, 2019, p. 3). Hence, there is a poor recognition of the needs and tools women could use to battle impacts of CVC and to use their input and knowledge on the topic to further strengthen the resilience of communities.

However, “women in Southeast Asia are generally more empowered compared with women in other developing countries” (Mason and Smith, 2003 & IFAD, 2013 in Akter et al., 2017, p. 270). In South Asian women generally have “higher decision-making power” at the household level and “control over own earnings” (Akter et al., 2017, p. 270). A similar conclusion was made in a study by Akter et al. in Thailand, Indonesia, Myanmar and the Philippines where they found that the decision-making process about larger expenses were “made together” (2017, p. 271). Another example from Ghana shows that women were in charge of decisions surrounding new crop varieties because they “are responsible for family’s food supply” (Jost et al., 2016, p. 137).

Although the described examples highlight exceptions, regularly women are overlooked, but could be more involved to improve productivity of rural households. Additionally, in aiming to achieve a more gender equal agricultural sector, the voices of women are “critical in climate negotiations, national and regional mitigation and adaptation planning” (Nelson & Stathers, 2009, p. 82). Women tend to have less decision-making outside the household and at the community level but could be in charge of reproductive work and domestic tasks within the household and can make decisions about smaller expenses, as health related needs and nutritional expenses. By increasing economic pressure and out-migration, gender roles become more flexible and could potentially add to more decision-making power of the women, as seen in South Asia. Besides that, community women’s initiatives and networks help increase social capital and knowledge sharing which generally means more empowerment within the community and household and in turn more decision-making chances (Lawson et al., 2019).

7.3.2 Access to Information and Knowledge

Hand in hand with the decision-making process is the connection and access to information and advisory services. So, besides the lower decision-making authority women have, they face “additional social, institutional and cultural barriers to accessing and adopting” agricultural adaptation strategies (Kristjanso et al., 2017, p. 489). Smallholder farmer women in the Global South have reduced access to information in comparison to men (Berhman et al., 2014; Call & Sellers, 2019; Kristjanso et al., 2017; Lambrou & Piana, 2006; Jost et al., 2016; Fletschner & Kenney, 2014; Galina & Rozel Farnworth, 2016; Huyer, 2016; Chanana-Nag & Aggarwal, 2018). Jost et al., alleges that the access to information “appears to be limited by their lack of technology ownership” which is “held by men” (2016, p. 141). Information is in this case, about technology, for new and resilient resource use, for extension services, information about CVC impacts or weather patterns, about financial institutions or credit, in short information given by the community and NGOs in order to become more resilient and able to adapt to CVC.

In a study by Kristjanso et al. the authors argue that in African sites, men are more likely to receive information through “extension, private sector, and other formal sources” (2017, 490). Whereas women mostly rely on more “personal connections and informal sources” (2017, P. 490). Further, men tend to have greater access to for example “institutions and services” that come from “outside their own communities” compared to women (Kristjanso et al., 2017, p. 490).

Gaining access to information and through this the financial markets, “enables longer-term saving and borrowing and increases the ability of households to obtain insurance” (Carranza & Niles, 2019, p. 3). Thus, the ability to gain access to information that extends the village level, helps a farmer adapt easier because one knows more options are out there. Having access to information is dire for CVC adaptation. However, while neither women or men are “receiving sufficient access to agricultural and weather/climate-related info,” the women are “particularly neglected” (Kristjanso et al., 2017, p. 495).

7.3.3 Access to Financials

As stated before, having less access to information, is connected to access to financial insights and financial institutions. Smallholder cultivator women tend to have “less access to

financials of the farm” or the household and reduced access to financial capitals or credit (Adzawla et al., 2019; Berhman et al., 2014; Fletschner & Kenney, 2014, p. 2; Call & Sellers, 2019; Kristjanso et al., 2017; Carranza & Niles, 2019; Terry, 2009; Jost et al., 2016; Wrigley-Asante et al., 2019). Moreover, without access to insurance or loans, the farmers facing “negative shocks” (droughts, illness, drop in prices) “can lose some of the few assets they do have” since they have not build up reserves for instant shocks (Diagne and Zeller, 2001 in Fletschner & Kenney, 2014).

If one does have access to information about credit, savings and insurance one can adopt “effective strategies to stabilize their food consumption,” “reach markets more effectively” and can “afford to invest in riskier but more profitable enterprises” (Zeller et al., 1997 in Fletschner & Kenney, 2014, p. 2). By the same token, Wrigley-Asante et al. indicates that if “women’s ability to support the home financially” increases, this improves “their decision-making role” (2019, p. 11). Moreover, economically vulnerable women are most impacted by economic losses (Enarson, 2000 in Carvajal-Escobar et al., 2008). So even if they wanted to become more resilient, they often lack the tools to do so.

Furthermore, in India, the marginal female cultivators face a high vulnerability as with drought and heat waves as a result of “lack of access to financial and agricultural resources” all in all increasing their burdens (Chanana-Nag & Aggarwal, 2018, p. 23). The Indian women also have limited access to credit facilities, and financial advisory services (Chanana-Nag & Aggarwal, 2018). In Paraguay, women in rural areas are “15 to 21 percent less likely than men to have basic information about the financial institutions in their communities” (Fletschner & Kenney, 2014, p. 2). In Rural Ethiopia, farm income of female-headed households was very different from the male ones, since often “female-headed households could keep only half or one-third of their harvest” because of a “sharecropping arrangement (Mersha & Van Laerhoven, 2016, p. 1711). Whereas the males could keep everything.

On a more positive note, a study in Kenya, Uganda and Senegal by Carranza & Niles found that if one gains access to credit, individuals can build up resilience for CVC and lower shocks (2019). Thus, if women gained more information about available financial services and access to these, they could potentially improve their “agricultural output,” “food security and economic vitality of entire communities” (Fletschner & Kenney, 2014, p. 2). Boyd found that when Bolivian farmers are given more access to information, is can be seen as an “important aspect of empowering marginalised sectors within communities” (2002, p. 76). What farmers do with this information can be empowering since they themselves can control the future.

Women cultivators in general, appear to be less adaptive. This is mainly because of “financial or resource constraints” and because of “male domination in receiving information and extension services” (Jost et al., 2016, p. 133). Furthermore, if there are adaptation strategies available for women, these “tend to create higher labor loads” so without the correct information, it would be likely women do not invest in such strategies (Jost et al., 2016, p. 133).

7.3.4 Access to Representation

The struggle of gaining more authority and respect is often hard for women. Since they are not represented in meetings, and the male’s control of assets and resources could “restrict” a woman’s “self-determination (Ylipaa et al., 2019, p. 6). In a study on policy documents all

over the developing world, Lambrou and Piana found that even if a woman owns her own farm, she has to consult men to “represent them in meetings” for instance to “ensure water for their plots” (2006, p. 18).

In addition, in Bolivia, women were “rarely” present at for example “forestry program meetings and workshops (Boyd, 2002, p. 73). If they were present and raised certain issues or asked for attention towards these, they “were “pushed down the list of priorities” (Boyd, 2002, 74). This might be one of the reasons the women of these communities stated that their husband knows best about certain topics, as he attended meetings and they did not. Nonetheless, the author also points out that the lack of voice was also experienced by some of the poorer and marginalized males of the community. Moreover, the author claims that “Neither in the context of the project, nor at community meetings, was there any evidence of a focus on the socio-political and economic roles of women in decision- making, or their relationship with their environment” (2002, 74).

7.4 Resource Access and Control

Resource access and control over this is often gendered and unevenly divided (Nelson & Stathers, 2009). Women cultivators generally lack ownership and control over natural resources in the Global South (Lambrou & Piana, 2006). These resources can include “land, water, trees, social networks, income, credit, government social protection, safety nets, health facilities, political power, education and infrastructure” (Nelson & Stathers, 2009, p. 83). Moreover, women cultivators in general typically have less access and assets than men. Moreover, not mentioned accesses they do often lack are “extensions and resources for agricultural production” (Perez et al., 2015 in Kristjanso et al., 2017, p. 489). Lastly, Mersha & Van Laerhoven, allege that “access to markets, extension and credit services, technology and farm assets (as capital, land, labor)” are all “critical in helping African farmers” adapt to CVC (2016, p. 1702). Women tend to face unequal access to certain agricultural inputs that could help them become more resilient and gain access to adaptation strategies. These agricultural inputs can include “land, labor, knowledge, fertilizer, and improved seeds and seedlings” (Kristjanso et al., 2017, p. 483). The lack of access to the latent keeps the unequal gender gap in place.

7.4.1 Lack of Control over Land

A barrier to properly adapt to CVC impacts in the long and short term are the lack of access to land and ownership thereof (Lawson et al, 2019). Access to land is also “linked to vulnerability, livelihoods and food security” (Lawson et al., 2019, p. 448). Generally, women tend to have reduced access to ownership of land and land use (Anderson & Sriram, 2019; Berhman et al., 2014; Call & Sellers, 2019; Lawson et al., 2019; Denton, 2014; Kristjanso et al., 2017; Kelkar, 2009; Sultana, 2014). In addition, women are less likely to “own land titled under their name, even when their families own land, and are less likely than men to have control over land,” even if the woman owns it” (Fletschner & Kenney, 2014, p. 3). Moreover, they often face “institutional discrimination” to certain accesses and assets (Fletschner & Kenney, 2014, p. 3).

Moreover, the limited access to for example “land and land tenure” on top of “poor credit facilities” can hinder the adoption of adaptive measures (Denton, 2004, p. 48; Anderson & Sriram, 2019). In addition, on top of the hinderance of adaptive capacity, the latent could also “forestall poverty” in the Sahel area (Denton, 2014, p. 48). The “limited rights” women have in regard to access of land and ownership “poses a threat to inclusion” (Jost et al., 2016, 141).

The weak control over productive assets (land, water) can also translate to restricting women to “diversify their livelihoods away from climate sensitive areas” (Anderson & Sriram, 2019, p. 3).

In SSA and Asia, “women tend to have less access” and control over land “(both in terms of quantity and quality)” (Kristjanso et al., 2017, p. 486). This puts them at a considerable disadvantage when trying to adapt to changing climates and seeing which options are available.

Female cultivators are less likely to invest “their own money in improving the land” if it is not their own land, but if the land is “purchased in their own names” they “were much more secure in their right to the land” and quicker to adopt certain adaptation strategies (Kelkar, 2009, p. 17). However, if female cultivators gain more control over assets, land, property, and financials etc. there could be drastic social and cultural changes (Kelkar, 2009). In Bangladesh, India and Nepal the changes in norms because of women’s empowerment and “independent land rights” led to women being able to “address the local world of male dominance, face stigma and humiliation in case of any transgression of gender norms” (Kelkar, 2009, p. 16).

Poor women are “most vulnerable to loss of natural resources” (Momsen, 2019, p. 137). As “major custodians, consumers of natural resources” women are vulnerable to seasonal changes, let alone more unpredictable and more extreme CVC (Steady, 2014; Romero-Paris, 2014). Women are the natural resource managers and primary users, as they are in charge of collecting water, fuel, food, and forest products (Lambrou et al., 2006; MacGregor, 2010; Mlambo-Ngcuka, 2015; Nelson et al., 2002). Abrupt and long-term changes to the weather and climate patterns often affect their tasks as “primary producers of food” (Mlambo-Ngcuka, 2015, p. 323). Women depend on the local and natural resources to sustain not only their own livelihoods, but also that of the family and surrounding communities.

Concluding, there are many “discriminatory and socio-cultural rigidities” in place that block women “from obtaining effective control of property, assets, and resources” that could help them adapt and prevent further intrusions from CVC (Kelkar, 2009, p. 17). The lack of control over land might be a barrier to adaptation strategies.

7.4.2 Access to Inheritance Rights

Hand in hand with access to land is having access to inheritance rights. Having those accesses could lead to a better implementation of CVC adaptation strategies since they would know the future of the farm is their responsibility. However, in half of the developing countries, “discriminatory customary practices” are found against women (Huyer, 2016, p. 106). Women are more prone to losing assets, rights and access in case of “separation, divorce, or widowhood” (Behrman et al., 2014, p. 3). Additionally, Huyer found that in “nearly 1/3 of developing countries, laws do not guarantee the same inheritance rights for women and men” (2016, p. 106). The author alleges that women have less security over the land since they have less authority and less rights as a farmer (2016). Moreover, the latent continues stating that the “lack of security of land tenure” could result in “lower access to credit and inputs leading to inefficient land use” and in term “reducing yields” (Huyer, 2016, p. 106).

In addition, being married to a man tended to help the women in gaining access, whereas the single female-households tended to lack these accesses. In Ghana the married women farmers had “better access to information, agricultural input and land” because of their husbands (Lawson et al., 2019, p. 445). This in turn influenced their choices in CVC adaptation strategies, since they had more access to information and the resources to purchase the necessities. Women who had the same accesses to land as men, “were able to improve or optimize their livelihoods” (Onta and Resurreccion 2011 in Lawson et al., 2019, p. 446). However, Ghanaian women are not able to culturally inherit land from their fathers so gaining access to ownership tend to be a struggle (Lawson et al., 2019). But married women were able to gain access to land because of their husbands/family members. The individuals with lowest land ownership were “younger, widowed and single female farmers” (Lawson et al., 2019, p. 446).

In Kenya, Uganda and Senegal, the formal instructions, in order to help with for example adaptation resilience, “allocate money to property owners,” this, however, is detrimental since many women do not own property because “inheritance laws favor men” (Carranza & Niles, 2019, p. 2). It is therefore important to look at the differences between women, their marital status, their class, age, or if they own land or are land less. All these factors influence the amount of access to adaptation strategies and access in general.

7.5 Access to Mobility

Besides a lower control over the land, influence on decision-making and a lower input and observance of information, women tend to be less free in their movements. Women tend to have less access to for example, public transport, which forms a restricted mobility (Fletschner & Kenney, 2014). A study by Kristjanso et al. argues that throughout Ghana, Uganda and Bangladesh women have restricted mobility, which is due to “social norms, lack of access to transport, and heavy domestic responsibilities” which all “limit their options for adaptation” (2017, p. 490). Women tend to be obliged to stay within the homestead, which in turn translates to having lower access to community meetings, or other investor meetings that could be discussing new information on climate adaptation strategies (Fletschner & Kenney, 2014).

7.5.1 Access to Out-Migration

Throughout the Global South there is a large influx of out-migration to the urbanized parts of a country. This means many males and younger educated youth leave for the bigger cities, leaving often the elderly, girls and women behind (Anderson & Sriram, 2019; Chanana-Nag & Aggarwal, 2018; Huyer, 2016; Huynh & Resurreccion, 2014; Rola-Rubzen, 2010; Tamang et al., 2014). They take over the roles of men, adding more burdens and work since the off-farm tasks still continue. Without the access and authority of a male, it is often hard for these women to gain access to certain resources and properly manage the farms and agricultural fields. Moreover, it is harder for a single woman to hire labor because of economic and cultural reasons (Chanana-Nag & Aggarwal, 2018).

An example from Nepal by Pearse shows that male out-migration has increased in the recent years, leaving women behind (2017). Besides the increase of work burdens on the farm, these women face difficulties in case they want to access “finance and equipment” which is “due to the historical lack of social power and access to markets” (Pearse, 2017, p. 5). Moreover, in Nepal and India over the past years, there has been a large increase in male out-migration, in

almost all cases “increasing their burdens” and adding to “existing household tasks” (Anderson & Sriram, 2019, p. 3).

However, male partners who left for other occupations can sometimes be beneficial for women. For example, women “may experience increased economic autonomy and opportunities” with which they can “set up small home-based enterprises” (Pearse, 2017, p. 5). This can be done without the authority of their partners. A similar phenomenon occurred in the north of Mali. Even if the women faced more workloads because of CVC and low market accessibility compared to men, they were able to “exploit new environmental conditions by cultivating forest products that had hitherto been unavailable” (Djouidi & Brockhaus, 2011 in Pearse, 2017, p. 6). Meaning that even women in more vulnerable social status or positions can find resources to adapt to CVC without the help of a male.

In the state of Uttarakhand, in northern India, the “economically driven” out-migration of males, results in “good access to land and diversified incomes” for middle-aged women (Ravera et al., 2016, p. 346). In addition, these women are now more “involved in agriculture,” “marketing” and play a larger role in “decision-making in their domestic spheres” (Ravera et al., 2016, p. 346). So, in turn the out-migration of males can lead to more empowerment for women.

7.5.2 Access to a Formal Education

Women have less access to a formal education (Chi TTN et al., 2010; Fletschner & Kenney, 2014; Chanana-Nag & Aggarwal, 2018; Lawson et al., 2019; Lambrou & Piana, 2006). These lower literacy levels “along with socio-cultural norms associated with a patriarchal structure” hinder the productivity of women cultivators because they “inhibit decision-making and access to key resources including credit, information, and markets” (Chanana-Nag & Aggarwal, 2018, p. 22). In comparison to women, males in the Global South, generally tend to have “higher education levels” and “higher wages” even if both involved in cultivation (Chi TTN et al., 2010, p. 203). But if women gained a higher level of education, their ability to access “relevant information” and “get their voices through to decision-makers” increases substantially” (Lambrou & Piana, 2006, p. 36).

In Ghana, the level of education influenced adaptation levels, whereas lower levels of education “limit the ability of people to gain extra employment opportunities” outside of the farming sector, “which many women lacked” (Lawson et al., 2019, p. 449). All in all, the lower access to education in turn translates to limited mobility since the women will generally stay within the domestic sphere.

7.6 Breaking through the Social Barrier

All in all, the sex of a smallholder farmer and/or household head “influences adaptation decisions” and it is found all over the Global South that female-headed households are “less likely to adapt to CVC given that they face more barriers (such as fewer assets, lack of access to information, or less access to credit) (Bryan et al., 2013 in Kristjanso et al., 2017, p. 486). Besides the double or triple burden that was discussed in question 3, social barriers could facilitate adaptation processes of men and hinder women’s (Mersha & Van Laerhoven, 2016, p. 1712).¹¹

¹¹ “restrictive norms against women’s ploughing (informal institutional barrier), the de facto exclusion from participating in the reciprocal labor support system (social barrier) and their lower bargaining power in

7.6.1 Women's Initiatives and Agency

Besides the barriers, women face cultural constraints, however, do have agency and should not be seen as only vulnerable statistics. There is evidence that states if, female cultivators gain the same access as men, “farm as productively” (Doss et al., 2014; Wrigley-Asante, 2014, p. 1). Moreover, women are regularly overlooked in decision-making processes, but could be “at the forefront of implementing new farming techniques” (Ihalainen & Sijapati Basnett, 2015, p. 8). And if women gained equal access to the same resources as credit, land, and education, it is estimated that “100-150 million fewer people would be hungry” (Ihalainen & Sijapati Basnett, 2015, p. 9).

Lawson et al. reports that in some cases in Ghana women formed a collective agency in an attempt to “decrease common vulnerabilities by mobilizing their networks and social capital to prepare and respond to CVC risks” (Reed, 2017 in Lawson et al., 2019, p. 441). By organizing themselves, these women increased their social capital and aimed for “collective action,” “knowledge sharing” and “social learning” (Lawson et al., 2019, p. 441). The community-initiated response led to sharing of adaptation ideas, collective responses and a more prominent role of women.

A study by Call & Sellers (2019) offers examples in Benin, Haiti, Nigeria and Malawi of cases where “women were actually more likely than men to adopt new agricultural technologies” because “these interventions were related to farming activities carried out by women” (2019, p. 6). Moreover, female cultivators in Bangladesh and Malawi, after adopting new agricultural technologies, were able to increase their “household decision-making power,” their “income,” “provide more time for girls’ education, and improve children’s nutritional outcomes (Call & Sellers, 2019, p. 6). Thus, the adaptation of new technologies in order to battle CVC impacts, in turn lead to beneficial outcomes not only for the women themselves, but also for the future generations.

7.7 Specific Adaptation Strategies

The following section focusses on programs, policies and trainings that are implemented by organizations and governments. What happens to women and men cultivators through CVC impacts is reinforced by these GO’s and NGO’s.¹²

One-way farmers can adapt is through a widely used climate-smart approach called ‘conservation agriculture’. But in turn this “increases the amount of time women spend weeding” enhancing their overall burdens (Beuchelt and Badstue, 2013 in Kristjanso et al., 2017, p. 492). Kristjanso et al., notes that if one aims to increase women’s empowerment, it can only be reinforced into the agricultural sector by paying attention to “gender sensitive implementation approaches” (2017, P. 492).

7.7.1 Community Based Adaptation

Another method smallholder farmers can adapt more inclusively and productively is through community-based adaptation [CBA]

establishing sharecropping arrangements (institutional barrier) intertwine to eventually result in a low financial capacity (financial barriers) of female- headed households. As a result, storage adaptation measures become unfeasible for them” (2016, p. 1712).

¹² Governmental and Non-Governmental Organizations

Behrman et al. claims the latent includes any group-based approach that:

1. “Requires collective action and social capital;
2. Incorporates information about long-term CVC and their anticipated impacts into planning processes;
3. Integrates local knowledge and perceptions of climate change and risk-management strategies;
4. Emphasizes local decision-making processes;
5. Accords with community priorities and needs;
6. provides poverty reducing or livelihood benefits” (2014, p. 5).

In spite of the best intentions, Behrman et al. forgets to mention that women in a community often face “time constraints that affect their ability to participate in community-based climate adaptation initiatives” or “may reject practices that increase their labor burdens” (Huyer, 2016, p. 106). For example, in many communities across SSA, the women lack access to “irrigation infrastructure” and other technologies that are available to men (Huyer, 2016, p. 106). In addition, studies in Ethiopia, Rwanda, Kenya Malawi, and Uganda found that “women and female-headed households were less likely than men and male-headed households to adopt CSA practices” (Call & Sellers, 2019, p. 5).

The current trainings about adaptation strategies in developing countries given to women cultivators are not always productive. For example, in rural Ethiopia, women were given trainings that focused on “their reproductive and community roles (child nutrition, hygiene and sanitation, family planning),” but not on “developing their farming skill” or adaptive skills (Mersha & Van Laerhoven, 2016, p. 1709). Trainings like these might have good intentions, but just reinforce the “local gender norms and division of labor” (Mersha & Van Laerhoven, 2016, p. 1709). Moreover, Terry found that the current adaptation strategies in rural areas can “alter intra-household gender relations, to women’s disadvantage” (2009, p. 13).

Moreover, studies in West and East Africa found:

“that men, male-headed households, and households with a higher proportion of men were more likely than women, female-headed households, and households with a higher proportion of women to participate in programs that promote the use of fertilizer” (Call & Sellers, 2019, p. 5).

As fertilizer is one of the adaptation strategies to combat CVC, it is dissapointing to see that very specific barriers are still in place that withhold women’s use of fertilizer, these barriers “include lack of capital, credit, and equipment, as fertilizer is typically expensive” (Call & Sellers, 2019, p. 5).

The inferior position of women’s adaption levels could “relate to high labor requirements” and/or “the fact that such investments are long term in nature” (Kristjanso et al., 2017, p. 495). The latent tends to require large up-front expenses, but the benefits are only seen in the long run, which can often be the case for CVC adaptation strategies. Kristjanso et al. affirms that one of the reasons women tend to have lower adaptation levels in CVC related events is that they face “less access to resources, including labor and money, and less secure tenure to assure them that they will benefit” from the investments (Kristjanso et al., 2017, p. 495). The

lack of access together with the high labor requirements and the long-term investment converts to a harder chance of adopting CVC adaptation strategies.

Additionally, research from Kenya, Uganda and Senegal found that “the least food secure households, particularly female-headed farms,” were the least likely to “adopt new agricultural technologies due to factors including lower income and lack of access to financial resources” (Carranza & Niles, 2019, p. 2; Jost et al., 2016). Even if the CVC impacts were more detrimental for women, the capacity to adapt was much higher for men (Adzawla et al., 2019, p. n/a). It was observed that there are distinctions in the capacity to adapt between a male and a female. The highest adapting means to CVC was found among “male household members” and “male heads” (Adzawla et al., 2019, p. n/a).

All in all, it is clear that smallholder men hold more access to CVC adaptation strategies compared to female cultivators. One of the main reasons for this is the engrained cultural and social inequality between genders. Climate adaption is just one of the many factors that confirm the gendered dynamics. It is often the individual with most power and responsibility within the household that gains access to information and resources to battle CVC. It is the fact that many smallholder farmers always faced environmental distress and uncertainty, but CVC is more extreme, long-lasting and detrimental. One can wonder if CVC could have positive impacts on women smallholders and give them more empowerment, but this in turn depends on the gender inclusivity, thoroughness and coordination of CVC adaptation strategies.

7.8 Critique

Even if women tend to face more restrictions in gaining accesses, Lawson et al. found that in Ghana social factors as, “age, migrant status, and marital status” influence the extent of “access to and ownership of land” and most of the essential “economic and natural resources” on which “the survival of most households depends” (2019, P. 443). These factors therefore also influence the amount of access an individual has to certain resources. Moreover, it is logical that a female with more income and land ownership tends to have more access than someone with less. In Bolivia, Boyd also found that marginalized males tend to have less representation in community meetings, much like the women do (2002). However, most articles state that women do face more social, cultural, and economic barriers to adaptation strategies.

Chapter 8: Representation in Policies

6.How are different gendered farmers represented and included in policies?
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After exploring the effects of CVC on smallholder farmers, the traditional gendered roles and tasks within agriculture, the gendered vulnerabilities and the gendered accesses or lack thereof, it is important to see if marginalized cultivators are represented in policy documents. This intertwines with the final question, answering why women and the more vulnerable genders are important to take into consideration for future policies, what they might add and could help change. The following section is answers question 6, using 16 articles to see how gendered smallholder farmers are presented in policies and treaties.

8.1 Policies, Gender and CVC

8.1.1 Gender in Policies

One of the first major international treaties for the importance of gender equality and the perspectives of women was the “Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)” (Gumucio & Rueda, 2015, p. 44). This treaty was adopted by the United Nations in the year 1979. The goal of this treaty was:

“parties must ensure women’s meaningful participation in decision-making in rural planning and guarantee their access to trainings, extension services, agricultural credit, loans, and technology” (Gumucio & Rueda, 2015, p. 44).

For the early 1980s this was a large step forward towards a more inclusive and gendered approach. The bill of rights for women aimed to ensure the parties bore in mind specific problems women faced within rural areas and take all measures necessary to not exclude rural women from participating and benefiting from new rural developments (Gumucio & Rueda, 2015, p. 44). After this treaty, the Beijing Platform Action of 1995 was another substantial step for the inclusivity of women. This set of action plans addressed gender and the environment by “promoting gender equality and ending discrimination against women” (Gumucio & Rueda, 2015, p. 44).

Policies became more women and later more gender focused in the early 1980s to early 2000s. This critical importance of a more gendered implementation was mostly highlighted by “policymakers and development practitioners” (Peterman et al., 2014, p. 2). These latent expressed the relevance and priority of including gender in “the implementation, evaluation, and effectiveness of programs” across different “social and economic sectors” (Peterman et al., 2014, p. 2).

In the year 2000, the UN-Millennium Declaration “calls for equal rights for all, independent of race, sex, language, or religion” (Gumucio & Rueda, 2015, p. 44). Other topics as solidarity, tolerance and freedom intertwine with the concepts of gender equality. The latent covers topics to ensure better international collaboration and relation. Important gender indicators include, “equal rights between women and men; gender equity as an effective means of combatting poverty and promoting sustainable development; and the ability for all to benefit from new technologies” (Gumucio & Rueda, 2015, p. 44).

Furthermore, gender became a more pressing issue for policies and treaties and a more dominant topic throughout publications. For example “gender and climate change” was described in a 2002 special issue of “the journal Gender and Development” (Pearse, 2017, p. 3). This publication reflected on the intertwined relationship of CVC, gender and poverty.

8.1.2 Lack of Gender Inclusiveness in CVC Policies

The described treaties and following policies in theory are a steady start for more gender inclusiveness; however the main focus is on impacts of CVC on women, whereas this should be more focused on “how gender is intersected by other axes (e.g. caste, class, age)” and also include the “relational analysis of women and men across social categories in changing climates” (Sultana, 2014, p. 374). If programs address the more practical gendered needs, these often lack to mention and address the masculine bias that is found in “access to

information, employment opportunities, decision-making and institution building” (Sultana, 2014, p. 378).

Later research indicates that women and gender are hardly always addressed (Roehr, 2007). Nevertheless, gender blindness is not only in the development department, also in the “environmental social sciences in general” (MacGregor 2010, p. 3). This is often because “women’s organizations or gender experts” are not included or involved within the process of collecting data to implementation of policies or projects (Roehr, 2007, p. 6). Women are often more heavily affected by CVC but the patriarchal structures and ideologies within societies and “on which development projects have been based led to women’s invisibility” (Lambrou & Piana, 2005; Carvajal-Escobar et al., 2008, p. 277). However, in many policy documents women’s role in disasters management, farm management and combatting CVC, are still invisible and lacking. Moreover, women cultivators are generally excluded in policy documents or not given much attention.

Even if CVC is very gendered and impacts individuals differently, the specific impacts of CVC on for example gender relations and dynamics “have not been widely studied to date” (Nelson & Stathers, 2009, p. 58). The issue of gender aspects in CVC are also often “neglected” (Lambrou & Piana, 2006, p. 27). The lack of focus of gender within CVC policies and projects translates to the dynamics remaining largely invisible (Nelson & Stathers, 2009, p. 58). Additionally, still today many researchers, donor organizations, global institutions and development departments “lack research on women specifically” (Roehr, 2007, p. 6).

The lack of female focus in CVC is concerning as the phrase “*No climate justice without gender justice*” has become popular since 2007 at the Bali COP₁₃ conference (Sultana, 2014, p. 373). This statement shines light on the “fact that CC is gendered in impacts, mitigation, adaptation and policy processes” (Sultana, 2014, p. 373). Moreover, gender should be at the heart of CVC policies and projects since there are “gendered differences in perceptions, responses, priorities, abilities, and preferences in the ways that climate change is understood in mitigation and adaptation discourses” (Sultana, 2014, p. 373).

Not to mention, in 2009, the newly published *Gender and Agriculture* book¹⁴ warns “that the failure to recognize the roles, differences and inequities [between women and men] poses a serious threat to the effectiveness of the agricultural development agenda” (Peterman et al., 2014, p. 2). A warning was necessary since many policies and programs did not include gender thoroughly enough, if at all. Equivalently, the IFAD around the same time announced that even if rural women farmers are “primary contributors to the world’s food production and security,” they are often “overlooked” and “underestimated” in development policies and strategies (Peterman et al., 2014, p. 2).

Despite the gender-related and intersectional variations in terms of environmental vulnerability and the raising of awareness to the importance of gender in the 1990s, both the UN- FCCC¹⁵ and also the Kyoto Protocol neglect referring the latent issue (Pandey, 2005 in Carvajal-Escobar et al., 2008). Additionally, as stated before the IPCC’s Fourth Assessment Report, *Climate Change 2007*, which is a very important governing body for the UN, lacks to

¹³ Conference of the Parties

¹⁴ Written by the World Bank, Food and Agriculture Organization (FAO), and International Fund for Agriculture Development (IFAD)

¹⁵ United Nations Framework Convention on Climate Change

mention the word *gender*. Likewise, the word *women* is only mentioned once and not in relation to CVC (MacGregor, 2010, p. 2). The lack of mentioning women or gender is appalling for an organization that promotes more sustainable agriculture, since many farmers are also women.

An example from Costa Rica states that even if females are often the managers of farms, “the NCCS¹⁶ fails to consider women producers and gender differences” (Echeverria, 2020, p. 99). The strategy continues to not reflect on how females and males’ “vulnerability can be linked to gender or other inequalities,” nor “their particular needs” (Echeverria, 2020, p. 99). Moreover, in Nepal, Tamang et al., describes that “72.8 per cent of women and 60.2 per cent of men” were both actively involved and engaged with agricultural activities in 2010, but the women are not mentioned and acknowledged in policies (Tamang et al., 2014, p. 24).

8.2 Critique on Current Gendered Focus

The following section offers a critique on the current gendered focus.

8.2.1 Binary Focus of Gender

Many articles follow the narrow binary analysis by only focusing on the man and woman gender dynamics. The implementation of policies can spiral downwards, and development programs can fail. It is logical that a wealthy woman farmer’s livelihood has more in common with a wealthy male farmer than they might with a more vulnerable female farmer (Carr & Thompson, 2014). This narrow binary approach is “treated as unitary categories with contrasting needs” (Carr & Thompson, 2014, p. 183). Moreover, CVC has different effects on for example, “women and men, ethnic groups, social classes, age groups” and many more (Carvajal-Escobar et al., 2008, p. 277). These should all be taken into consideration within the context specific spheres.

If policies and programs include gender aspects it is hard to implement the same issues for various regions and communities, hence a very gender specific focus should be kept. However, giving more authority to women can potentially negatively impact the gender relations of these participants. Which all should be carefully considered and taken into account. Besides, Huynh & Resurreccion pointed out that the existing development policies could increase inequality in for example “resource access” which could add to further marginalizing groups of especially women (2014, p. 226).

8.2.2 Context Specific Focus

Policies from the past decades have often used a once-size-fits-all approach to gender. In comparison, the more context specific and sensitive methods will “more effectively address women’s (and men’s) differential needs and unequal relations and circumstances” (Huynh & Resurreccion, 2014, p. 227). The gendered dynamics and systems are obscure and influenced and changed through local values and norms (Aker et al., 2017). Looking from a more intersectional approach, the researchers and policy makers should pay closer attention to the social and gender dimensions in CVC and other development programs.

Huynh & Resurreccion state it as follows: there should be “a particular emphasis on unpacking the underlying causes of differentiated dynamics for an effective implementation

¹⁶ The National Climate Change Strategy

of future adaptation measures in practice” (2014, p. 227). The context specific gender analysis should:

“include descriptive statistics on the status of females and males, idea ideally disaggregated by age, income, ethnicity, race, disability status, location, lesbian, gay, bisexual and transgender” (LGBTQIA+) or other “socially relevant category as appropriate” (Carr & Thompson, 2014, p. 187).

A good tool to examine gender mainstreaming is the PFE that analyzes gendered dynamics of environmental change by “integrating subjectivities, scales, places, spaces, ecological change and power relations” (Sultana, 2014, p. 374).

8.2.3 More Participatory Processes

One of the ways governments, organizations and policy makers can include a more gender sensitive approach is through participatory processes (Gumucio & Rueda, 2015). If the participatory processes are executed correctly and address the underlying dynamics of gender differentiation for specific contexts, one should be in the highest grade of the “rubric for degree of gender integration in climate change, agriculture and food security policies,” as seen in table 12 below (Gumucio & Rueda, 2015, p. 47). The rubric is a useful tool for gender mainstreaming in future policy documents and publications. However, the rubrics’ aim is to “enhance the capacity of policy instruments” to address gender considerations and not so much “to measure the mere mention of gender” (Gumucio & Rueda, 2015, p. 46).

Grade	Level of gender integration
Grade 1	No reference to gender issues
Grade 2	Gender mentioned in overall objectives but absent from subsequent implementation levels
Grade 3	Gender clearly presented as one relevant entry point in relation to main objective, but absence of clear road map leading to implementation
Grade 4	Gender included in action plan, but absence of clear earmarked resources for implementation
Grade 5	Gender included in document from objective down to action plan, with clear resources identified for implementation

Table 12: Useful Rubric To see the extend of gender integration (Gumucio & Rueda, 2015, p. 47)

Additionally, for a gender inclusive approach to policy making, Gumucio and Rueda found that policies must rely on:

“data and research that specifically identifies gender differences and trends; inclusive consultation processes with diverse stakeholders; and specific funds allocated for the implementation of gender-sensitive policies and the monitoring and evaluation of same.” (2015, p. 58-59).

Besides using a rubric and a more intersectional feminist ecological approach, one can look at the household-levels and community levels through qualitative, quantitative and a mixed-method approaches. In 2011, the CCAFS¹⁷ developed a “more comprehensive approach to measuring gender and CVC” related issues (Kristjanso et al., 2017, 492). All together these more gender-transformative approaches help to:

“examine, question, and influence gender norms and power imbalances, through an enhanced awareness among men and women of gender roles, enhancing the position of women and changing the distribution of resources and roles played by men and women” (Morgan, 2014 in Kristjanso et al., 2017, p. 492).

A more gender mainstreaming approach into the climate discussions is necessary in order to become more sustainable and resilient (Alston, 2014 in Adzawla et al., 2019).

8.2.4 An Example from Bolivia

Boyd gives the example of a climate mitigation project based in Bolivia, where the “male-dominated social organization is reinforced by Western scientific and development approaches” and the project activities are “predominantly targeted towards men” (2002, p. 76). There was a lack of focus in community meetings and in the project context that focused on the “socio-political and economic roles of women in decision-making,” “their relationship with their environment” and issues or concerns raised by them were “pushed down the list of priorities” (Boyd, 2002, p. 76). Moreover, women farmers were “rarely” present at workshops and meetings about forestry programming (Boyd, 2002, p. 73). Within this context, women might start to doubt their ability to improve the situation. A policy that involves predominantly men, reinforced the character of more vulnerable women. The article stated that women would often say, “my husband knows about these issues – he attends meetings” meaning the women lacked a voice, agency, and assume their husbands know best. However, the more marginalized men within the Bolivian farmer community, also lacked a chance of giving more input in the meetings.

8.2.7 Examples China and India

In China and India there is an increasing feminization of agriculture, but women are not perceived as farmers or landowners. This results in women doing adequate amounts of farm work, but the new policies and technologies “are directed towards men, even if women are traditionally more responsible” (Kelkar, 2009, p. 18). Additionally, both policies and institutions nowadays still fail to promote and realize that if “women control the rights to incomes and resources” was taken into account their economic security this would “help boost growth and development” for the food and agricultural sector as a whole (Kelkar, 2009, p. 16). In the future, not only should the implementation of policies become more gender focused, “associated budgeting should also be based on gender equality goals” (Gumucio & Rueda, 2015, p. 46)

¹⁷ Research Program on Climate Change, Agriculture and Food Security

Chapter 9: A Case Study of the Rice Sector in Viet Nam

The following section focusses on the rice sector in Viet Nam, since this was the intended fieldwork area and research had already been done in this context. Rice is the countries largest exports and main production crop, however the rice fields are in decline, “1970-1990 to 1990-2005, annual growth in rice production declined from 3.4 to 2.6% in Southeast Asia and from 2.7 to 1.7% in South Asia” which all increased in the past 10 years (Romero-Paris, 2004, p. 4). In Viet Nam and many South-East Asian nations, the yielding and production of rice is a family effort and business (Galina & Rozel Farnworth, 2016; Rola-Rubzen, 2010).

Sub-Questions	Answer	References
1. What are the impacts of CVC on smallholder rice agriculture?	<ul style="list-style-type: none"> ▪ Many regions of Viet Nam are prone to sea level rise and more extreme weather events as storms ▪ Viet Nam is projected to be very affected by CVC. ▪ The devastation of the agriculture is even worse there since 70% of the population lives in the countryside, and 60% rely on agriculture production for their livelihoods and their families. 	Ylipaa et al., 2019; Huynh & Resurreccion, 2014
2. What is the importance of smallholder women in rice production in Viet Nam?	<p>Rice in general:</p> <ul style="list-style-type: none"> ▪ “In the world’s major rice producing and exporting regions therefore almost half of agricultural workers are women” (Agarwal, 2011, p. 6). <p>In Viet Nam: A report by the UN Women showed that in Viet Nam, 63.4 percent of rural women are involved daily within the agricultural sector.</p> <ul style="list-style-type: none"> ▪ Even if many SHF are considered a family business, women tend to take up a large part of the labor. ▪ Moreover, “regarding family labor distribution in rice production, women generally have a higher input than men” (Chi TTN et al., 2010, p. 212). ▪ Urbanization and devaluation of farming causes farming livelihoods to become more feminized. ▪ Growing feminization of agrarian communities. ▪ Rural women occupy two-thirds of “rural labor force in agriculture” are “crucial for subsistence and food security” (Huynh & Resurreccion, 2014, p. 226). 	Chi TTN et al., 2010, p. 212; Galina & Rozel Farnworth, 2016; UNW, 2014; Ylipaa et al., 2019; Huynh & Resurreccion, 2014
3. What are the traditional gendered roles and tasks in agriculture and how did this change with CVC?	<p>See Figure 4 below.</p> <p>In Viet Nam:</p> <ul style="list-style-type: none"> ▪ The heavy and more delicate responsibilities are a “result of cultural notions that men should work less” but instead have “physically heavier tasks” this translates into women having more work on a daily basis, but their tasks are weighed and “considered lighter” (Ylipaa et al., 2019, p. 9). ▪ The divided tasks by gender are often galvanized upon the notion of “natural abilities,” where the genders naturally seem to be fitted for certain tasks (“women skilled for housework/petty trading and men for strategic planning”) (Ylipaa et al., 2019, p. 6). ▪ Besides working on the rice paddies, females often take care of the other livelihood activities. Examples of these include “animal husbandry, house stead gardening, small trading and up-land crop production” (Chi et al. 2010 in Paris, 2009). ▪ women also work outside the household, and farm productivity in order to ensure the stability of the earnings. This could be in the form of trading or other labor. These non-rice related activities often make for extra crucial earnings for rural women, for example small trading businesses. 	Chi et al., 2010; Ylipaa et al., 2019; Kabeer and Thi, 2000; Ha et al., 2015; Huvio, 1998; Jha, 2004; Gallina & Rozel, 2016; Rola-Rubzen, 2010; Huynh & Resurreccion, 2014; Akter et al., 2017

	<ul style="list-style-type: none"> ▪ Especially with regard to the livestock production, women are important cultural decision-makers. ▪ The women are able to make decisions within the household and their main role is to do the household budgeting (Kabeer and Thi 2000). Women then hold the main responsibility for safeguarding the money and “controlling overall household expenditures” (Gallina & Rozel, 2016). However, this can also be seen as a burden, because when money runs low, women have to find other ways to borrow money. <p>“Should household monies be limited, they bear significant responsibility to (1) find ways to borrow and repay money lenders or friends, (2) look for other income-generating activities, and (3) engage in cost-savings activities” (Paris et al. 2009; Chi 2010 in Gallina & Rozel 2016).</p> <ul style="list-style-type: none"> ▪ However, besides taking care of their own family’s needs, women in Viet Nam are in charge of cooking lunch for hired laborers since this is also seen as their responsibilities. ▪ With regard to agricultural finances, Ylipaa et al., found that Vietnamese women take the role of ‘accountants’ for daily transactions, while the men are ‘managers’ of “strategic purchases, investments and business expansion” (2019, p. 7). <p>Not only women</p> <ul style="list-style-type: none"> ▪ the Vietnamese elderly help with household chores because the “weaker people” managed the more “feminine” tasks (Ylipaa et al., 2019, p. 6). <p>After CVC</p> <ul style="list-style-type: none"> ▪ Women take a leading role in agricultural production tasks, whereas the males of the household tend to “men moved to work in non-agricultural sectors” (Thinh, 2009 in Ha et al., 2015, p. 36). Women have less mobilities and opportunities ▪ In addition to agricultural practices, women are often in charge of many of the household responsibilities, including taking care of the children and the majority of the housework. The triple burden increases. <p>Female/male headed households</p> <ul style="list-style-type: none"> ▪ In male-headed households, the males and females both spend time irrigating the rice fields. But for women-headed households this particular task is often too much, especially during periods of water scarcity and “female heads have de facto limited irrigation water rights especially during periods of water stress because: <p>(i) “they are not able to compete physically with male farmers and their spouses at channelling water to their fields and/or</p> <p>(ii) they have difficulty devoting time and labour for irrigating fields due to their domestic workloads.” (Huynh & Resurreccion, 2014 , p. 231)</p>	
<p>4. Which gender is most vulnerable in regard to CVC and why?</p> <p>5. Which genders have the lowest accesses to CVC adaptation strategies?</p>	<p>In Viet Nam:</p> <ul style="list-style-type: none"> ▪ Women are culturally not perceived as farmers and face discrimination. ▪ despite the crucial role females have in the production, cultivation and exportation of rice, and the role in decision making about budgeting, they are “overlooked by many institutional actors” (Gallina & Rozel, 2016, 9). ▪ Even if women are very important, wage gaps remain, “as male laborers are expected to be more productive” (Chi et al., 2010). ▪ Rural women are said to be the most vulnerable to CVC change because of “their resource dependency and weak capacity to adapt” (Huynh & Resurreccion, 2014, p. 226). <p>Lack of education:</p> <ul style="list-style-type: none"> ▪ An education, and have low vocational skills, which according to the International Labour Organization is at 86.5 percent in Viet Nam (ILO, 2011). ▪ Huynh & Resurreccion found that Vietnamese women with a higher level of education level are “likely to be self-employed” whereas women with a lower education “were more likely to engage in waged labor activities” (2014, p. 234). <p>Underpaid</p> <ul style="list-style-type: none"> ▪ The women cultivators remain underpaid and have a low income compared to their male relatives. Males gain higher payment for the same tasks, because of (believed) more physical endurance/strength. 	<p>Chi TTN et al., 2010; Galina & Rozel Farnworth, 2016; ILO, 2011; Ylipaa et al., 2019; Rola-Rubzen, 2010; Thi et al., 2019; Ha et al., 2015; Huynh & Resurreccion, 2014</p>

	<ul style="list-style-type: none"> ▪ With regard to agricultural finances, Ylipaa et al., found that women take the role of ‘accountants’ for daily transactions, while the men are ‘managers’ of “strategic purchases, investments and business expansion” (9). <p>Lack of access</p> <ul style="list-style-type: none"> ▪ There is a “lack of access to new seed varieties” and women lack the “technique knowledge” for improving their crop management with increasing CVC effects (Rola-Rubzen, 2010, p. 33). ▪ Besides the lack of these accesses, these women tend to face “high costs of seed, fertilizer and chemicals” and lack the knowledge of how to operate them (ibid). ▪ Husbands remain the head decision maker in “resource use” and “head of the household” (Ha et al., 2015, p. 36). ▪ Women are not aware of technical knowledge and skills since they are excluded from local training/agricultural extension activities & “not giving any guidance to agriculturally related technology” (Chi TTN et al., 2010, p. 210).¹⁸ ▪ Little or no access to credit. <p>Public/private sphere</p> <ul style="list-style-type: none"> ▪ Within the rice sector in Viet Nam, rural organizations are mostly dominated by men. ▪ Males are more involved within the public sphere, because of “extensive memberships” whereas the women are only able to access women associations. ““women are portrayed as housewives and their workplace is the domestic or private sphere, while men, or husbands, are involved in the public sphere” (Chi TTN et al., 2010, p. 204). <p>Technical information</p> <ul style="list-style-type: none"> ▪ Women mostly “obtain technical information primarily from more informal channels such as “television, radio, village loudspeakers, their husbands, experienced old men, male neighbors, relatives or other women” (Galine & Rozel Farnworth, 2016, p. 17). <p>More inequalities</p> <ul style="list-style-type: none"> ▪ The growing feminization of the agricultural communities leads to more inequalities, “especially for older women” since their responsibilities are growing but they “lack the rights associated with farm management” (Ylipaa et al., 2019, p. 9). ▪ This together leads to “limited occupational and economic statuses” of most women and in turn a low social status (Thi et al., 2019, p. 4). <p>Agency</p> <ul style="list-style-type: none"> ▪ women are empowered through women’s organizations and women’s associations that are found in many villages (Chi TTN et al., 2010). So, women do get some form of empowerment through women’s organizations, but not as much as males.¹⁹ ▪ Moreover, the female cultivators are the “principal decision-makers regarding the allocation of household financial resources” (Galina & Rozel Farnworth, 2016, p. 19). Meaning the women do have a quite some agency in regard to household/domestic responsibilities and expenses. 	
<p>6.How are different gendered farmers represented</p>	<ul style="list-style-type: none"> ▪ The government has made crucial progress for women in agrarian communities by providing “access to productive resources, better health care, improve income, and education” all to decrease gender inequality (Thi et al., 2019, p. 4). Unfortunately, the main factor that can improve the life or rural women is dependent on natural resources. These natural resources are becoming scarcer because of CVC. 	<p>Kabeer, 2003; Liu 2004, Ha et al., 2015; Thi et al., 2019; Huynh &</p>

¹⁸ “Women, who did not have access to the market and technology information, felt disadvantaged. They felt they lacked a right and were only subordinated to their husbands. Men have privileged access to market and technology information, as they go out to have meetings and also have a more direct contact with different technical staff.”(Chi et al., 2010, p. 211)

¹⁹ Membership in organizations: “more male farmers were members of IPM Clubs (Integrated Pest Management Club), Animal Husbandry Clubs, Fishery Clubs, Co-operatives, Farmers’ Association, and Extension groups than female farmers. Female farmers were only members of the Women Association” (Chi TTN et al., 2010, p. 210)

<p>and included in policies?</p>	<ul style="list-style-type: none"> ▪ The NTPRCC²⁰ is “blind to issues of women’s differentiated adaptive capacity and vulnerability” (Huynh, p. 226). ▪ Even if the government aimed to promote more gender equality within existing farming structures, there is still a large gender imbalance (Kabeer, 2003; Liu 2004, Ha et al., 2015). ▪ The development policies in place today, can cause for further marginalization and inequalities in resource access: “especially female heads of households” (Huynh, p. 226). ▪ “differences including gender, class, household headship, age and stage of life shape women’s differentiated experiences in vulnerability in access to water, to forestland and credit; in turn mark their adaptation differentiation to climate-related agricultural water scarcity.” (Huynh & Ressurreccion, 2014, p. 226). <p>Solutions</p> <ul style="list-style-type: none"> ▪ CVC policies need to not be a one-size-fits all but rather more context specific and address both women’s and men’s unequal relations/circumstances. ▪ There needs to be a better look at the social and gender dimensions in CVC and an inclusion of the “underlying causes of differentiated dynamics for an effective implementation of future adaptation measures in practice” (Huynh, 226). ▪ “Household headship, age, education, credit access and class enabled or narrowed the attempts of particular women to diversify their livelihoods, and to secure them as well” (Huynh & Ressurreccion, 2014, p. 226). 	<p>Resurreccion, 2014</p>
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Box 4: Case Study of Rice Sector in Viet Nam

9.1.1 Tasks and Responsibilities

It is interesting to see that tasks in South-East Asia and Viet Nam are divided per gender. Whereas, women in Africa and most of Latin American perform the same tasks as their male counterparts. Moreover, the north of Viet Nam and the south have different gender roles in regard to agriculture production. In North Viet Nam, more women take on the roles of husbands because of out-migration to the cities. The previously traditional male tasks such as “irrigating the fields, spraying chemicals, and hauling and marketing of farm products” are taken over by women (Paris et al, 2009, 1). In the South, the labor process is “gender sequential,” where women and men work separately on their own rice cultivation tasks (Gallina & Rozel, 2016). Tasks are divided between male and females, and there are shared undertakings as seen in the figure below.

²⁰ National Target Program to Respond to Climate Change of Vietnam

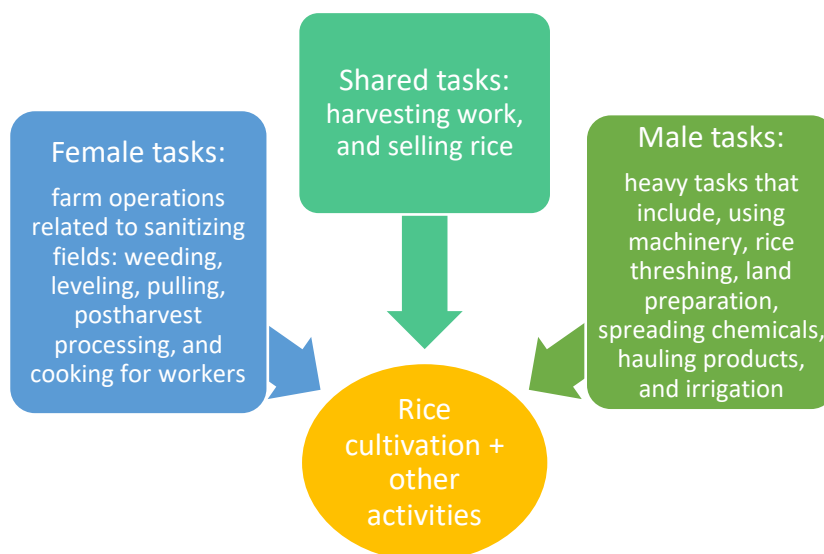


Figure 4: The distribution of rice cultivation among genders (Gallina & Rozel, 2016, p. 12-13; Paris et al., 2009; Tuan et al., 2001).

9.1.2 CVC and Increased Vulnerability

Since Viet Nam shifted to a market economy in 1986, the vulnerability of women through CVC-related risks “is exacerbated by uneven and unequal consequences of institutional and socio-economic changer” (Huynh & Resurreccion, 2014, P. 226). The specific tasks and especially irrigation of the fields reflect “a part of systematic gender inequalities and rights to water sources” since on paper both genders are seen as farmers, but in reality, the “exercise water use rights for irrigation” are only for men or men and women together so a single-headed female household this causes extra stress, difficulties and burdens (Huynh & Resurreccion, 2014, p. 231).

9.1.3 Example of Gender Inequalities in Loans

Moreover, after outmigration of principal males, many women take over farm responsibilities and take up loans in order to compensate for the reduced income of the rice fields. With this loan, they often increase their livestock numbers or set up a small shop to earn a bit more. But taking up a loan is only accessible by “holding a legal land title (red book)” but also depends on showing “evidence of an ‘heir’” (Huynh & Resurreccion, 2014, p. 232). Even when couple farmers sign up for this, the woman lacks these rights without approval from their husbands. So, if a single-women farmer tries to get a loan, this is often almost impossible. In addition, even if they had legal land rights, “not all of them could declare an ‘heir,’ thus banks refused to offer them loans” (Huynh & Resurreccion, 2014, p. 232).

9.1.4 Concluding Remarks

The case study of Viet Nam shows that in this specific context, women are very important in order to sustain food security but face many disadvantages through social and cultural barriers in order to become less vulnerable and able to become climate resilient. Compared to other studies, women in Viet Nam tend to have a substantial amount of agency, responsibility and acknowledgement, but are still most vulnerable. Even if the government made crucial

improvements for women, they still tend to be seen as a homogeneous group that adapt to CVC in the same way. And as Huynh and Resurreccion state, “as a result of this oversight, existing adaptation programs and policies are running the risk of further marginalizing certain types of women” (Huynh & Resurreccion, 2014, p. 226).

Chapter 10: Discussion

The current SLR added to the discussion between CVC and gender for smallholder farmers in the Global South. It is clear that small scale farmers, especially single-headed women households will have more difficulties in the future as the CVC impacts keep increasing. This thesis adds to the link between CVC and gender and concludes the two are not mutually exclusive. Moreover, this thesis focused on the vulnerability of women cultivators their tasks and burdens and lack of accesses. By using 56 different articles, the aim was to create a broad overview of gendered farmer roles, the vulnerabilities and climate impacts faced, together with changing gender dynamics. It is clear women are often more vulnerable to CVC impacts due to their socially constructed roles, within the reproductive and domestic sphere. These women often lack agency and accesses to become more resilient without the help of male family members. Because of this, their chance to adapt to CVC is lower. Even if in the last 50 years more attention was given to gender, women and marginalized peoples, there is still a lack of focus, research and inclusion on the individual, community and policy levels.

The SRL added to the existing research about gender and CVC. The aim was to create a general and global overview of various case studies available today in the Global South and see what types of research was available, what their focus was and how this adds to the larger debate of CVC’s impact on the gender relations of the smallholder cultivator sector. The discussion below adds three discussion points that need to be taken into account in future research. This current thesis showed that in 56 articles, gender is intertwined with climate change, and in turn leads to more vulnerability and less adaptive capacity for the women. The relevance of this thesis is its adds to the SLR of 56 articles by adding discussion points and critical observations throughout the research and highlights discussion points.

10.1 Critique on Oversimplifications

10.1.1 *‘The Vulnerable Woman’*

Almost all used articles narrow down the concept of gender into a binary standard and an oversimplification of women. Automatically this SLR will discuss that is written in the 56 articles, hence the concept of ‘vulnerable women’ is used too. Future researchers should more be aware of this fact. This oversimplification was noticed by the current thesis writer and some articles from the SRL that are quoted below. It is still very common for researchers to use this oversimplification, which is something many articles do not mention.

This tendency often happens and seems to present women as the most “vulnerable and marginalized victims” (Kaijser & Kronsell, 2014). It is crucial to gain more awareness to challenges women may face due to CVC-related events, the simplification and “polarized representations of men and women” can lead to the presentation of women as “homogeneous passive victims” (Lawson et al., 2017, p. 440; Ravera, 2016). The danger is that women can be seen as passive victims with not much power to change their livelihoods. Furthermore,

when the vulnerable are presented as more passive victims of change they are not likely to be seen as “proactive agents of adaptation” and left out of the discussion (Ravera, 2015, p. 336). Additionally, risks come with reinforcing the stereotypical vulnerability of women in regard to CVC, for example by marginalizing certain groups or leaving other marginalized individuals out. Specific focus is needed in policies and development strategies on gender participation and inclusivity in order to provide a more bottom-up approach.

10.1.2 Not a ‘Homogeneous Group’

Another oversimplification is that women are not a homogeneous group, they have “vast economic, cultural, and social differences between women” and have “differentiating factors as class, caste, kinships, nationality, socio-cultural groups” (Dankelman, 2002, p. 24). These factors should be taken into account when explaining which individual is most vulnerable, since a young girl might be more vulnerable than a middle-aged-woman owning her own farm. In Asia for example, the following identities are interplaying the vulnerability to environmental change, “caste, economic class and gender, shaping differentiated vulnerability to risks and disasters” (Ravera et al., 2016, p. 336). In Africa these can vary and include “access to education, land and credit” that influence the capacity to adapt to decreasing precipitation (Ravera et al., 2016, p. 336). However, most studies, if not all, focus on women as a homogeneous group, and lack focus on intersectional dynamics.

The categorization of *the vulnerable woman* also excludes others that “do not fit in these static categories” and “denies social struggle, contestation, and the complexity of fluidity of identities (Alaimo, 2009 in Kaijser & Kronsell, 2014, p. 421). So, even if women might be more vulnerable in certain situations, “children, elderly, widows and widowers, orphans and long-term sick” individuals can also be vulnerable in situations of more CVC because of their “increasing inability to secure food in times of drought (Nelson & Stathers, 2009, p. 86). Another reason for women’s vulnerability is that with natural disasters, women are expected to “care for the sick” and are less likely to find opportunities to migrate (Momsen, 2019, p. 137).

10.1.3 Binary View of Gender

Almost all articles still focus on the binary male and female view of gender, while in the future studies should take into consideration that gender is also influenced by geographical location, age, income and for example ethnicity. A reason for this might be that the researchers often take over the gender definitions of the local people, which mostly consists of male and female. For example, 22 articles focus on the vulnerability of a simplified woman compared to a man. Moreover, the article by Call & Sellers mentions that, although women are repeatedly being portrayed as being the most vulnerable to CVC, men and boys can likewise face “distinct challenges, as a result of environmental stressors and shocks” (2019, p. 2). Unfortunately, the article does not elaborate on the specific distinctions after the statement.

Moreover, any of the articles focus on different regions, and continents. It is acknowledged that gendered vulnerability varies from region to region. They all came to similar conclusions that women tend to be most vulnerable.

10.2 Implications for Future Research

The above three views need to be taken into more consideration in future research. This thesis aimed to look at gender through an intersectional lens, however, did also focus on the binary aspect of gender as the majority of the 56 articles did. The current thesis added to the climate-gender debate by showing that oversimplification of women, a homogeneous view of women and a binary view of gender are still used today. Future research should be context specific, community specific or even household specific since the gender dimensions vary everywhere. One way to become more transparent and thorough is by using a thorough Feminist Political Ecology approach as seen in the table below.

1. Emphasizing politics and power at different scales
2. Challenging dominant ways of knowing
3. Exploring connections between dimensions of social location and subject formation
4. Understanding complex relations between nature and society

Table 13: The FPE approach (from Elmhirst, 2015)

Keeping this FPE approach in mind, it is also critical to research context specifically. Socially constructed roles are often very context specific and how these intertwine with CVC especially. The “power-relations” that are “determined by social context” should also be taken into account and explored more thoroughly (Ravera et al., 2016, p. 336). Taking an intersectional feminist approach together with FPE is of crucial importance to distinguish these power-dynamics. Researchers should look at “social class, household head gender, age and stages of life” which can all determine the ability of individuals to adapt and respond to CVC events (Ravera et al., 2016, p. 336). There is often an interplay of various identities, which are changing and renegotiated under different conditions (Ravera et al., 2016, p. 347). In the future, gender should be more critically evaluated and monitored to ensure for gender equality. It should be clear that CVC and gender inequalities are cut from the same cloth and are interrelated in many ways.

If women become more involved and gain more authority, the cultural and social norms can change. By having a woman own assets, land or property the gender dynamics can shift dramatically. This therefore should be context specific and done over a longer period of time. It is also true that not every society will acknowledge or accept the important role women could play in battling CVC, since gender norms are often entrenched deeply within societies. But a study in rural India, Bangladesh and Nepal showed that with “independent land rights, women are able to address the local world of male dominance..., stigma and humiliation in case of any transgression of gender norms” (Kelkar, 2009, p. 16). However, in comparison in Ghana, the increase of CVC effects led to an “increase in gender welfare gap among farm households (Adzawla et al., 2019, p. n/a). So, implementing new CVC coping policies and development practices should be done context specific and with a long-term focus in order to minimize the negative gendered consequences.

Chapter 11: Conclusions

11.1 Reflection on Findings

The concept of gender, CVC and smallholder farmers by executing a SLR and studying 56 articles answers the research question:

How does climate variability and change impact smallholder farmers' gender dynamics from the perspective of vulnerability and adaptive capacity in the Global South?

Gender dynamics:	CVC amplifies existing inequalities
Vulnerability:	CVC enhances vulnerability
Adaptive Capacity:	CVC urges communities to become more resilient

In short, CVC highly magnifies and enlarges the vulnerabilities in agricultural areas and consequently exacerbates gender dynamics. By looking from an adaptive perspective, this thesis shows that the high level of vulnerability often leads to less access to adaptation strategies. This urges for more inclusive, resolute and effective adaptive strategies to become more resilient to CVC impacts. Empowerment of gender and the previously marginalized is the key to reduce the vulnerabilities of smallholder farmers and raise adaptive capacity which is shown by the 56 studies and also the Vietnamese case study.

The current thesis comprehensively brings together all insights from 56 studies. Moreover, the thesis adds three discussion points which can be relevant for policy makers, development strategies and future research. Keeping an eye out for 'vulnerable women,' the often-homogenous view of women and the binary concept of gender. A way to improve could be to focus more on the FPE, an intersectional approach and inclusivity.

Since 'man-made' CVC has infiltrated the agricultural world and has devastating effects on the food availability, food quality, food access and in turn the gender and household dynamics of smallholder farmers. The unpredictability and more extreme storms and weather patterns translated to higher vulnerability levels of marginalized communities, and especially women. CVC increased women's responsibilities, tasks and burdens. The increasing workload and dependency burden are only amplified the longer the environmental impacts last. Moreover, the lack of accesses and ownership of women to natural resources and farmland prevent women from reducing vulnerability and leads to economic disadvantages. The social, cultural and economic barriers in place, tend to restrict women's accesses to adaptive capabilities and these statutory and customary laws in place restrict access to becoming more resilient. The lack of access to decision-making, information and knowledge, financials, representation and control over land and education are enlarged by out-migration of youth and males. Furthermore, the social and cultural norms and beliefs are entrenched within society and cause political, social and cultural discriminations. Therefore, CVC assists researchers to see the gender inequalities within the agricultural sector, the importance of previously over-looked individuals, and the intertwined relationship between gender and CVC.

With the increase of CVC related events, and the threats to global food security and COVID-19 impact, women could be at the forefront of implementing new agricultural adaptation strategies. Previously neglected/marginalized farmers should have a key role within the

developmental sector. In order for the world to become more sustainable, there needs to be an inclusion and chance of input from marginalized farmers since they often know different aspects of the arising problem. If these crucial cultivators gain more agency and a voice in community governance, this can lead to a better well-being of not only the household and the community, but also the global food stability globally. In turn, the input of women can lead to more sustainable and resilient adaptation strategies. By looking at gender from a more FPE perspective and view the intersectional differences development agencies can help reduce CVC impacts and increase food security. As the FAO stated:

if women are given the same “access to agricultural resources as men” their harvest “could increase by 20-30 percent” and eventually “the total number of hungry people around the world would be reduced by 12-17 percent (FAO, 2011 in Jost et al., 2016, p. 134).

Therefore, there is a need for a stable, durable and resilient agricultural sector that is backed up by empowered smallholder farmers. Local gender distinctions should be taken into consideration when discussing CVC in order to give the best support for adaptation initiatives. As Ertharin Cousin stated:²¹

“Ending gender inequity is not just the right thing to do, it is the smart thing to do. Because, the FAO tells us giving women farmers access to the resources they need would lift up to 150 million people out of hunger.”

With the increasing CVC impacts and the COVID-19 pandemic, there is an urgent need for stable and sustainable food security sources and with the help of smallholder farmers, this is possible.

Even if 50 years ago statements and treaties were made to help women gain equality, this still not the case today. Nevertheless, the groundwork and foundations to build on have been established. The word farmer might still be socially and culturally be seen as mostly men, the current thesis indicated that without the effort and input of women, the agricultural sector would not be where it is today. The women in the Global South are battling and standing up for their rights more and more. By focusing more on the role women can play in combating CVC and becoming more resilient, the hope is to let them have a voice, input and empowerment and come closer to the concept of equality.

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Appendices

Appendix A: Original Methodology

The first part of the initial research project aimed to start with 50-70 surveys to gain a better understanding of the impact of CVC on the local community and to see if CVC events changed within the past 10 years. However, since quantitative data has generally foreshadowed all women as a homogenous group, there is a lack of a deeper understanding of gender dynamics in the process of climate change adaptation. The research aimed for a more inclusive and transparent approach. Therefore, the second step was to conduct 20-30 qualitative semi-structured interviews that would aim to answer how CVC impacted the daily realities of rice farmers, the potential shift in gender roles and the potential changing intra-household dynamics between family members. This would be done by a gender and the bottom-up approach, allowing the farmers to “express their voices, views, problems, needs, and expectations” with the researcher (Thi, 2019, 6).

The third method was to gain a better understanding of the daily realities and daily lives of the smallholder rice farmers. This would have been executed through a method from ethnography called ‘participant observation’. By visiting multiple families more often, gaining their trust the participant hoped to gain a better understanding of the reality of rice farmers and their daily routines. This was all supposed to be recorded in a field journal, all the daily experiences, insights, conversations, reflections, and cultural differences. Moreover, in the field journal, the tasks of the men, women, children and grandparents would have been written down in order to understand the differences between males and females in their daily tasks.

However, after the spread of pandemic COVID-19, these in-depth-interviews were no longer an option as they would be originally conducted in a face-to-face setting. Together with the lockdown of all touristic places in Vietnam, many restaurants and an increasing xenophobic attitude, it seemed impossible to continue the original research. In addition, after these governmental lockdown implementations took place, the researcher made a trip to the fieldwork setting, but was not received openly and even shouted at. Therefore, it was concluded that there was no safe and transparent environment for both the interviewee, translator and the researcher to conduct a semi-structured interview. Accordingly, changes were made since the intended fieldwork became unrealistic.

Appendix B: Collected Fieldwork

Collected Fieldwork

After being in Vietnam for a month here are some thoughts. The women work very hard here, and many elderly women bike or walk with large amounts of products to sell on the local markets. Many elderly women on bikes wear the famous rice hats, which are very handy in relation to sun, wind, and rain.

During the few weeks in Vietnam, there was not a chance to gather much research data, like the intended surveys and interviews, for the research permit was not yet approved by the provincial and regional governments. However, the current researcher gathered primary data, as photographs and aimed to gain more anthropological and sociological means of data collection.

Some observations made: while driving around on a scooter in Thuy Thanh Village.

Today I went back again, the second time driving through the village (March 7). The first time was with the translators. This time alone on a rented scooter. A few rice fields down the narrow road, a woman was spraying something that could potentially be to keep the animals out. Another woman was standing in the middle of the rice field with her cows, letting them drink from a stream. A whole duck farm in the middle of the rice fields. A bit further more women were working on the rice paddies. Not sure what they were doing but one of them was captured by camera as her silhouette was right in front of the Hue skyline as seen in the photograph below. Sharing the contrast of urbanization and farming. Close together, yet very far apart.



Picture 1: rice paddy and Hue (Wagner, 2020)

Today we went back again, a the third time driving through the village (March 14, 3 days before leaving Vietnam). The people are becoming more and more frightened of foreigners, even if one wears a face mask to cover up. Many rice fields, surrounding the village. Most were filled with rice but no farmers. On some fields a single person was working, first a few men were throwing seeds or fertilizer. This time there were more males working on the field, however most fields remained empty. I wonder how often the people work on the rice farms.

I think its different every season as they have to first plant the rice plants in a smaller areas. I hope to know soon.

Now it seems many are spraying fertilizer or a chemical substance and spreading seeds. Today it were all men at work. In addition, when driving through the village one woman screamed at us, it seemed like a “oh no foreigners don’t spread your corona here” type of scream. I assume it is not possible for me to do interviews anymore and the focus of my research should be on survey information.



Picture 2: woman spraying the rice paddies (Wagner, 2020)

The male below is spreading a substance on the rice paddies.



Picture 2: man throwing substance on rice paddies (Wagner, 2020)

Appendix C: COVID-19 Viet Nam

Vietnam and the Pandemic

It surprises me how much the world has changed in a matter of weeks. The day before we left for Vietnam (February 3rd 2020), I asked the doctor that gave me the final vaccinations, if we should be concerned since we were flying to a country bordering China. The doctor responded with, “more people die of the flu” but gave me a list of possible websites with more information. In the airplane from Moscow to Hanoi, the situation became more serious

as flight attendants were wearing face masks. Once in Vietnam more people were wearing masks, but nothing seemed to be different. The only strange thing was a sign in front of a restaurant as seen in the picture below.



Picture 3: Racism in Hanoi (Wagner, 2020)

We did not notice much in the weeks after. However, the Vietnamese schools, all of them, were closed including the university with who we collaborated. In addition, in some restaurants, before entering, our temperature needed to be measured. In parks, there were billboard with how to wash your hands for 20 seconds or more. Moreover, during the first presentation we gave about our research intentions for our supervisors, mouth masks were spread around, to prevent further spread I assume, it was however, quite difficult to be understood and to understand the comments given. Furthermore, it was also quite challenging to keep a stable breathing pattern. Besides these small measures, Vietnam kept a stable number of 16 infected patients. After 4.5 weeks, things changed rapidly, one British tourist infected many people in a city close to us, slowly the tourist attractions started closing and people became more hostile. In a country with one non-elected communist government, one can only imagine how people believe the propaganda. Vietnamese citizens started to act strange as we walked (with face masks) over the streets, by either looking or walking away (sometimes running), or in the worst case screaming at us.

Appendix D: Analysis Scheme

Systematic Analysis Scheme

Article	When/ where	Themes answered & Relevant Topic(s)	Search term	Memo's and reflections	Answers Q # & Evidence
Climate Change and Gender	Total number: 14				Quotes from text with page number
Momsen, J. (2019). <i>Gender and development</i> . Routledge. Pp. 136-155. Retrieved April 2020	-Gender in rural developing areas -Studies all over the world.	1. What are the gender divisions in agriculture? 2. Smallholder versus large scale producers in regard to gender Relevant topics: -Climate change and challenges for women	Google Scholar <i>climate change rice and gender role</i>	The article is a thorough search of many published researches about the relation women have in developing countries with agriculture. It seems that women have a large role within the agriculture community however seem to not able to help in the decision-	Amount of women in agriculture world wide page 141 3.1.a - poor women are most vulnerable to the loss of natural resources (137) 6.1.C ability to adapt depends on control over land, money, credit and tools, good health, personal mobility (137) 2.1.c In Africa, Turkey, South Korea, Vietnam and Romania women more female labor force in agriculture (141) 2.1.a unreliable statistical evidence of women. Women might be culturally constrained to say they have an economic role (144)

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	Information from 1980-2018	-The vulnerability of women in climate change related situations -Women in agriculture and rural areas		making processes, or have a voice in the policy making processes, which is strange since they do play a large role. This however, depends on the cultures. In Africa women have a large role and some Asian countries. In for example Latin America this is less.	2.1.b The crop/livestock mix on female-operated farms is also different, with the emphasis on production for home use rather than for sale (145) 2.1.a traditional agricultural roles: aboriginals: gathering by women is the major source of food (145) 2.1.c Geographical location: a major explanatory variable in differentiating women's participation in agriculture (147) 2.1.c Areas with many small farms usually have relatively high proportions of women agricultural workers and farmers (147) 2.1.b gender divisions: men undertake the heavy physical labour, while women carry out the repetitious, time consuming tasks (148)
Ihalainen, M., & Sijapati Basnett, B. (2015). Gender and Climate Change: Evidence and Experience. Retrieved May 6 2020	Policy brief with case studies in Bhutan, South Africa, Ghana,	1. gender equality in climate change 2. women farmers around the world	Jstor <i>climate change rice and gender role</i>	Women should not only be viewed as victims, they do often have a voice and a platform, skills and knowledge.	4.1 women are at the forefront of implementing new farming techniques but are often not included in the decision-making process & overlooked. Women often eat last when food is scarce (8) 5 "women they only own 10–20% of agricultural land" In some countries laws deny women from owning land: "If women had equal access to resources (land, education, credit, etc.) as men, 100–150 million fewer people would be hungry" (9) 5. women are often seen as a homogenous group
Chi, T. T. N., Anh, T. T. T., Paris, T., & Duy, L. (2015). The gender dimensions of the relationship between climate change and rice-based farming systems: An exploratory assessment in the Mekong Delta. <i>OmonRice</i> , 20, 109-122. Retrieved April 2020	Deep-flooded, semi-flooded and saline-prone areas in Mekong delta, Vietnam FGDs with 93 women and 112 men	1. Gender roles in rice production 2. Gender dimension of causes and impacts with climate change 3. Awareness of women compared to men (CC) Relevant topics: Difference in coping mechanisms, tasks and awareness between genders in relation to agriculture (rice production) and climate change in Vietnam	Google Scholar <i>climate change rice and gender role</i>	Women are affected most by climate change and carry the heaviest burdens (Vietnam) and do not really benefit from the programs and policies for agricultural change. However, in Vietnam there is still limited information about climate change and the influence on gender dimensions. The study also delves into the effects and awareness of climate change between males and females and resulted in showing that women know more about "germination of seeds or poor growth of seedlings." And males more about "plant photosynthesis" (116). It seems like the women are less educated but do know what is going on in the field and what is changing on the field itself.	3.1.b coping mechanisms differ per gender. Women are more engaged in anticipatory strategies such as storing extra seeds for planting, keeping food products, spending less, resorting to small trading business. Men have more access to information, formal credit (109) 2.1 climate change is not gender neutral 2.2.a within rice households gender roles are based on cultural and social norms 3.2.a women are amongst those that are likely to carry the heaviest burdens 4.1 Migration as coping strategy, men leave, worsens situation for women and children (110) 2.2.c Women participate most in rice production, labor intensive, they work on the field but also in the homes (111) 2.2.d "women's participation is higher in more difficult areas or areas which are more prone to floods and in marginal or small areas" (112) 2.2 Coping mechanisms Table 10 page 119 1.2.b effects of CVC: more rain, Awareness of climate change
Terry, G. (2009). No climate justice without gender justice: an overview of the issues. <i>Gender & Development</i> , 17 (1), 5-18. Retrieved April 2020	Women in rural areas in developing countries Ganges River Basin, Tanzania and Kenya	1. Addressing what vulnerabilities women face within the agricultural sector 2. Short-term coping mechanisms because of climate change for women Relevant topics: Focuses on vulnerable and poor women in relation to agriculture	Jstor <i>climate change rice and gender role</i>	Since women face different barriers, and these women are not involved in the policies of adaptation, they are affected heavily. Lack of inclusion of women means less input, meaning less focus on their problems/issues, potentially increasing the burdens	3.1.a poor women face gender-specific barriers when coping and adapting to CVC and natural disasters (8) 4.1.b In Tanzania and Kenya, women "were constrained by lack of access to financial capital, gender norms that excluded them from the more profitable activities" outside of agriculture (13) 4.1 "people's adaptation strategies can alter intra-household gender relations, to women's disadvantage" (13) 4.1 Women's gendered indigenous knowledge on adaptation 3.1.a Vulnerability of women: lack of assets (financial capital), lower education levels, exclusion from decision-making (14)
Dankelman, I. (2002). Climate change: Learning from gender analysis and women's experiences of organising for sustainable development. Retrieved April 2020		1. The impact of climate change on the environment and on women 2. Indicators of gendered positions Relevant topics: a. Climate related changes for more sustainable development practices	Google Scholar <i>climate change rice and gender role</i>	Women are not homogenous, and every woman, depending on the situation, is impacted differently by climate change. However, more than compared to men.	1.b phenomena of climate change: increasing temperature, ice melting, sea level rise, more extreme precipitation, more droughts (22) + impacts on livelihoods 3.1.b women are not homogenous: "vast economic, cultural, and social differences between women" + "differentiating factors as class, caste, kinships, nationality, socio-cultural groups" (24) 2.1.a climate change is not gender neutral and does not impact women and men the same way (24)

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		b.The gender dimension that is often missing from climate policies			
Gallina, A., & Rozel Farnworth, C. (2016). Gender dynamics in rice-farming households in Vietnam: A literature review. Retrieved April 2020	Rice sector in Vietnam Analysis of literature	1.To give context to the gender roles in rice activities, how they are divided amongst men and women in Vietnam Relevant topics: The article explores the gender roles in rice related activities	Google Scholar <i>climate change rice and gender role</i>	If one values the knowledge women have of developing new technologies/practices one can work towards a better agricultural and sustainable future.	2.2 rice is a family effort, but women do the most labor (12) 2.2 “Women’s responsibility in farm management also includes cooking for workers, visiting the farm, and overseeing the work of hired laborers” 2.2 men are in charge of “heavy tasks” that includes machinery while women conduct the farm operations: “seed cleaning, selection, storing seeds” + “cooking for workers, home domestic tasks” (12) 4.2 rural organizations are dominated by men, and “Women generally obtain technical information primarily from more informal channels such as television, village loudspeakers, radio, their husbands, experienced old men, male neighbors, relatives, and other women” (17) 2.2.a “women farmers are the principal decision-makers regarding the allocation of household financial resources” (19) 2.2 in the north and south tasks differ (already in thesis) 2.2 tasks at home
Jha, N. (2004). Gender and decision making in Balinese agriculture. American Ethnologist, 31(4), 552-572. Retrieved November 2019	Balinese rice farmers	1.The role of women in rice production in Bali 2. Feminist approaches to agricultural research Relevant topics: Focus on a gendered division of labor in Bali	Google Scholar <i>climate change rice and gender role</i>	See previous thesis draft: Women have been neglected from being mentioned in academic research about agriculture in the past decades. The research was mostly from a male perspective only that resulted in a cultural blindness to women farmers and the perception was that all farmers were men. Secondly, there is a growing feminization of agriculture because of the male-outmigration to the larger cities in order to find work. Women are forced to pick up the traditionally male tasks in order to keep the farm running.	The decision-making process about resource management is conducted in the contexts of the agricultural communities the farmers are part off, instead of the individual households 2.2 The males tend to focus on activities as “land preparation, ploughing, irrigation and field-levelling (Jha, 2004, p. 553). 2.2 “Men are no longer considered the sole economic providers of households; their contributions to households vary considerably across cultures and complement the income of women” (553) Women are considered complementary yet subordinate to men in religious and popular discourse, but social writ does not explicitly bar them from decision making in any setting” (554) “In the literature on Southeast Asia, much has been made of the relatively high status of women compared with their counterparts in East or South Asian societies. Robert Winzeler (1974, 1982), for instance, observes that in many Southeast Asian agricultural systems, Bali’s included, neither men nor women dominate” (554)
Rola-Rubzen, M. F. (2010). Chapter 11: Interrelationships between labour outmigration, livelihoods, rice productivity and gender roles. University of Western Australia. 2010 by the International Fund for Agricultural Development (IFAD) Retrieved December 2019	rice-growing villages in the Philippines, Thailand and Viet Nam. A rapid rural appraisal, surveys, FGDs and in-depth interviews	1.Rice productivity gender roles Relevant topics: Rice productivity in relation to the different cultural gender roles attached	Google Scholar <i>climate change rice and gender role</i>	What is the Women’s Empowerment Index (WEI) They are excluded from such activities and from participating in field evaluations of technologies: “(i) a cultural perception that poor rural women are ‘helpers’ and not ‘farmers’, even though they play significant roles in farm activities (crop and livestock husbandry); (ii) failure to classify, enumerate and value unpaid family labour adequately as an important labour force in national statistics; and (iii) lack of consideration of women’s multiple responsibilities in household, childcare and farm responsibilities in planning the venue, time and subject matter content of training activities” (33)	2.2 In many South-East Asian countries, including Viet Nam, the production of rice is a family operation and business by dividing the tasks among the members of the family along their social roles (thesis) 2.2 “Men perform land and seedbed preparation, apply chemical fertilizer, spray pesticides and haul farm products. Women do most of the pulling and transplanting of seedlings, weeding and post-harvest activities” (13) 8. Outmigration of young educated people (24) leaving the older people behind, mostly women 1.2 “Rice farming under rainfed conditions is risky owing to abiotic stresses (e.g. drought, submergence or floods and sodicity/salinity)” (24) 8. “men are increasingly involved in non-farm activities, compared with women, because of their mobility and better opportunities” (25) 2.2 & 8. Outmigration by men: in the long-term. It can change the gender division of labor within a farming household as “the unavailability of principal men and adult sons for ploughing, spraying of pesticides, carrying rice seedlings, hauling paddy after harvest and transporting farm inputs – all of which are time- and energy-intensive – can translate into a marked increase in workload for principal women” (29) 3.2 & 4.2.C women who stay behind face problems managing the farm, “due to lack of access to new seed varieties and of technical knowledge of improved methods of crop management” + high costs of seed, fertilizer and chemicals (33)

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					4.2.B Women are not really aware of technical knowledge and skills because they are often excluded from training and agricultural extension activities. (33)
Nelson, V., Meadows, K., Cannon, T., Morton, J., & Martin, A. (2002). Uncertain predictions, invisible impacts, and the need to mainstream gender in climate change adaptations. Retrieved May 2020	Articles from 1970 onwards	1.Long-term effects of climate change on agriculture and gender relations Relevant topics: Focusses on climate predictions, long-term effects on agriculture, the ecological system and gender relations	Google Scholar <i>climate change rice and gender role</i>	Even if this article is not specifically about agriculture, it does discuss why women in developing countries are more vulnerable to CVC. Moreover, research is still lacking on gender and climate change.	1.1 Long-term climate change will have an impact on agriculture, and ecological and human systems, and is therefore likely to have ramifications for gender relations” (51) 1.1 climate change predictions: higher temp, vulnerable natural systems (coast, islands, mangroves), declining crop fields (52) 3.1.a women are the primary natural resource users and managers (collecting wood, forest products, water) (53) and are most vulnerable by environmental degradation 3.1.a “Households dependent on women’s labor in subsistence/cash cropping/on plantations are also badly affected by storms and droughts” 5. “The impacts of climate change on gender relations have not been widely studied to date – they therefore remain invisible” (58)
Romero-Paris, T. (2004). Women’s roles and needs in changing rural Asia with emphasis on rice-based agriculture. <i>Southeast Asia, 1990(99)</i> , 1990-99. Retrieved May 2020	Rural Asia studied from 1990-1999	1.Importance of women’s role in rice production 2.Gendered tasks in rice production 3.Importance of women in agriculture 4.Impact of climate change on rice Relevant topics: Explores the relation between agriculture as a whole and rice production with a focus on gender	Google Scholar <i>climate change rice and gender role</i>	There is a need for more gender sensitive policies, as women are already under more pressure today, this will only increase in the future. Women seem to have a larger role in Asia, as they have to work on the fields but they also are the main household and domestic worker. Although this also depends on the geographical context	“The proportion of economically active female to total female population ranged from 15- 81% within Southeast Asia; 49 - 98% in South Asia. In other countries in Asia, 69% of the total female population was engaged in agriculture.” (1) In Thailand and Vietnam, the proportion is almost equal. “Cambodia, Lao PDR, Sri Lanka, India, Bhutan, Nepal, Bangladesh, Nepal, Pakistan and China, the number of women employed in agriculture as a percentage of the economically active population is higher than that of men.” (1) 2. Gender roles in Asia vary per region. But preparing meals, and other household tasks + domestic always add on to the rice work. For example, in Bangladesh: women contribute to producing fruits/vegetables, “take care of livestock/poultry, fish cultivation, tree planting and crop processing” which all add to the income of the family (3) 1.2 rice production and fields are declining: “1970-1990 to 1990-2005, annual growth in rice production declined from 3.4 to 2.6% in Southeast Asia and from 2.7 to 1.7% in South Asia” (4). Drought, extreme weather patterns: most impact on women and young children
Denton, F. (2004). Gender and climate change: Giving the “latecomer” a head start. Retrieved April 2020	Senegal and Sahel area	1.Rice production in Africa 2.Consequences of climate change impact genders differently Relevant topics: Focusses on 3 different sectors; agriculture, water and the energy sector that are impacted by climate change by looking at gender implications	Google Scholar <i>climate change rice and gender role (second page)</i>	Women are a substantial part of the agricultural production in the Sahel area where food security is becoming a real problem.	Rice provides: “8 per cent of the food energy for almost 1 billion people” worldwide (44) 2.2 Women are actively involved in rice production in Africa, Asia and Latin America (44) 3.1.a “Women tend to have less access to valuable resources to help them develop their adaptive capacity to potential threats and to avoid or minimise the negative impacts of climate change.” + “Limited access to land and land tenure and poor credit facilities could forestall poverty and hinder adaptive measures.” (48) 8.Some “80 per cent of women are actively engaged in agricultural activities in sub-Saharan Africa” (44)
Mlambo-Ngcuka, P. (2015). Gender, climate change and sustainable development. In Morna C., Dube S., & Makamure L. (Eds.), SADC Gender Protocol 2015 Barometer (pp. 323-351). Johannesburg,	Southern African countries: Mozambique, Zimbabwe, south Africa, Swaziland, Botswana, Madagascar, Seychelles, Malawi,	1.The effects of climate change on women 2.Gender dimensions of climate change Relevant topics: Focusses on gender dimensions of climate change with a focus on African countries and regions	Jstor <i>climate change rice and gender role</i>	Women are in charge of the household, water collection, small food production and often know the first-hand problems of CVC, and should therefore be taken into account in policy making. Young girls might be forced to help at home, instead of going to school which could potentially harm them in the future as they lack behind education wise	3.1.a women are most vulnerable when it comes to CVC because: drought/intermittent rainfall directly affect their tasks of primary producers of food + they often depend on local natural resources for their livelihoods 3.1.a “Women make up 70% of the world’s poor” (323) 8.Women make up “80-90 %” of small-scale farmers in Africa. But only Lesotho has a women minister of agriculture. In Lesotho, in Mafeteng: women and men together work to decline the risk of CVC. Both are in the council and can make decisions (329)

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South Africa: Gender Links. Retrieved April 2020	Mauritius, DRC, Lesotho, Zambia				
Echeverria, C. (2020). Gender and Climate Change in Smallholder Family Farms of Tierra Blanca, Cartago. In Fletcher R., Dowd-Uribe B., & Aistara G. (Eds.)	Tierra Blanca: Costa Rica 22 semi-structured interviews from January to May 2018	1. Gendered rights and responsibilities in agriculture Relevant topics: A feminist political ecology perspective of agriculture tasks, climate change vulnerability and public policies	Jstor <i>climate change rice and gender role</i>	Male and females can be owners of the farm. This makes it more gender inclusive. The manager of the farm is the one that makes the final decisions, regardless of gender.	"In 1990 rural and peasant women were included for the first time in agrarian policies" (89) + climate change is not gender neutral (89) + men and women are not a homogeneous group 2.1.b Farms managed by a male is a family effort, everyone helps out. Farms owned by females, she is the only one doing all the heavy lifting and tasks nor do they hire men (95) 2.1.a women challenge traditional gender roles because they do all tasks. While male owners tend to stick to the roles and do mostly the heavy tasks 2.1 "managing the farm gives the person, regardless of gender, the power to ultimately control and decide over the resources" (96) 4.1.b Even if women are managers of the farm, "The National Climate Change Strategy fails to consider women producers and gender differences, and does not reflect how some women and men's vulnerability can be linked to gender or other inequalities, nor their particular needs" (99)
gender dimensions climate change					
Jost, C., Kyazze, F., Naab, J., Neelormi, S., Kinyangi, J., Zougmore, R., ... & Nelson, S. (2016). Understanding gender dimensions of agriculture and climate change in smallholder farming communities. <i>Climate and Development</i> , 8(2), 133-144. Retrieved April 2020	In Uganda, Ghana and Bangladesh FGDS	1. Existing gender roles in agriculture and farming 2. Changing agricultural gender roles due to climate change Relevant topics: a. How poor and vulnerable farmers are affected by climate change b. Detailed case study of smallholder farmers in Ghana, Bangladesh and Uganda and the gender differences on the farm	Google Scholar <i>gender dimensions climate change</i>	"The gender difference, particularly strong in both Ghana and Bangladesh, is likely due to public extension services conceptualizing the 'farmer' as male while NGOs have identified female farmers' information needs as an otherwise unfilled gap" (140)	4.1.a "Women appear to be less adaptive because of financial or resource constraints, because of male domination in receiving information and extension services and because available adaptation strategies tend to create higher labor loads for women" (133) 1.1 poor and vulnerable smallholder farmers in the global south already experience and can expect increases of climate change patterns (133) 3.1.A "Rural women in particular are reported to be at high risk of negative impacts from CVC bc their household responsibilities (childcare/the collection of fire-wood/water can make women particularly climate-sensitive + because they are taking on more agricultural work as men migrate for labour, because they have less access to agricultural resources such as land, extension services and inputs with which to adapt to variability and change, and because gendered social norms and roles can inhibit women's adaptive capacity" (133) 8. "the increasing role that rural women are playing in smallholder agriculture provides an important opportunity to positively impact food production and security in a changing climate" + estimated: "if rural women had the same access to agricultural resources as men, yields could increase by 20-30% and the total number of hungry people around the world reduced by 12-17%" (134) 4.1.b "Women's access to information appears to be limited by their lack of technology ownership" which is held by the men (141) + "the limited rights of women in terms of land access and ownership" poses a threat to inclusion 2.1.A changes in agricultural practices are occurring mainly within existing gender roles (141)
Carvajal-Escobar, Y., Quintero-Angel, M., & Garcia-Vargas, M. (2008). Fuck Women's role in adapting to climate change and variability. <i>Advances in Geosciences</i> , 14, 277-280. Retrieved May 2020	Previous studies + Valle del Cauca - Colombia	How women adapt to climate change Why women are more vulnerable Focus on climate change and adaptation	Google Scholar <i>Gender climate change agriculture</i>	"women generally understand better the causes and local consequences of changes in the climatic conditions (Rohr, 2007) and have the knowledge and skills for orienting the adaptation process" (277)	8. Same as above: rural small holder farmers have a positive impact on the food production in the CVC changing world 5. "Despite the importance of recognizing gender-related differences, both the United Nations Framework Convention on Climate Change and the Kyoto Protocol fail on referring the issue" (277) 3. women are more vulnerable in disasters 3.1 Even if "generally the poorest populations and marginal groups are impacted the most," "in many parts of the world, women constitute the population most vulnerable to CC and CV, due to certain inequitable conditions and situations that place them at risk bc: 3.1 "they suffer a greater impact in a disaster or emergency; Changes in the workload suggest that disasters increase women's responsibilities in the domestic scene, in many paid and unpaid workplaces, In the post-disaster stage there may also be high levels of violence against women (Enarson,

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					2000); Men frequently emigrate in search for work, leaving a gross part of the processes of response and reconstruction in women's hands" (278) 8. 2. women seek solutions with events associated to CVC: "Generally, women seek solutions to the lack of drinking water, access to health and education, reducing factors of vulnerability of their communities in the face of hydrometeorological events, establishing networks with other women" because "In their professional development or in their domestic activities, women are often in a better position to note certain environmental hazards" (278)
Agarwal, B. (2011). <i>Food crises and gender inequality</i> . United Nations. Department of Economic and Social Affairs. DESA Working Paper No. 107, 1-18. Retrieved April 2020		1.Effects of climate change on agriculture and food crisis 2. Feminization of agriculture and importance of women in agriculture 3.Constraints for women Relevant topics: Nature of the current food crisis with climate change The important role women have as food producers and their constraints	Google Scholar <i>gender dimensions climate change</i>	Since women do not have access to as many job opportunities outside of the farming sector, this remains a large percentage of the income	2008: Asian farmers produced 90 per cent of the world's rice and around 40 per cent of its wheat and total cereals (5) 4.1 "Women workers remain much more dependent on agriculture for survival than male workers, due to their lesser access to non-farm jobs" : "Africa in 2008, for instance, 63 per cent of female workers relative to 48 per cent of male" (5) 2/8.importance of women: "In the world's major rice producing and exporting regions therefore almost half of agricultural workers are women. In Africa, again, women form almost half the agricultural work force" (6) 3.1.a women operate on small farms, or are landless and work for low or no wages on other farms 4.1.b women face social restrictions in order to be a full farmer: "freely procure inputs or sell their produce or hire labour" + males hold the farming contracts
MacGregor, S. (2010). 'Gender and climate change': from impacts to discourses. <i>Journal of the Indian Ocean Region</i> , 6(2), 223-238. Retrieved April 2020	Policy documents Gender documents all over the world	1.The vulnerability of women in relation to climate and environmental change Relevant topics: The article adds to the established research on gender and climate change and fills in the gaps	Google Scholar <i>gender dimensions climate change</i>	There still is a lack of research on gender and climate change, however this was written in 2010 so 10 years later there is a bit more information. Women tend to be most vulnerable in CVC situations, which will only increase in the future. In addition, men should not be left out of the conversation as they are also part of the gender concept.	5.cases of gender blindness in the environmental social sciences in general 5. a lack of gender/women mentioned in IPCC's Fourth Assessment Report Climate Change 2007 3.a women are more affected by environmental degradation due to: "social roles as provisioners/carers and in their social location as the poorest and most vulnerable at the bottom of social hierarchy alongside children" (3) 3. women more affected by CVC because: "travel further for water/firewood, more time growing and gathering food" + when there is a lack of food they tend to feed their children and husband and go without it themselves (3) 3. Women make up 70% of the world's poor, not likely to be involved in decision-making: socially and economically marginalized (3/4) gender- means-women trap: "singular focus on women and little or no mention of men (who are also gendered beings)" (7)
Roehr, U. (2007). <i>Gender, climate change and adaptation. Introduction to the gender dimensions</i> . Both Ends Briefing Paper Series. Retrieved May 6 2020	Research in the developing world	1.The burden of women in agriculture due to climate change 2.Women and natural disasters Relevant topics: Examining why gender is an important factor in climate change debates	Google Scholar <i>gender dimensions climate change</i>	Women need to be taken into account in research and policy making in order to relief them from burdens increasing by CVC	2.1.b Burdens of women that are increased by CVC: household tasks, taking care of children/elderly/sick, securing food, providing clean water. In order to reduce poverty, they look for other income generating activities 5.1 Policies: "because women's organization or gender experts are not involved, women's /gender aspects are hardly addressed" (6) 5.1 Research, international institutions, donor organizations and development departments lack research on women specifically
Steady, F. C. (2014). <i>Women, climate change and liberation in Africa. Race, gender & class</i> , 312-333. Retrieved May 7 2020	Women, environment in Africa	1. Women's threat from environmental degradation and climate change Relevant topics: Examines women and climate change in the context of Africa	Jstor <i>gender dimensions climate change</i>	Women are most vulnerable. But do have some additional advantages that men don't have with for example more knowledge of crops, "As keepers of seeds, women often possess knowledge of a v resources to adapt to varying climate conditions such as resistance to droughts and pests" (326)	3.1.a Women are most vulnerable CVC: seasonal changes: "As major custodians and consumers of natural resources" (1) 2.1.bWomen in Africa "provide the bulk of the labor in agriculture and are major resource managers" + "responsible for subsistence food production, finding of water, fuel, animal husbandry" 4.1.a women have acquired indigenous knowledge that was passed down generations about local resources and farming that males often lack (314) 2.1.a "In the flower industries in countries such as Kenya, Ethiopia and Zambia women provide the major labor force and use pesticides and other chemicals that result in

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					<p>spontaneous abortions, miscarriages, infertility and other reproductive problems” (320)</p> <p>4.1.a “Gender hierarchies result in unequal access to power, strategic resources, education, employment and information. Due to the gender division of labor, women’s spheres of economic activities are more connected with the environment, and are more directly affected by changes in weather pattern. The decrease in food supply affects women’s ability to feed their families, and results in a loss of income and livelihood.” (323)</p> <p>1.1.b “CVC contaminate the water supply, increase pests and diseases, and decrease biomass fuel available for household” (323)</p> <p>3.1.a women are more vulnerable: are most of the environmental refugees, increasing workload, caretakers, dependency burden (323) + Women are particularly vulnerable to poverty (325)</p> <p>4.1.b “women often have greater knowledge of indigenous plant varieties with important nutritional and medicinal values” (325)</p> <p>4.1.a Women are most vulnerable. But do have some additional advantages that men don’t have with for example more knowledge of crops, “As keepers of seeds, women often possess knowledge of a v resources to adapt to varying climate conditions such as resistance to droughts and pests” (326)</p>
<p>Lambrou, Y., & Paina, G. (2006). Gender: the missing component of the response to climate change. Gender and Population Division. <i>Sustainable Development Department, Food and Agriculture Organization of the United Nations (FAO)</i>, Rome, Italy.</p>	<p>Policies and gender all over the world</p>	<p>1. Gender differentiated impacts of climate change</p> <p>Relevant topics: Climate change, the impacts, vulnerabilities, and adaptation challenges with a gender lens</p>	<p>Jstor</p> <p>gender dimensions climate change</p>	<p>Men and women differ in regards to CVC..</p> <p>In order to become more sustainable (farming) one needs to also seek the input of women as they know different sides of the story.</p> <p>In reality, “education increases women’s ability to access relevant information and, importantly, to get their voices through to decision-makers”. (36)</p>	<p>2.1/4.1 “women have a high share of agricultural activities but only little decision-making power or control over inputs and outputs”</p> <p>2.1.b “men are responsible for irrigation and women are usually involved in a very labour-intensive, low-emission subsistence agriculture” (18)</p> <p>2.1.b even if women have their own farms, they often have to consult men in order to “ensure water for their plots” “represent them in meetings”</p> <p>2.1.b women are majority “low-income,” “lower-education,” “diversification of crop and livestock varieties” are not available,</p> <p>3.1.a in conclusion: are more vulnerable to CVC.</p> <p>3.1.a Women are natural resource managers, on top of farmers and “If women are primarily responsible for water collection and household gardens, as a consequence, a drought will probably increase their workload” (21) + increasing migration of males leaves more work + difficult access to resources</p> <p>4..gender aspects have been neglected in regards to CVC (27)</p> <p>4.1.a “women lack ownership or control of resources, access to information and decision making authority” (31) and women have a key role in development, they are not just vulnerable</p> <p>4.1.a In reality, “education increases women’s ability to access relevant information and, importantly, to get their voices through to decision-makers”. (36)</p>
<p>Gender and Agriculture</p>					
<p>Akter, S., Rutsaert, P., Luis, J., Htwe, N. M., San, S. S., Raharjo, B., & Pustika, A. (2017). Women’s empowerment and gender equity in agriculture: A different perspective from Southeast Asia. <i>Food Policy</i>, 69, 270-279.</p>	<p>Myanmar, Thailand, Indonesia and the Philippines. 37 focus group discussions were conducted with 290 women All rice producing areas.</p>	<p>1.The division of agricultural tasks in Asia</p> <p>2.The gender relations within southeast Asia with agriculture</p> <p>Relevant topics: Explores gender inequality in agricultural tasks in Myanmar, Thailand, Indonesia and the Philippines.</p>	<p>Google Scholar</p> <p>Women in agriculture</p>	<p>If women become more empowered, they will help increase the food productivity and the household food security.</p> <p>Gender inequity: “In some communities, women may enjoy considerable decision-making power over production and input while they are disempowered with respect to asset ownership, control over income, or community leadership” (271)</p> <p>Definition of empowerment page 271: capacity, agency and opportunity structure</p>	<p>6.Women’s empowerment is considered a ‘prerequisite’ to achieving global food security.</p> <p>“While women play an active role in agricultural groups in Thailand and in the Philippines, this is predominantly men’s territory in Indonesia and Myanmar.” (270)</p> <p>“In all four countries, women appear to have equal access to productive resources such as land and inputs, and greater control over household income than men.” (270)</p> <p>“Women produce over 50 percent of the world’s food and comprise about 43 percent of the agricultural labor force, both globally and in developing countries” (270)</p> <p>Gender systems are complex; influenced by local norms and values</p> <p>2.1 “women in Southeast Asia are generally more empowered compared with women in other developing regions” (270) bc higher decision making power (household level), control over own earnings</p>

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Retrieved December 2019				4.1.a Women can make decisions alone about the household management things, but in relation to land, they tend to not be able to do this without their husband.	Gender research: A majority of the studies were conducted in Sub Saharan Africa (59%) followed by South Asia (22%). Only 6% of the studies are from Southeast Asia. 4.1.a “The existing empirical studies of the ‘gender in agriculture’ literature consistently reveal that women lack access to and control over resources such as land and capital as well as agricultural inputs and technology such as improved crop varieties, training, information and marketing services. Evidence also suggests that women have an unmanageable workload, they lack access to credit or have no decision making power over credit, and are poorly represented in agricultural and non-agricultural groups and organizations” (271) 2.2 In all study sites, decisions about large expenses are made together (95% cases). (271) 2.2 Tasks Rice men: seedbed and land preparation, fertilizer spraying and pesticide application. Women: preparation of lunch of workers. Together: “including transplanting, weeding, manual harvesting and post-harvest activities” (274)
Fletschner, D., & Kenney, L. (2014). Rural women’s access to financial services: credit, savings, and insurance. In <i>Gender in agriculture</i> (pp. 187-208). Springer, Dordrecht. Retrieved May 2020	Rural women in general	Relevant topics: -Access of rural women to financial services. -Cultural norms -Agricultural settings	Google scholar <i>Gender in agriculture</i>	4.1.a Women tend to have less access to the financials of the farm or the household meaning “without adequate access to loans or insurance, producers who face negative shocks, such as droughts, illness or a significant drop in the prices they receive, can lose some of the few assets they do have” (2) Hence property rights and control over assets help to become more resistant to CVC which many women don’t have access too. Even if women had access they might not be able to process it the same as they often lack the formal education	4.1.b Women are much less likely to: “own land titled under their name, even when their families own land, and are less likely than men to have control over land,” even if the woman owns it (3) (access) + face institutional discrimination 2.1.b “men are responsible for the purchase, sale or pawning of large animals (cows, horses, oxen)” women have “control over small animals such as goats, sheep, poultry and pigs” 4.1.a women don’t have access to the same things as men, like “public transportation,” being obliged to do household tasks getting, formal education, access to “information, institutions, markets” in short; restricted mobility. 4.1.a Paraguay: rural women are 15 to 21 percent less likely than men to have basic information about the financial institutions in their communities 2.1.a “Women are typically responsible for cooking, childcare, laundry, cleaning and the collection of water and fuel wood” (5) + “men are typically in charge of tilling, ploughing, fumigating and selling crops to wholesale traders, and women tend to do most of the animal husbandry and the processing of agricultural or animal products” 86“When women have more influence in their families’ economic decisions, their children are better fed & their families allocate more of their income to food, to health, to education and to children’s clothing” (11)
Alkire, S., Meinzen-Dick, R.S., Peterman, A., Quisumbing, A.R., Seymour, G., Vaz, A., (2013). The women’s empowerment in agriculture index. <i>World Dev.</i> 52, 1–66. Retrieved November 2019	Uses data from the Women’s Empowerment Index (WEAI) and the Gender Parity Index [GPI] + 350 households (625 individuals) in Guatemala and Uganda and 450 households (800 individuals) in Bangladesh	1.How women are/become empowered, gain agency in agriculture Relevant topics: The article discusses many surveys from around the world that focus on empowerment, agency and women in agriculture	Google Scholar <i>Women in agriculture</i>	Definition of empowerment, in agriculture. Is the feminization of agriculture empowering for women? For men? For children? Women can become more involved with the farm and receive more responsibilities but still lack the decision-making process, does that mean they are empowered? The article has good indicators for empowerment, access to, etc.	“Empowerment in agriculture is generally defined as one’s ability to make decisions on matters related to agriculture as well as one’s access to the material and social resources needed to carry out those decisions” (4) Statistics about empowerment in the 3 regions: page 38-46 4.1.b “women who are engaged in decision-making on nonagricultural activities may appear disempowered if they are not involved in agricultural decisions; questions about control over resources and income do not capture many of the nuances behind these domains; the prevalence of decision-making questions mean that female-only households are likely to be empowered (although there may be others, such as parents, in-laws, or children with whom such women also need to negotiate)” (59)
Doss, C., Meinzen-Dick, R., & Theis, S. (2018). Women in agriculture:	Data from all over the world, multiple years	1.Debunks 4 of the myths other articles indicate to be true about women’s role in agriculture	Google Scholar <i>Women in agriculture</i>	Many of the other articles use these myths, I will be careful when writing the thesis if I include these statistics.	Myth 1: 70% of the world’s poor are women Myth 2: Women produce 60–80% of the food Myth 3: Women own 1–2% of the land Myth 4: Women are intrinsically better stewards of the environment

<p>Four myths. Global food security, 16, 69-74.</p> <p>Retrieved May 6 2020</p>		<p>Relevant topics: The article explores 4 common myths about women and agriculture</p>			
<p>Raney, T., Anríquez, G., Croppenstedt, A., Gerosa, S., Lowder, S. K., Matuschke, I., & Skoet, J. (2011). The role of women in agriculture. <i>ESA Working Paper No. 11-02</i>.</p> <p>Retrieved April 2020</p>	<p>Studies all over the developing world</p>	<p>1.Role of women in agriculture throughout the world</p> <p>Relevant topics: Focuses on the role of women in agriculture worldwide</p>	<p>Google Scholar</p> <p><i>Women in agriculture</i></p>	<p>Women do more than just helping or working on the farm, the land, they also mostly work inside the house, take care of the children, get fresh water or firewood, cook, and take care of the livestock.</p>	<p>8.“women comprise about 43 percent of the agricultural labour force globally and in developing countries.” (1)</p> <p>weeding and harvesting were predominantly female activities.</p> <p>8.“women comprise just over 40 percent of the agricultural labour force in the developing world, a figure that has risen slightly since 1980 and ranges from about 20 percent in the Americas to almost 50 percent in Africa” + “global average is dominated by Asia” (3/4)</p> <p>8.That women “women constitute 60 to 80 percent of the agricultural labour force” was made by the UN in 1970s and seems untrue.</p> <p>2.1“unlikely that women produce as much as 60 to 80 percent of the food in developing countries” because this is often together with males, differs per region, not universal</p> <p>2.1“men: constructing housing and herding of grazing animals, and in marketing of products if women's mobility is constrained. Women: take care of eggs, milk and poultry meat for home consumption and they often have control over marketing and the income from these products.” +childcare, household chores (14)</p> <p>2.1 women’s workloads: “estimated that women provide 85 to 90 percent of the time spent on household food processing and preparation across a wide range of countries”(16)</p>
<p>Pattnaik, I., Lahiri-Dutt, K., Lockie, S., & Pritchard, B. (2018). The feminization of agriculture or the feminization of agrarian distress? Tracking the trajectory of women in agriculture in India.</p> <p>Retrieved May 6 2020</p>	<p>India</p> <p>Data from Indian population Census (1981, 1991, 2001 and 2011)</p>	<p>1.Feminization of agriculture with examples from India</p> <p>Relevant topics: Feminization of agriculture with a focus on india</p>	<p>Google Scholar</p> <p><i>Women in agriculture</i></p>	<p>Women are often underpaid for the work they do, this in turn means that a feminization of agriculture is not always empowering for women, but can also be the downfall for some. Moreover, “As women move from occupations that have been poorly- or unremunerated, such as unpaid family labour, their visibility in the public sphere increases, but this might not be reflective of changing positions in the private spheres of household and family.” (2)</p>	<p>3. “women’s growing contribution of labour in agriculture adds to the already heavy work burdens of most rural women, thereby further undermining their well-being, and suggests that the feminization of agriculture may better be described as the feminization of agrarian distress.” (1)</p> <p>2.1 Deepening agrarian crisis in india: men seek jobs elsewhere, the work is left behind for the women. Pressure on women. More work additional to the household responsibilities. (4) Women are often underpaid</p> <p>Definition of the ‘feminization of agriculture’ (3)</p> <p>women “may be denied significant decision-making powers in relation to household assets, lack viable livelihood alternatives, and be forced to under- take economic activities that have been left by men.” (14)</p>
<p>Tamang, S., Paudel, K. P., & Shrestha, K. K. (2014). Feminization of agriculture and its implications for food security in rural Nepal. <i>Journal of Forest and Livelihood</i>, 12(1), 20-32.</p> <p>Retrieved May 6 2020</p>	<p>quantitative + qualitative. Two mid-hill districts of Nepal, Kavrepalanchowk (Kavre) and Lamjung, using both household survey and key informant interview.</p>	<p>1.Agricultural importance of women in Nepal</p> <p>Relevant topics: The importance of the role of women in Nepalese agriculture</p>	<p>Google Scholar</p> <p><i>Women in agriculture</i></p>	<p>Feminization adds more work for the women, off-farm tasks still continue.</p> <p>That women take over the roles of men should have given them more empowerment in the household and the community, however, in Nepal cultural and social factors, “along with a non-supportive policy and institutional environment, have not responded to the need to empower agriculture- dependent women to increase their ownership and control over productive resources.” (29)</p> <p>But this is different in every specific and local context</p>	<p>Feminization: growing out-migration by males.</p> <p>2.1 women in addition now look out for the children & elderly and get additional farming responsibilities “within the traditionally male-dominant farming practices” (20)</p> <p>8. “Women are increasingly adopting less intensive farming practices as well as abandoning agricultural lands. As a result, there is reduction in food production.” (20)</p> <p>Feminization of agriculture: “it as a serious cause of social exclusion and injustice” (20) the youth tends to be more educated and also leaves for larger cities, leaving the mothers and grandmothers behind to work on the farms</p> <p>In nepal: 72.8 per cent of women and 60.2 per cent of men were engaged in agricultural activities in 2010, but they are not mentioned and acknowledged in many policies (24) (7)</p> <p>2.1 In Nepal, “traditionally female members are involved in reproductive work such as looking after children and elderly and working as agricultural labor to secure their livelihoods” (24)</p> <p>“Since there is lack of labor force in rural areas, a combination of factors, particularly women’s engagement in multiple tasks, has led to managing farms without much attention and/or adoption of less-intensive farming with fewer crops in the cropping cycle.” (27)</p>

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					2.1 women: “multiple tasks of production, harvesting and post- harvest processing. They worked as producers, family workers or as agricultural wage laborers” (27)
Kelkar, G. (2009, March). Gender and productive assets: implications of national rural employment guarantee for women’s agency and productivity. Retrieved May 6 2020	India and China study of the available limited literature within academia	1. Feminization of agriculture in India and China Relevant topics: Women, economic independence, economic growth through agriculture	Google Scholar <i>Women in agriculture</i>	“economic security is worsened by the fact that policies and institutions do not realize that promoting of women’s control rights to incomes and resources would help boost growth and development” (16) Not land owners; Women do not feel the need to invest in land, that is not technically theirs, so meaning with CVC they would not invest in land that is owned by their husbands, but if it was their own land they would become more inclined to do so. Women do much of the farm work but are still not perceived as landowners, resulting in many of the policies and new technologies are directed towards men, even if women are traditionally more responsible (18) All in 6	Increasing feminization of agriculture in China and India. But “Women agricultural workers are frequently discriminated against in their livelihood security, education and autonomy” (3) 4.1.a “lack of control over income/assets, lack of ownership and control rights” (3/4) 4. “Social and cultural norms change when women acquire control on land/property/assets:” (in rural Bangladesh, India and Nepal) “With independent land rights, women are able to address the local world of male dominance, and of stigma and humiliation in case of any transgression of gender norms” (16) Asia: “a large proportion of women are not able to retain their earned income (control over, spending) – over 40 per cent in Bangladesh –over 40 per cent in Gujarat –over 70 per cent in Indonesia –in China 57 percent of women reported that they have “greater control than their husband on daily expenditure items. However, on bigger items, only 7 percent of the wives have the greater control of the decisions” (16) which was even less in South Asia 4.1.a “discriminatory barriers and socio-cultural rigidities remain the major reasons blocking women from obtaining effective control of property, assets and resources and restricting their mobility within workplace or employment / self- employment structures” (17) 4.1 “Absence of this security of use rights, women would not invest their own money in improving the land but when women purchased land in their own names, as a number of women had (in Self-Help Groups, Micro-finance projects in rural areas), they were obviously much more secure in their right to the land. To sell it they did not require the husband’s signature” (17) 6. “Women’s ownership and control rights to productive assets (both collective/household based) can lead to higher and better quality production + enable them to have voice in the community governance, planning for creation of productive assets and exercise control over use of household income for the well-being of themselves and other members of the household” (18)
Arora, D., Arango, J., Burkart, S., Chirinda, N., & Twyman, J. (2017). Gender [im] balance in productive and reproductive labor among livestock producers in Colombia: Implications for climate change responses. Retrieved April 2020	qualitative field study in the municipality of Patía in Cauca region of Colombia FGDs and qualitative interviews	1. Traditional male and female tasks in agriculture Relevant topics: The gender differences in livestock, agriculture and climate adaption in Colombia	Google Scholar <i>Women in agriculture</i>	Gender roles used to be a bigger thing, but now since the invention of more agricultural technologies and urbanization (migration) this helped to make the distinction less. Because of CVC many of the women in this region of Columbia worked extra hard in order to get more money to fight against the drought. However, it does not say what the men did.	2.1 land clearing is seen as a male task while weeding is attributed as a female task” (1) women in Africa perform all the tasks performed by men in agriculture (1) 2.1 as a consequence of migration and urbanization, many women have taken up the tasks of their men (1) 2.1 “women perform most of the tasks involved in livestock production” (2) + “in livestock production, women often do the tasks that are close to the home in order to manage the double burden of productive and reproductive work” (1) 4.1.b “Both men and women in FGDs responded that women have a say in livestock production and investment decisions” (2) + in some cases the women represent their husbands at local meetings/community workshops 2.1.a because of CVC women now have stepped up their game and in order to help with financial costs of providing more water (droughts), they “cultivate horticultural crops (lemons), “collect forest resources (mate/cane) for sale,” and work as wage labor on other farms” (3)
Chi TTN, Rundquist FM, Duong C, Jirstrom M. (2010). Gender roles in agricultural diversification in	Can Tho Province in the Mekong delta in Vietnam survey consisted of	1. Gender specific tasks in agriculture in Vietnam 2. Definition of gender RICE Relevant topics:	Google Scholar <i>gender in agriculture</i>	In vietnam, women do get some form of empowerment through womens organizations, but not as much as males. Page 204: gender	4.2 & 2.2 .males have higher education levels, gender specific tasks and activities: both involved in cultivation, males have higher wages, “Male: did rice threshing, land preparation, and hauling, while female family members did hand weeding and rice gap filling, also on other farms as hired laborers. Men contributed more labor and were the main actors in rice production, fruit tree management and in fishery. Women

<p>O Mon and Co Do Districts, Can Tho Province, Mkong Delta, South Vietnam. <i>Omonrice</i> 17:203–219.</p> <p>Retrieved December 2019</p>	<p>170 Household taken from 2005-2006</p>	<p>Analysis of gender in farming households and dynamics</p>		<p>4.2.B Men were more involved in the public sphere because of their extensive memberships, women tended to lack behind as they only had access to the women association: “women are portrayed as housewives and their workplace is the domestic or private sphere, while men, or husbands, are involved in the public sphere” (210)</p> <p>Males receive higher wages for the same tasks as they have more physical strength (page 213)</p>	<p>contributed in upland crop production and husbandry (animals)”(203)</p> <p>4.2.B “Women obtained technical information primarily from television, village loud speakers, radio, leaflets, experienced old men, male neighbors, relatives and other women in the village”</p> <p>2.2 “The male headed and managed-farms made up 89% of all households;” therefore, “labor inputs in rice production were also dominated by men” (208)</p> <p>4.2.B membership in organizations: “more male farmers were members of IPM Clubs (Integrated Pest Management Club), Animal Husbandry Clubs, Fishery Clubs, Co-operatives, Farmers’ Association, and Extension groups than female farmers. Female farmers were only members of the Women Association” (210)</p> <p>4.2.B men went out to seek information, women “not giving any guidance to agriculturally related technology” (210)</p> <p>4.2.B “Women, who did not have access to the market and technology information, felt disadvantaged. They felt they lacked a right and were only subordinated to their husbands. Men have privileged access to market and technology information, as they go out to have meetings and also have a more direct contact with different technical staff.”(211) + no access to credit, or very difficult to get</p> <p>2.2 Labor distribution, “Regarding family labor distribution in rice production, women generally had a higher labor input than men.” (212)</p>
<p>Wrigley-Asante, C., (2014). If women hold up half the sky, how much of the world’s food do they produce? In: Quisumbing (Eds.), <i>Gender in Agriculture</i>. Springer, Netherlands, Chapter 1.</p> <p>Retrieved December 2019</p>	<p>FAO data and analyses of other scholars</p> <p>Case study in China, Ghana, Nicaragua and bosnia-H</p>	<p>I. Gendered inputs in agricultural production</p> <p>Relevant topics: Gendered food production. How much women actually produce.</p>	<p>Google Scholar</p> <p><i>gender in agriculture</i></p>	<p>It is impossible to say how much work women do in the developing world, as they often work together with males.</p> <p>The quote “Women produce between 60 and 80 percent of the food in most developing countries and are responsible for half of the world’s food production” is therefore hard to prove.</p>	<p>2.1 “women do not produce food separately from men and it is impossible to disaggregate men and women’s contributions either in terms of labor supplied or in terms of output produced” (1)</p> <p>4.1 “There is evidence that shows that women farm as productively as men do, when they have access to the same resources. But they often do not have access to the improved technologies, credit, land and other resources.” (1)</p> <p>2.1.c sub-Saharan Africa, is the region where women are typically most involved in agricultural production” (6)</p> <p>6. The data worldwide might not be as accurate to say how many percent of women work in agriculture as for example. “rural women in Latin America are likely to reply that “their home” is their primary responsibility, even if they are heavily engaged in agriculture” (7)</p> <p>“women’s labor in agriculture cannot be neatly separated from their other time uses; neither can it be separated from men’s labor; nor can women’s labor in agriculture be understood properly without also understanding their differential access to land, capital, assets, human capital, and other productive resources” (19)</p>
<p>Anderson, S., & Sriram, V. (2019). Moving beyond Sisyphus in agriculture R&D to be climate smart and not gender blind. <i>Frontiers in Sustainable Food Systems</i>, 3, 84.</p> <p>Retrieved May 27 2020</p>	<p>CCAFS and ASAP program mes</p>	<p>Gender in agriculture</p> <p>Womens vulnerability</p> <p>Women in policies and in climate smart agriculture</p>	<p><i>Scopus:</i></p> <p>(gender AND agriculture AND climate AND change) AND (LIMIT- TO (ACCE SSTYPE(O A)))</p>	<p>Feminization of agriculture is not a good thing. Out-migration and other forms of off-farming practices mean males move away or at least abandon the farm work, leaving women and girls to take up these responsibilities, additionally to the other tasks.</p>	<p>6. Feminization of agriculture has been occurring for some time now. Latin America: evidence from 2005 onwards: due to outmigration of males/off-farm employment: ‘rural women becoming principal farmers (termed own-account workers in agriculture)’ (3) + in Nepal & India in the recent years, large male out migration meaning women take over the farm tasks + their existing household tasks which increases their burden</p> <p>3.1 “Weak control over productive assets (land, water, forests) restricts women’s capabilities to invest in climate adaptive actions or diversify their livelihoods away from climate sensitive areas” + poor recognition of women and girls’ climate vulnerability needs, their participation in climate resilience response decision making is low, and the redistributive actions necessary to address climate vulnerability do not account for the differential needs of women and girls” (3)</p>
<p>Adzawla, W., Azumah, S. B., Anani, P. Y., & Donkoh, S. A. (2019). Gender perspectives of climate change</p>	<p>300 farmers in Ghana in the South Tongu and Zabzugu districts of the Volta</p>	<p>The means of adaptation to climate change with a non-binary view of gender</p>	<p>(gender AND agriculture AND climate AND change) AND (LIMIT-</p>	<p><i>I.I”</i>, Adzawla and Kane (2019) estimated that observable impacts of climate change and variability have led to an increase in gender welfare gap among farm households in northern Ghana. This justifies</p>	<p><i>4.1.a</i> “severer climate impacts on the livelihoods of females than males in Ghana. On the contrary, the adaptive capacity of males was found to be higher than that of females. This was supported by the observed differences in gender climate adaptation where both male heads and male household members had higher mean climate adaptations than both female heads and female household members.”</p>

<p>adaptation in two selected districts of Ghana. <i>Heliyon</i>, 5(11), e02854. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6861575/</p> <p>Retrieved May 27 2020</p>	<p>and Northern regions</p>		<p>TO (ACCE SSTYPE(O A)))</p>	<p>calls for gender mainstreaming into climate discussions (Alston, 2014)."</p>	<p>6. "female heads reported significant severer impacts of climate change on their farms than the other gender groups." 4.1.a "even within the same sex group that often form the basis for gender construction, climate adaptation differs due to the difference in power and responsibility in a household. For instance, while the heads may have overall control over household resources and its usage, they may also have the responsibility to see to the welfare of each household member, which are not the case for individual household members" + " Ironically, the study established that household members in both male and female groups have higher adoption levels than the heads of households. Clearly, household heads have greater household responsibilities to perform in addition to integrating different adaptation strategies into their farm activities which may require extra time and farm work"</p>
<p>Call, M., & Sellers, S. (2019). How does gendered vulnerability shape the adoption and impact of sustainable livelihood interventions in an era of global climate change?.</p> <p>Retrieved May 27 2020</p>	<p>Web of Science and Scopus systematic review of peer-reviewed academic literature</p>	<p>livelihoods policies or interventions that included documentation of gendered impacts. Agriculture</p>	<p>(gender AND agriculture AND climate AND change) AND (LIT-MIT-TO (ACCE SSTYPE(O A)))</p>	<p>"Across low- and middle-income countries, small- holder agriculture remains an important livelihood strategy for over 2.5 billion people" (3) "Rainfed agriculture is the most common agricultural approach among smallholders, and in many regions, the use of fertilizer, mechanization, and improved/ hybrid seeds remains low" so "agricultural productivity—livelihoods of many rural smallholders—is highly vulnerable to the effects of climate change" (3/4) Meaning in order to become more resilient and sustainable, there needs to be a more gender inclusive approach to agricultural policies and implementations</p>	<p>4.gender is one of the most universal and important stratifying elements affecting natural resource use and vulnerability to the effects of climate change Smallholder farms are particularly vulnerable to the effects of climate change (Morton 2007). 2.1 "culturally established roles may involve men and women cultivating different crops (e.g. women cultivating legumes while men grow maize) or taking responsibility for specific parts of the planting and harvesting cycle (e.g. women weed, men till)" (5) 4.1.b "women generally have reduced access to land use and ownership, financial capital, and information in comparison with men + "women are also often faced with the additional burden of house- hold maintenance and childcare alongside agricultural responsibilities" (5) 4. "Nigeria, Malawi, Haiti, and Benin offer examples of cases where women were actually more likely than men to adopt new agricultural technologies" because "these interventions were related to farming activities primarily carried out by women" (6) 4.6. "adoption of new agricultural technologies in Bangladesh and Malawi has been observed to increase women's household decision- making power, women's income, provide more time for girls' education, and improve children's nutritional outcomes" (6) farmers' groups/organizations: in Ethiopia, Malawi, and Ghana: "have typically provided a greater benefit to men than women, in large part because a combination of socio-cultural barriers (e.g. stereotypes of women's ignorance) and limited mobility for women have often prevented women from accessing them" increasing gender inequity HOWEVER, in Mozambique, Malawi, and Ghana: if the participation of women is facilitated through strategies such as gender equity training for men and the use of female extension officers to target women farmers > extension services have the potential to increase the adoption of both agricultural inputs and natural resource management strategies by women" (6)</p>
<p>Chanana-Nag, N., & Aggarwal, P. K. (2018). Woman in agriculture, and climate risks: hotspots for development. <i>Climate Change</i>, 1-15.</p> <p>Retrieved May 27 2020</p>	<p>GIS + The dataset is for 2011 for 641 districts across 29 states and 7 Union Territories from the population census of India</p>	<p>female participation in agriculture and climate risks.</p>	<p>(gender AND agriculture AND climate AND change) AND (LIT-MIT-TO (ACCE SSTYPE(O A)))</p>	<p>CVC is not only impacting women that own/together with their husbands a farm, but also women laborers that work on agricultural lands for someone else for example in India: "97.5 million females in the rural sector, 37.3% work as cultivators and 62.7% as agricultural laborers" (14) + 1.1 "climate change impact not only intensifies poverty, it also strengthens the existing gender inequalities related to access to resources necessary to cope with climate change" (15) Chanana-Nag,</p>	<p>climate change is not gender neutral, and impacts women more adversely than men "Agriculture employs 60% of the total female working population in South Asia (ILO 2016). Women cultivators face multiple constraints for production, including those related to social and gender norms and limited resource access, which are further magnified in the wake of climate change" Not all women dependent on agriculture work on their own lands. 4.1 "lower literacy levels along with sociocultural norms associated with a patriarchal structure limit productivity of female cultivators by inhibiting decision-making and access to key resources including credit, information, and markets" (22) 4.1 Moreover, women have, "limited access to community-based water resources, credit facilities, information, and advisory services among other resources essential to cope with agricultural income loss, further worsen the coping capacity of female farmers in the region, especially poor and marginal laborers" (22)</p>

					4.1 high vulnerability of poor, small, and marginal female cultivators to drought and heat waves as a result of factors, such as lack of access to financial and agricultural resources and increased labour burden” (23)
<p>Huyer, S. (2016). Closing the gender gap in agriculture. Asian Institute of Technology SAGE Publications. Gender, Technology and Development 20(2) 105–116.</p> <p>Retrieved May 27 2020</p>	<p>Literature review</p>	<p>Gender gaps in agriculture</p>	<p>(gender AND agriculture AND climate AND change) AND (LIMIT- TO (ACCE SSTYPE(O A)))</p>	<p>“The question of whether women have control of these resources; whether they participate in use of and decisions around the accrued benefits of increased production and income, and whether resources meet their requirements and priorities, will all determine whether the gender gap in agriculture is closed” (105) huyer</p> <p>See conclusion page 112</p>	<p>6. women’s activities in agriculture are characterised by a global gender gap in vulnerabilities, access to resources, and productivity” (105)</p> <p>6. “Agriculture is the largest employment sector for 60 percent of women in Oceania, Southern Asia, and sub-Saharan Africa, and for 80 percent of women in least developed countries” (106)</p> <p>4.1. a gender gaps in access and control continue to exist in regard to six key resources and inputs for agriculture: land, labor, credit, information, extension, and technology + statutory and customary laws continue to restrict women’s access to land and other assets.</p> <p>6. In nearly a 1/3 of developing countries, laws do not guarantee the same inheritance rights for women and men + in an additional half of countries, discriminatory customary practices against women are found + lack of security of land tenure results in lower access to credit and inputs leading to inefficient land use, reducing yields</p> <p>4.1.6 “Farms run by female-headed households tend to have less labor available for farm work, as these households are typically smaller, and because women have unpaid household duties that take them away from income-generating productive activities, including fetching fuelwood and water. As a result, women are more likely to face time constraints that affect their ability to participate in community-based climate adaptation initiatives or may reject practices that increase their labor burden”</p> <p>SSA: women, lack access to irrigation infrastructure and technologies</p> <p>2.1 women tend to manage household kitchen gardens and small livestock while men have responsibility for commercial crops and large livestock (107)</p> <p>4.1 lower access to information channels, communications technologies</p> <p>6. Rural women, in particular, are at high risk of negative impacts from climate change due to increases in both household responsibilities and agricultural work from male out-migration.</p> <p>6. “Women are also important agents of innovation in response to climate-induced change (Denton, 2002). Their resilience strategies and local environmental knowledge are valuable resources for recovery and adaptation” (108)</p>
<p>Lawson a, E. T., Alare, R. S., Salifu, A. R. Z., & Thompson-Hall, M. (2019). Dealing with climate change in semi-arid Ghana: understanding intersectional perceptions and adaptation strategies of women farmers. <i>GeoJournal</i>, 1-14.</p> <p>Retrieved May 27 2020</p>	<p>women smallholder farmers from semi-arid Ghana in Lawra and Nandom districts + 103 women farmers using semi-structured interviews, focus group discussions and key informant interviews</p>	<p>Impact of CVC on smallholder women farmers</p> <p>How different farmer women perceive CVC</p>	<p>(gender AND agriculture AND climate AND change) AND (LIMIT- TO (ACCE SSTYPE(O A)))</p>	<p>“Recent critiques from feminist political ecology perspectives have also questioned the soundness of the binary male–female view of gender in climate change studies which often underplay power relations which are frequently mediated at the household level and vary with geographical location, and are determined by a host of other social markers like age, income, and ethnicity” (440)</p> <p>However, due to limitations, the current research will still focus on the binary view of gender + most of the articles still only focus on men and women not the diversity in between.</p>	<p>1.1 “Key climatic impacts in semi-arid areas include increasing temperatures, dry spells, changes in timing of the onset and ending of rainy seasons and changes in lengths of crop growing periods. These changes will affect agricultural production and threaten household food security” (439)</p> <p>“whilst it is important to draw attention to the challenges women face in adapting to climate change and other climate related risks, simplistic and polarized representations of men and women rather lead to presenting women as a group of homogeneous “passive victims.” (440)</p> <p>4.1” Age, marital status and migrant status have been identified as significant social factors in the case study areas. They influence the extent of access to and ownership of land, the most important economic and natural resource on which survival of most households depends.” (443)</p> <p>4.1. Adaptation: “mixed farming is an important adaptation strategy for most farmers in Africa + an important source of additional income for families & the 2 main socio-economic strategies adopted to generate additional income included petty trading and out-migration.” BUT “Migration was occasionally adopted by relatively younger women between 20 and 30 years” NOT BY MEN (445)</p> <p>Being married helped to influenced the choice of adaptation strategy” because “most married women had better access to information, land and agricultural input through their husbands and they shared this information among themselves” (445)</p>

					<p>6. “Women farmers between the ages of 31–50 years perceived more changes in temperature and rainfall compared to the other age groups.” (448) so women know the field, what changes and can help bring about more sustainable agricultural techniques</p> <p>4.1 “Access to land is critical to adaptation in the study areas as it is linked to vulnerability, livelihoods and food security” (448) which is mentioned in many of the other articles</p> <p>4.1 “formal education to senior high and tertiary levels influenced adaptation options. Low levels of education limit the ability of people to gain extra employment opportunities particularly in the non-farm sector” which many of the women lacked (449)</p>
<p>Ravera, F., Martín-López, B., Pascual, U., & Drucker, A. (2016). The diversity of gendered adaptation strategies to climate change of Indian farmers: A feminist intersectional approach. <i>Ambio</i>, 45(3), 335-351.</p> <p>Retrieved May 27 2020</p>	<p>Indian Gangetic mid-plains regio: Bihar and Uttarakhand</p> <p>Data collection between July and December 2012 in-depth interviews + FGDs + field surveys</p>	<p>Climate change adaptation and other gender limitations faced.</p> <p>Using the intersectionality approach.</p>	<p>(gender AND agriculture AND climate AND change) AND (LIT-MIT-TO (ACCE SSTYPE(OA)))</p>	<p>Women are more vulnerable, often, in situations of CVC. But as this is the second article that mentions: the binary perception of gender is not efficient. As this perception can lack: “lack sufficient consideration of power relations determined by the social context” (336)</p> <p>In India for example, there is also a differentiation of CVC adaptation by for example cast.</p>	<p>3.1 “usually women are more vulnerable to CVC due to their dependence on natural resources and structural inequity in their access and control of such resources” (335)</p> <p>Because (1) presents women with no power, passive (2) homogenous group (3) climate change acts alone. Which is all false.</p> <p>Intersectional feminism and its importance on page 336</p> <p>the interplay of multiple identities:</p> <p>Asian: “caste, economic class and gender, shaping differentiated vulnerability to risks and disasters”</p> <p>“social class, household head gender, age and stage of life may determine women’s ability to respond to water scarcity”</p> <p>Africa: “access to education, land and credit are analysed as local determinants of the capacity to adapt to decreasing precipitation” (336)</p> <p>6.. “As a result of male out-migration in poor and low caste households of Bihar, women’s involvement in the agricultural workforce is even greater as women have become the de facto head of the households” 338</p> <p>4.1 “Women are especially concerned with complementing agro-biodiversity management with social ties and knowledge system management mainly through exchanges of knowledge and planting materials (crops and varieties in different fields). This is reflected by a major adoption of such strategies when women are making decisions within the family.” (346)</p> <p>“Uttarakhand, as a result of the phenomenon of economically driven male out-migration, middle-aged women with good access to land and diversified incomes (which together may be used as a proxy for measuring wealth) are not only more involved in agriculture and marketing, but are also playing a greater role in decision-making in their domestic spheres” (346)</p> <p>“Our findings show lower adoption rates of ecosystem-based strategies by such group of poor women, who are net labour sellers in the area” (347)</p>
<p>Huynh, P.T.A., and B.P. Resurreccion. (2014). Women’s differentiated vulnerability and adaptations to climate-related agricultural water scarcity in rural Central Vietnam. <i>Climate and Development</i> 6: 226–237.</p> <p>Retrieved May 27 2020</p>	<p>Ky Nam commune of Ky Anh district in Central Vietnam</p> <p>June 2010-October 2011.</p> <p>Household survey + FGD and interviews</p>	<p>Vulnerability of women when adapting and in vietnamese policies</p>	<p>(gender AND agriculture AND climate AND change) AND (LIT-MIT-TO (ACCE SSTYPE(OA)))</p>	<p>Gender differentiation: between females that work in a male-headed farm and females that work on the farm as the farm heads themselves. Policies tend to not include the latent.</p>	<p>3.1.b “The study highlights the heterogeneity of women as a group and their intersectional dynamics as they adapt to increasing agricultural water scarcity on their rural livelihoods. The findings show that social differences including gender, class, household headship, age and stage of life shape women’s differentiated experiences in vulnerability in access to water, to forestland and credit; in turn mark their adaptation differentiation to climate-related agricultural water scarcity.” (226) + “women in rural Vietnam – who occupy two-thirds of the rural labour force in agriculture and whose contribution is crucial for subsistence and food security – will be among the most vulnerable groups to climate-related changes due to their resource dependency and weak capacity to adapt”</p> <p>3.1.b “women are not a homogeneous group as they adapt to climate-related changes. As a result of this oversight, existing adaptation programmes and policies are running the risk of further marginalizing certain types of women.”</p> <p>4.2 “vulnerability of Vietnamese women to climate-related risks is exacerbated by uneven and unequal consequences of institutional and socio-economic changes since Vietnam shifted to a market economy in 1986” (226)</p> <p>2.2.a “Women were traditionally home-based in view of their reproductive obligations, crop production, animal production and small-scale logging for both home consumption and markets especially during lean and difficult times of agriculture. Men were generally more mobile as they travel to</p>

					<p>work on construction sites within or outside the commune and partly support women in land preparation, irrigation and harvesting” (229)</p> <p>1.2.b more drought: women experienced the impact most: “usual activities of crop cultivation and animal production were either impeded or stopped” + result: “home gardens > no vegetables” “fruit trees; animals took longer time to gain weight for sale.” (231)</p> <p>Page 231</p> <p>3.2.b “women having higher educational attainment are likely to be self-employed (P = .52). In contrast, women with lower educational levels were more likely to engage in waged labour activities (P = .08). The amount of credit access positively affects the likelihood of women to engage in self-employed activities (P = .00), whereas weak access to credit is more possible to lead women to engage in waged labour activities (P = .02).” (234) + “Household headship, age, education, credit access and class enabled or narrowed the attempts of particular women to diversify their livelihoods, and to secure them as well.”</p>
<p>U, M. & Niles, M. T. (2019). Smallholder farmers spend credit primarily on food: gender differences and food security implications in a changing climate. <i>Frontiers in Sustainable Food Systems</i>, 3, 56. Retrieved May 27 2020</p>	<p>data from the CGIAR Climate Change, Agriculture, and Food Security (CCAFS) program from Nyando (Western Kenya) and Wote (Eastern Kenya), Rakai (Uganda) and Kaffrine (Senegal)</p>	<p>Lack of financial resources to women agricultures</p> <p>Small holder farmers</p> <p>Access of small holder women to financial resources</p>	<p>(gender AND agriculture AND climate AND change) AND (LIMIT- TO (ACCE SSTYPE(O A)))</p>	<p>One way to build up more resilience towards climate change and to deal with unexpected losses or environmental impacts on for example the land is to integrate credit. These financial resources can help to give the farmers more stability when something goes wrong and a backup plan in that regard too.</p> <p>&</p> <p>4.1“Additionally, access to information and financial markets enables longer-term saving and borrowing and increases the ability of households to obtain insurance” (3)</p> <p>In addition, access to finance is part of the access branch.</p>	<p>smallholder farmers: who typically have less than five acres of land, yet provide more than half of the food produced in low-income countries”, combined they estimate to 2 billion total (2)</p> <p>6.”Evidence suggests that financial resources can help smallholder farmers by improving agricultural productivity to better handle risks associated with climate change, and allow smallholders to participate in non-farm activities” (2)</p> <p>4.1” Furthermore, formal institutions more often directly allocate money to property owners; however, many rural women lack property rights due to inheritance laws favoring men in the family line.” (2)</p> <p>1.1” As the climate changes, food security will continue to be a major concern, which comes on top of the already 815 million individuals classified as malnourished in 2016” (3) & “Integration of credit may allow households to protect themselves against vulnerabilities including shocks and loss/damage of crops” building up resilience for climate change</p> <p>4.1 Women have less access to financial resources: fewer resources and fewer resilience compared to men (page 3)</p> <p>“female empowerment, that enables women to work or access credit and allocate their earnings as they wish, or which enable women to be involved in household decision-making, may be an important strategy to improve household nutrition outcomes”</p> <p>results: “we find no statistically significant differences between any of our three household and sex type measurements and attempting to borrow money” + “find that female-headed households were statistically less likely to have had access to loans if they wanted to borrow” (5)</p> <p>conclusion: “As found by this analysis, gender, type of financial resource, and allocation of that resource are key components that show potential in affecting long-term food security and economic development for smallholder farmers.” (12)</p>
<p>Ylipaa, J., Gabrielsson, S., & Jerneck, A. (2019). Climate change adaptation and gender inequality: insights from rural Vietnam. <i>Sustainability</i>, 11(10), 2805. Retrieved May 27 2020</p>	<p>Qualitative research; interviews + FGDs, vietnam, fem. Political ecology lense, province of Thái Bình from Feb-April 2018</p>	<p>Climate impacts on small holder farmers</p>	<p>(gender AND agriculture AND climate AND change) AND (LIMIT- TO (ACCE SSTYPE(O A)))</p>	<p>2.1.b But the responsibilities are not only divided by gender, also by age, where older people do housework. + their interviews and FGDs revealed that the weaker people within the household do most of the more “feminine” tasks (pge 6)</p> <p>+ 4.1 Males are able to move more freely, outside the farm, have a drink with friends, while females stay behind and do not mention any of these activities in the interviews: so less or no leisure time</p> <p>+ 4.1.a“The differences in experienced and perceived risks</p>	<p>6.farming livelihoods in Vietnam are increasingly becoming feminised, as a result of urbanisation and devaluation of farming.</p> <p>1.1“Vietnam is projected to be one of the countries most affected by climate change” bc of floods, storms</p> <p>Vietnam: “considering that 70% of Vietnam’s population live in the countryside, and around 60% of this rural population rely on agriculture for their livelihood”</p> <p>1.1/3.1” women are affected differently and may perceive climate change in alternate ways to men”</p> <p>Feminist political ecologist give prominence to environmental justice and seek to locate and explain the origins and causes of oppression and injustices (3)</p> <p>“strengthened land rights for women increases their autonomy and status, because their control over assets may help change the norms and attitudes about economy being a ‘masculine task’ and, by extension, men’s social behaviour towards women” but “ince the reforms, women’s work has become less visible (mainly due to their unpaid housework)” (6)</p>

				between men and women is a product of the unequal production of and access to knowledge” (8)	2.1” tasks divided by gender are motivated by the perception of ‘natural abilities’; women are considered better suited for certain tasks while men are seen as naturally skilled in others. For example, women are assumed to be skilled in housework and petty trading, while men are seen as better skilled in strategic planning. In terms of farming, this means female farmers are mainly responsible for agriculture and animal husbandry, while male farmers are responsible for aquaculture.” (6) 2.1” Gendered division of labour and responsibilities extends to family finances, where women are ‘accountants’ in everyday transactions, while men are ‘managers’ of strategic purchases, investments, and business expansion.” (7) Men’s control of household purchases restricts women’s self-determination 6.In the context of CVC “we can interpret the triple burden on women as a situation where a gendered society places a burden of high responsibility on women without any corresponding level of decision-making power, providing fewer alternatives and possibilities to adapt to climate change.” 6. urbanization, labor-outmigration, men leave. feminisation of agrarian communities is growing in Vietnam and results in enhanced inequalities [7], especially for older women, whose responsibilities are growing, while they lack the rights associated with farm management.
Wrigley-Asante, C., Owusu, K., Egyir, I. S., & Owiyo, T. M. (2019). Gender dimensions of climate change adaptation practices: the experiences of smallholder crop farmers in the transition zone of Ghana. <i>African Geographical Review</i> , 38(2), 126-139. Retrieved May 2020	Central Ghana: Lawra and Nandom districts Survey of 612 farmers 328 female and 284 male farmers + 10 FGDs	1. Gendered perceptions of climate change and agriculture Relevant topics: The article focusses on the gender dimensions in climate change adaptation in Ghana	Google Scholar <i>gender dimensions climate change</i>	“gender dimensions to climate change vulnerability in the sense that there are differences in the adaptive capacity to the effects of climate change and these differences determine how well men and women respond to climate change. These differences are due to social norms, traditional roles and different power structures and therefore more women than men are likely to lose their livelihoods to climate change and extreme weather events due to their lack of resources” (3) “Vulnerability in the context of climate change refers to ‘the degree, to which a system is susceptible to, or unable to cope with adverse impacts’ of climate change, including climate variability and extremes” (2)	1.1 “farmers are vulnerable to shocks resulting from extreme events such as flooding, seasonal variation particularly the timing and amount of rainfall and long-term trends such as increased mean temperature” (2) 4.1 Ghanaian context: “women and men’s differential access to resources is one of the key dimensions of gender inequality” (3) “Although women depend on natural resources for their livelihood, they have very limited control over resources such as forest products and land” 4.1 “women are sometimes not part of the household and community decision-making processes that affect their lives, they are often excluded and underrepresented in decision-making and policy processes regarding climate change” + cultural biases (4) 6.”women are active agents who have developed locally adapted, appropriate and sustainable coping strategies and responses to climatic shocks” 4.1 “This confirms other studies that show that many women small-holder farmers have limited access to credit” (8) 4.1 adaptation: “Whilst men are more into on-farm agronomic practices, women are interested and utilize more off-farm adaptation strategies especially petty trading, in addition to the on-farm agronomic practices” (12) women’s ability to support the home financially improves their decision-making role (11)
New					
Gumucio, T., & Rueda, M. T. (2015). Influencing gender-inclusive climate change policies in Latin America. <i>Journal of Gender, Agriculture and Food Security (Agri-Gender)</i> , 1(302-2016-4765), 42-61. Retrieved May 30 2020	105 national-level policy documents related to climate change, agriculture, and food security in Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Peru.	Gender in policies	(gender AND agriculture AND climate AND change) AND (LIMIT-TO (ACCESTYPE(OA)))	Still the binary concept of gender as in women and men.	5.Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) was adopted by UN in 1979, “and an additional protocol on implementation was adopted in 1999” + “parties must take into account specific problems faced by rural women and develop measures to ensure that rural women are not prevented from participating in and benefiting from rural development. To this end, parties must ensure women’s meaningful participation in decision-making and guarantee their access to trainings, extension services, agricultural credit, loans, and technology” (44) 5. “The Beijing Platform for Action of 1995 developed detailed action plans for promoting gender equality and for ending discrimination against women. In its strategic objectives, it specifically addresses gender and the environment” +. “The Millennium Declaration calls for equal rights for all, independent of race, sex, language, or religion. Furthermore, it identifies specific values as fundamental to international relations in the 21 st century, such as: equal rights between men and women; gender equity as an effective means of combatting poverty and promoting sustainable

					development; and the ability for all to benefit from new technologies” (44) 5. :” Policy implementation and associated budgeting should also be based on gender equality goals. Gender indicators should exist for budgeting purposes. Gender equality goals should furthermore be critically considered in monitoring and evaluation” (46) Page 47: Table 1: Rubric for degree of gender integration
Assan E., Suvedi M., Olabisi L.S., Allen A. Coping with and adapting to climate change: a gender perspective from smallholder farming in Ghana. <i>Environ. Chang.</i> (2018);5(86):1–19. Retrieved May 2020	Ghana: communities—Mettoh, Kasalgr, and Tabier—in the Lawra district Through Interviews, FGD and surveys	Adaptation strategies in Ghana Focusing on both male and females and the differences between the amount of adapting and the reasons for it	Google Scholar <i>gender dimensions climate change</i>	“Similarly, males have been found to adopt improved seed varieties, soil fertility conservation practices and soil and water conservation practices than females (Assan et al., 2018). Assan et al. (2018) also observed that many male farmers compared to their female counterparts adopted strategies that would help them respond appropriately to climate shocks. These empirical evidences show that climate adaptation is either low for females than males or the strategies adopted by males is different from that adopted by females.” (in Adzawla)	4.1.a. “We find that female heads of farm households relied mainly on borrowed money from village savings and loans group as a coping measure; male heads of farm households depended primarily on sales of livestock.” 1.1”Many smallholder farmers in sub-Saharan Africa adjust their farm management practices to variations in the local climate and other factors such as unavailable markets, high input costs, and lack of infrastructure, to secure their livelihoods [20]. The projected impacts of climate change on agriculture require that farmers undertake coping and adaptation strategies to minimize their vulnerability to the impacts” (3) 2.1.a “it is men who have access to labor because traditionally men are considered farmers. The role of the woman is to help with sowing and weeding.” (9) 3.1.a “the findings show an interaction between gender and culture and social class in influencing access to and control over critical resources crucial for climate change adaptation among farm households, particularly those headed by females. Notably, the relatively low participation of females in climate change adaptation is rooted in gender relations, sociocultural norms, and power relations. Despite these existing inequalities, vulnerable male and female farmers demonstrate their resourcefulness in reducing their vulnerability to adverse climate change impacts.” (13)
Mersha A.A., Van Laerhoven F. A gender approach to understanding the differentiated impact of barriers to adaptation : responses to climate change in rural. <i>Reg. Environ. Chang.</i> 2016;16(6):1701–1713. Retrieved May 2020	Africa: rural Ethiopia With semi-structured interviews, FGDs	Adaptation strategies and the accessibility for male-and female headed households	Google Scholar <i>gender dimensions climate change</i>	Like other aspects of climate change, adaptation is not gender neutral. Mersha and Laerhoven (2016) explained that observed difference in gendered climate adaptation are as a result of gender barriers and not a preferred decision by men and women. (in Adzawla)	4.1.a “access to markets, extension and credit services, technology and farm assets (labour, land and capital) are critical in helping African farmers adapt to climate change.(Hassan and Nhemachena (2008))” (1702) + “adds family size, livestock ownership, income from farm and non-farm activities (Tazeze et al. (2012))” 4.1.a “The fifth assessment report of the IPCC listed eight distinct types of barriers: physical; biological; economic; financial; human resource; social and cultural; and governance and institutional barriers, and barriers related to knowledge, awareness and technology, respectively” (4.1.a “In negotiations, women have no voice, nor bargaining power to agree upon farm utilisation and harvest sharing.” (1709) 4.1.a “Training for women focuses on their reproductive and community roles (child nutrition, sanitation and hygiene, family planning and compost and biogas), not on developing their farming skill, which reinforces local gendered norms and the division of labour.” (1709)s 2.1.a”men’s domain and reproductive activities and the domestic sphere as women’s territory. In the local language, the word ‘farmer’ is, by default, associated with ‘he’.” (1708) “There exists a taboo against women ploughing, regardless of their land ownership status. This gendered restriction on women ploughing is justified by referring to ‘honour’ and women’s physical ability.” 3.1.a. “With regard to financial assets, we observed that the farm income of most female-headed households significantly differs from male-headed households. Often, female-headed households can keep only half or one-third of their harvest because of a sharecropping arrangement” (1711)
Carr E.R., Thompson M.C. Gender and climate change adaptation in agrarian settings: current thinking, new directions, and research frontiers. <i>Geogr.</i>	All secondary research about the topic	Climate change adaptation, non-binary view	Google Scholar <i>gender dimensions climate change</i>	“ the failure to include gender in projects or developmental interventions would lead to outcomes that are not optimal. The evidence of gender differences in climate vulnerability is a primary reason for the differences in climate adaptation by men and women. Women are often constrained in	5. “narrow binary gender analyses, where “man” and “woman” are treated as unitary categories with contrasting needs (183) + “it is possible, and perhaps likely, that in a given agrarian community, the vulnerability of a wealthy woman’s livelihoods to climate variability may have more in common with that of a wealthy man than they do with the vulnerability of a poor woman’s livelihoods.” 5. gender analyses should include “Descriptive statistics on the status of males and females, ideally disaggregated by age, income, ethnicity, race, disability status, location, lesbian,

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<p>Compass. 2014; 8(3):182–197.</p> <p>Retrieved May 2020</p>				<p>decision making and access to resources that can improve their livelihoods (Carr and Thompson, 2014). These resources and other sociocultural differences for instance, have led to the cultivation of crops with different biophysical characteristics by men and women (Carr and Thompson, 2014).”(from adzawla: intro)</p>	<p>gay, bisexual and transgender (LGBT) or other socially relevant category as appropriate” (USAID 2013, 8). (187)</p>
<p>sundström A., Mccright A.M. Gender differences in environmental concern among Swedish citizens and politicians. Environ. Pol. 2014;23(6): 1082–1095.</p> <p>Retrieved May 2020</p>	<p>Sweden</p>	<p>Women politicians tend to be more aware and act more on the climate change scenario. And are more involved</p>	<p>Google Scholar</p> <p><i>gender dimensions climate change</i></p>	<p>Maybe not as relevant, but it does answer number 5</p>	<p>5.6. This is particularly due to the fact that women are important agents of change. + observed that women are more concerned with the environment than men. This implies that the quality of the environment is more a priority to women than men, an indication that women may adopt more mitigation strategies than adaptation strategies.</p> <p>5. “The greatest gender differences are generally seen in studies dealing with worry about specific environmental problems, especially local problems with clear health risks to family and community” (1083)</p>
<p>Kay, C. (2015). The agrarian question and the neoliberal rural transformation in Latin America. <i>European Review of Latin American and Caribbean Studies</i>, 73-83. https://www.jstor.org/stable/43673539</p> <p>Retrieved May 30 2020</p>	<p>Latin America secondary data</p>	<p>The transformation in LA since the neoliberal shift</p>	<p>(gender AND agriculture AND climate AND change) AND (LIMIT- TO (ACCESSION))</p>	<p>Not as useful but states something about women being hired on the farms earlier compared to males.</p>	<p>2.1.a “While in the past most of the peasants' income in Latin America was obtained through farming, today it is estimated that it makes up less than half. Increasingly the peasant farm household is sustained by non- farm activities, especially those derived from off-farm work as wage labourers.” (76)</p> <p>3.1.b “Labour contractors do not often issue labour contracts or respect minimum wage legislation. They get away with these abuses particularly in areas where there is an abundant labour supply, leaving workers vulnerable to exploitative labour conditions. Often employers prefer women as they are perceived to have 'nimble fingers', be less conflictual and, above all, more willing to accept lower wages.” (77)</p>
<p>Sultana, F. (2014). Gendering climate change: Geographical insights. <i>The Professional Geographer</i>, 66(3), 372-381.</p> <p>Retrieved May 2020</p>	<p>South Asia</p>	<p>A feminist perspective of climate change in the southern sphere of Asia. Adaptation/vulnerability</p>	<p>Google Scholar</p> <p><i>gender dimensions climate change</i></p>	<p>Gender can influence the vulnerability and adaptive capacity to climate change because “men and women experience, understand and adapt to climate change in different ways” and “have differentiated vulnerabilities and therefore respond to and cope with vulnerabilities in different ways across social categories” (Sultana 2014: 373–77).</p> <p>From Echeverria</p>	<p>6.” Gendered implications of climate change in South Asia are particularly poignant as patriarchal norms, inequities, and inequalities often place women and men in differentiated positions in their abilities to respond to and cope with dramatic changes in socioecological relations but also foreground the complex ways in which social power relations operate in communal responses to adaptation strategies.” (372)</p> <p>6. “Even though climate change is often portrayed as affecting the poor uniformly in the Global South, this is further complicated by gendered power relations that are intersected with other social differentiations (e.g., class, race, ethnicity, etc.)” (373)</p> <p>1.1” exacerbate both ecological degradation (e.g., water shortages) and water-related natural hazards (e.g., floods, cyclones), thereby transforming gender–water geographies, it becomes imperative to undertake careful multiscale and critical analyses to better inform policymaking.” (372)</p> <p>5. “some programs might address practical gender needs, they largely fail to address strategic gender needs and systemic gender inequalities, power structures, and exclusions. A masculine bias remains in access to information, employment opportunities, decision-making processes, and institution building.” (378)</p> <p>4.1 “Climate change adaptation might reinforce gender inequalities and marginalizations. Gendered differences in knowledges and experiences with natural resources can influence the priorities people place on adaptation strategies” (378)</p>

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					4.1 “But women (compared to men) generally lack access to credit, markets, technology, and skills to sustain such changes that might not readily be available to them, or they are constrained by a host of social, political, and cultural factors.” (378)
Kaijser, A., & Kronsell, A. (2014). Climate change through the lens of intersectionality. <i>Environmental politics</i> , 23(3), 417-433. Retrieved May 2020	Documents from all over the world	Aim is to explore and show how an intersectional approach can help become more inclusive when it comes to climate change	Google Scholar <i>gender dimensions climate change</i>	“We suggest that intersectional analyses should address the question of which social categories are represented in, but also which are absent from, the case(s) under study. However, social categorisations should not be regarded as fixed; they always need to be understood in their specific historical and spatial context and as embedded in power patterns.” (422) + “Feminist theorists have pointed to the need for creating alliances based not on fixed identities but on common interests and solidarity, and with recognition of different positions (Haraway 1991, Mohanty 2003, Lykke 2005).”	Definition of intersectionality (p. 418-19) (421) assert, “How individuals relate to climate change depends on their positions in context-specific power structures based on social categorizations.” 3.1.a “tendency for simplification. For instance, the gender aspect is often reduced to narrow man–woman binaries, in which women are depicted as vulnerable, marginalised victims (as in Denton 2002), or given the role of caretakers with some special, almost divine, connection to nature. There is a risk here of reinforcing categorisations, and not taking into account how differences are socially constructed and context-specific, and how they may shift in realities of climate change. Apart from fixing difference and turning it into categories, it also excludes those who do not fit in these static categories and denies social struggle, contestation, and the complexity and fluidity of identities (Alaimo 2009, pp. 30–33). (421)
Pearse, R. (2017). Gender and climate change. <i>Wiley Interdisciplinary Reviews: Climate Change</i> , 8(2), e451. Retrieved May 2020	Literature review from secondary data all over	Gender relations and climate change	Google scholar <i>Gender in agriculture</i>	Even with outmigration, more burdens, but sometimes this has a positive effect on the women’s livelihoods	5. “first significant publications about gender and climate change was a 2002 special issue of the journal <i>Gender and Development</i> ” – reflected on the relationship between gender, poverty and climate variability (3) 3.1.a “vulnerabilities, not as intrinsic or ‘natural’ characteristics of women, but rather as expressions of existing gender inequalities and power relations in societies across the world.” (3) 3.1.a Nepal: “For women with partners away for work, the results often mean a larger workload on farms, and difficulties accessing finance and equipment due to historical lack of social power and access to markets. (5) but “sometimes; however, women may experience increased economic autonomy and opportunities to set up small home- based enterprises in the absence of their partners.” – similar observations in northern mali: “greater workloads and market barriers access in climate change-affected areas, they were also able to exploit new environmental conditions by cultivating forest products that had hitherto been unavailable”
Boyd, E. (2002). The Noel Kempff project in Bolivia: gender, power, and decision-making in climate mitigation. <i>Gender & Development</i> , 10(2), 70-77. Retrieved May 2020	Bolivia	A climate mitigation project in bolivia	Google scholar <i>Gender in agriculture</i>		2.1.a “Women generally spent their time in the fields harvesting maize or rice, collecting fire- wood and medicinal plants, and growing fruit trees and vegetables in their home-steads.” (74) + “ot work in the sawmills, extract timber, or hunt, and rarely fished. All these are activities typically associated with men.” 4.1.b “Women are rarely present at forestry programme meetings and workshops (73) 4.1 “Access to information, and what people do with that information, is an important aspect of empowering marginalised sectors within communities.” (76) 5. “that male- dominated social organisation is reinforced by Western scientific and development approaches; and that project activities are predominantly targeted towards men, or towards women’s practical rather than strategic gender needs.” (76/77)
Nelson, V., & Stathers, T. (2009). Resilience, power, culture, and climate: a case study from semi-arid Tanzania, and new research directions. <i>Gender &</i>	Tanzania	Difference between the vulnerability of males and females in climate change adaptation	Google scholar <i>Gender in agriculture</i>		1.1 “increased vulnerability is predicted for millions of smallholder farmers in the South, due to the effects of climate change on agricultural production” (81) 4.1.a “Existing gender norms and power inequalities shape the ability of men and women to adapt to climate risks (Rossi and Lambrou 2008). These include: (i) participation in decision-making and politics; (ii) the division of labour, (iii) resource access and control, and (iv) knowledge and skills. (82) Achieving greater gender equality and women's voice in decision-making is critical in climate negotiations, and in national/sub-regional mitigation and adaptation planning.

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<p>Development, 17 (1), 81-94.</p> <p>Retrieved May 2020</p>					<p>2.1.a “cropping, other activities such as collecting firewood and water, which tend to be seen as ‘women’s work’, are likely to be adversely affected by a changing climate, especially where this is compounded by localised environmental degradation. Decreased access to fuelwood suggesting the probability of more work for women as they search further afield, leaving them less time to earn income, let alone rest or relax.” (87)</p>
<p>Okonya, J. S., Syndikus, K., & Kroschel, J. (2013). Farmers’ perception of and coping strategies to climate change: Evidence from six Agro-Ecological zones of Uganda. <i>Journal of Agricultural Science</i>, 5(8), 252.</p> <p>Retrieved May 2020</p>	<p>Uganda 192 sweetpotato farmer households distributed in six agro-ecological Interviews, surveys August and October 2011</p>	<p>How smallholder farmers perceive climate change and adjust</p>	<p>Google scholar <i>Gender in agriculture</i></p>		<p>1.1 “From a food security perspective, sub-Saharan Africa (SSA) is arguably the most vulnerable region to many adverse effects of climate change due to a very high reliance on rainfed agriculture for basic food security and economic growth, and entrenched poverty” (252) + “Extreme climatic events like floods, drought/prolonged dry seasons, and storms were reported to have increased in the last 10 years” (256)</p>
<p>Kristjanson, P., Bryan, E., Bernier, Q., Twyman, J., Meinzen-Dick, R., Kieran, C., ... & Doss, C. (2017). Addressing gender in agricultural research for development in the face of a changing climate: where are we and where should we be going?. <i>International Journal of Agricultural Sustainability</i>, 15(5), 482-500.</p> <p>Retrieved May 2020</p>	<p>CCAFS program + literature review from all over the developing world</p>	<p>Gender dimensions, intersectionality of them (age, race, ethnicity, class etc.)</p>	<p>Google scholar <i>Gender in agriculture</i></p>	<p>“CCAFS body of work is unique in its focus on the nexus of gender, agricultural development, and climate change.” + ‘changes in agricultural practices are occurring mainly within existing gender roles’ (Jost et al., 2016).</p>	<p>2.1.a besides working on the field also “food processing and preparation and livestock raising” (483) 2.1.a “Women say that increased labour requirements are a disincentive to changing agricultural practices.” After CVC (491) + “any of the ‘climate-smart’ agricultural practices and interventions, for example, actually have the potential to substantially increase women’s workloads (e.g. composting and vermiculture, Jost et al., 2016)” (495) 3.1.a “Women and men farmers are both vulnerable to negative impacts of climate change, but women are less likely to act to reduce vulnerability”(495) 4.1.a “the sex of the household head influences adaptation decisions and most find that female-headed household are less likely to adapt to climate change given that they face more barriers (such as fewer assets, lack of access to information, or less access to credit) (Bryan et al., 2013; Deressa et al., 2009; Nabikolo, Bashaasha, Mangheni, & Majaliwa, 2012).” (486) + “women tend to have less access to land (both in terms of quantity and quality) in sub-Saharan Africa and Asia, which may put them at a considerable disadvantage with respect to the options that are available for adaptation” 4.1.b access to info is critical. “Information needs differ for men and women; while neither are receiving sufficient access to agricultural and weather/climate-related information in many places, women are particularly neglected.” (495) 5 6. “Beuchelt and Badstue (2013) find that conservation agriculture, which is often touted as an important climate-smart practice, increases the amount of time women spend weeding, adding to their overall time burdens. This suggests that increasing women’s empowerment cannot be assumed to be an expected result of agricultural development without sustained attention and gender-sensitive implementation approaches.” (492)</p>
<p>Behrman, J. A., Bryan, E., & Goh, A. H. (2014). <i>Gender, climate change, and group-based approaches to adaptation</i>. Intl Food Policy Res Inst.</p>	<p>Literature review from 2 developing contexts</p>		<p>Google scholar <i>Gender in agriculture</i></p>	<p>Framework: FIGURE 1 An integrated framework on gender and climate change page 2 Explanation: “pathways through which climate change affects well-being at the individual, household, and community levels. It can be used to promote an understanding of the differential impacts of climate change on men and women and, similarly, an understanding of</p>	<p>2.1 “Climate variability increases the scarcity of basic household resources, such as water, fuel, and fodder, and in turn increases women’s workloads in terms of the time and the energy required to source, collect, and carry these resources to meet household needs.” (4) + “additional time devoted to this single activity is also likely to have negative impacts on the longer-term health and well-being of women and girls, and can erode their economic opportunities to participate in education, training, and income-earning activities” 3.1 “Evidence indicates that disparities exist between men’s and women’s access to and control over key assets. Rural women in developing countries generally have fewer assets</p>

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Retrieved May 2020				men's and women's differential responses. In the context of vulnerability to climate change and the process of adaptation, this framework emphasizes the value of information, livelihood resilience, institutions, and asset accumulation." (2)	and rights than do men; they are more vulnerable to losing their assets and rights due to separation, divorce, or widowhood; and they have less access to capital, extension services, inputs, and other resources related to agricultural production" (3) 4.1 "Adaptation can improve well-being outcomes, while at the same time reducing vulnerability to future climate changes by increasing the ability of actors to withstand change and cope with its adverse effects. Actors at multiple scales— from the individual to the community—have different perceptions, needs, and preferences, and make adaptation decisions based on their decision-making power and access to/control over resources (such as assets, time, lifestyle, values)." (3) 4.1 "adaptation is an inherently "political" process that produces "winners" and "losers." (5) + "women lack access to the assets necessary for participation, such as land, financial capital, information, or social capital. Women, especially from poor households, are also more likely to face time constraints that limit their ability to participate." (5)
Peterman, A., Behrman, J. A., & Qisuumbing, A. R. (2014). A review of empirical evidence on gender differences in nonland agricultural inputs, technology, and services in developing countries. In <i>Gender in agriculture</i> (pp. 145-186). Springer, Dordrecht.	review of published and unpublished literature between 1999 and 2009.		Google scholar <i>women in agriculture</i>	p. 2 " <i>gender</i> represents a social construction of what it means to be of the male or female sex, including cultural, ethnic, economic, religious, and ideological influences. Likewise, <i>gender equity</i> refers to fairness in the distribution of opportunities, responsibilities, and benefits given to men and women."	5. Since the 1990s policymakers and development practitioners have highlighted the critical importance of gender in the implementation, evaluation, and effectiveness of programs across a range of social and economic sectors. <i>Gender and Agriculture</i> , a recent sourcebook produced by the World Bank, FAO and IFAD (2009, p. 2), warns that the "failure to recognize the roles, differences and inequities [between men and women] poses a serious threat to the effectiveness of the agricultural development agenda". Similarly, the International Fund for Agricultural Development (IFAD) states that although female farmers are primary contributors to the world's food production and security, they are "frequently underestimated and overlooked in development strategies" (2)