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Agricultural transformation through Climate-smart agriculture

A study on power relations in the Climate-smart villages of Hoima District, Uganda

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DECLARATION

I, Ingvild Vetrhus, hereby declare that this thesis is a result of my original research work and findings. All sources of information other than my own have been acknowledged and referenced. This thesis has not been submitted to any other University than the Norwegian University of Life Science (NMBU) for award of any type of academic degree. Ingvild Vetrhus, January 2019

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Abstract

Adaptation in a technical form and meaning is no longer enough if world populations are to be able to live with, reduce and withstand the impacts of climate change (Pelling, 2011). Various approaches to adaptation, such as Climate-smart agriculture (CSA) initiatives, are increasingly promoted as a solution to climate change for farming communities. They intend to both strengthen resilience and reduce emissions from agricultural activities, as well as enable poor households to manage climatic variability and change (Khatri-Chhetria, et al. 2017). Some scholars view CSA as a tool for agricultural transformation that promote equitable approaches in the face of climate change. However, it remains unclear whether CSA initiatives address the root causes of vulnerability to climate change, such as the link between power, vulnerability, inequality, and inequity – the interrelated factors that make people vulnerable to climate change in the first place (Karlsson, et al. 2017). This study investigates how CSA can open up or close down spaces for agricultural transformation towards equitable approaches to climate change, and addresses CSA through three spheres of transformation. These include the personal (worldviews, values) the political (policy and governance) and the practical sphere (measurable or observable adaptation outcomes on the ground) (O'Brien og Sygna 2013). The concept of subjectivities is then used as an analytical tool, or as a lense, to explore how the values and worldviews that underlie the socio-political relations in the case of a Climate-smart agriculture (CSA) project in Hoima District, western Uganda, interacts across the spheres. This study explores the social reality of CSA stakeholders and the local population, including members and non-members of the project, project staff and authorities, to gain empirical insight to how their worldviews, values shape power relations in and around the CSA project. Lessons drawn from the examination of this case study aimsto add to our understanding of the ways in which transformation may be supported or undermined through climate interventions, and provide an example of how power relations can open up or close down spaces for agricultural transformation in a smallholder farming community. Findings suggest that the power relations in and around the CSA project in Hoima risk reinforcing an expert-hierarchy, where subjectivities deriving from worldviews and values cast small-scale farmers, especially women, in passive roles as receivers. Without contestation, these subjectivities risk closing down spaces for transformation.

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Table of Contents

1.0 Introduction	4
1.2 Problem statement.....	6
1.3 Research objective and methods	7
1.4 Research questions.....	7
1.5 Motivations	8
2.0 Background and the Ugandan context	8
2.1 Uganda, agriculture and climate change	9
2.2 Gender and agriculture.....	9
2.3 Policy and climate change in Uganda	10
2.4 Climate-smart agriculture (CSA) in Uganda	11
3.0 Theoretical and conceptual review	12
3.1 Adaptation	12
3.2 Transformation and agriculture	15
3.3 Power and equity concerns: Adaptation and CSA.....	16
3.4 Defining agricultural transformation.....	18
3.5 How to investigate CSA and power relations: The three spheres of transformation and subjectivities	18
3.6 Subjectivities as a tool to analyze worldviews and values in the personal sphere	21
5.0 Methods and research design.....	22
5.1 Qualitative research, ontology and epistemology	23
5.2 Research design.....	24
5.2.1 Hoima District case study demographics	24
5.2.2 Climate-smart villages (CSVs) in Hoima District	25
5.2.3 Data collection and sampling	25
5.2.4 Interviewees.....	27
5.3 Analysis	28
5.4 Ethics.....	29
5.4.1 Some general limitations and ethical considerations.....	30
6.0 Main findings and discussion.....	31
6.1 What do farmers, policy makers, project staff, and village leaders perceive as “good” development?	31
6.1.1 How do different interview groups describe climate change and its causes?	33
6.1.2 Women and climate change.....	35
6.2 What do respondents view as “good” or “bad” forms of agricultural practices, and what do they consider the best way to promote and implement them?	36

6.2.1 Commercial farming versus smallholder farming	37
6.3 Gender differences in agricultural activities	39
6.4 Who do respondents perceive as important development actors?.....	41
6.5 Women in policy.....	43
7.0 The implications of worldviews, values and subjectivities for the Hoima CSV learning site	45
7.1 The role of farmers in the CSA project	45
7.2 Gender, equality, and equity in the CSV	47
8.0 Conclusion.....	48
Bibliography	52
Appendix	57

1.0 Introduction

This Master’s thesis examines the values and worldviews that underlie the socio-political relations in the case of a Climate-smart agriculture (CSA) project in Hoima District, western Uganda. The study aims to provide an example of how CSA can open up or close down spaces for agricultural transformation in a smallholder farming community.

It has been argued that adaptation in a technical form and meaning is no longer enough if world populations and communities are to be able to live with, reduce and withstand the impacts of climate change (Pelling, 2011). At the same time, various approaches to adaptation, such as Climate-smart agriculture (CSA) initiatives, are increasingly promoted as a solution to climate change for farming communities. They intend to both strengthen resilience and reduce emissions from agricultural activities, as well as enable poor households to manage climatic variability and change. CSA initiatives can include a number of technologies like drought-tolerant crop varieties and irrigation management, as well as policy interventions and improved weather forecasts. Some of these initiatives focus specifically on socially and environmentally sustainable farming practices for small-scale farmers (Khatri-Chhetria, et al. 2017). In Uganda, where erratic weather patterns threaten food security and farmers’ livelihoods, the government has adopted CSA programming into its national agricultural policies. The country’s CSA objectives aim to transform agriculture towards sustainable food production through various practices and training. “Integrating gender” into CSA initiatives is mentioned as one of the aspects needed to achieve this. Women make up most of Uganda’s agricultural workforce, that is mainly comprised of smallholders depending on rain-fed agriculture (GoU, 2015). Thus smallholders, particularly

women, are viewed as the most vulnerable group to climate change impacts in Uganda (Asiimwe 2014).

Yet, the development of climate-smart approaches is not unproblematic. For example, it remains unclear whether they represent an approach that addresses the social and cultural aspects integral to agricultural transformation. In particular, they tend to not address the root causes of vulnerability to climate change, such as the link between power, vulnerability, inequality, and inequity – the interrelated factors that make people vulnerable to climate change in the first place (Karlsson, et al. 2017). According to Eriksen et al (2015), power can be seen as a relation between people that is continuously reproduced or challenged through everyday practice and decision-making. Power relations are not given, they argue, and emerge from the way that people see humans' place in nature, and how they make sense of the world and its possibilities (worldviews). They are also shaped through what people value as the best ways to address them (values) (Egmont and de Vries, 2011). Values and norms about social order, such as cultural codes deeming men as leaders and women as supportive, shape both how people position themselves in relation to each other, to the state, and to development. For instance, when climate change threatens food security and farmers' livelihoods, who are considered the most appropriate actors to shape a response? Whose knowledges are legitimized through daily decision-making? And whose authority is recognized through adaptation responses? Are male and women smallholder farmers viewed as actors of change, and accordingly supported to take control of their own destinies? Or are they seen as passive receivers of assistance? (Eriksen et al, 2015)

Insufficient transformative adaptation to support sustainable farming is therefore not just a lack of awareness, but arguably rooted in social factors that determine who gets support and what technologies are useful and feasible to individual farmers. As a result, well-intended agricultural interventions have often failed to spur adoption of new practices or social change among large proportions of farmers (Karlsson et al, 2017). Some scholars therefore argue that there is a need to understand how the personal sphere of transformation, namely how worldviews and values converge and conflict among and between actors at several levels (in this case among CSA actors such as policy makers, experts and farmers) and how these are addressed through governance. The personal sphere is a part of a wider conceptual framework called The Three Spheres of Transformation. In this study, I draw on this framework that addresses transformation across three spheres, including the political (policy and governance) and the practical sphere (measurable or observable adaptation outcomes on the ground), where transformation in one sphere can spur transformation in the others (O'Brien og Sygna 2013).

In this study, I have used the concept of *subjectivities* as an analytical tool, or as a *lense*, through which I examine the personal sphere's values and worldviews that underlie socio-political relations, and how power is performed through these relations. Eriksen et al (2015) state that subjectivities can be described as the roles that people cast each other in, or as

the labels that one group puts on another. By identifying subjectivities and how they relate to authority and knowledge through key informant interviews, I argue that I can better make sense of the power relationship behind CSA, and identify how CSA can open up, or close down, spaces for agricultural transformation and gender equity.

In order to empirically examine this relationship, I have chosen to conduct a case study; a CSA project in Hoima District, western Uganda, where the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is currently developing CSA initiatives in seven villages, called Climate-smart villages (CSVs). Originally, these initiatives were mainly aimed at technical adaptation methods, but they are increasingly adopting a social focus (Aggarwal, 2018). This study examines the values and worldviews in the personal sphere through the analytical tool of 'subjectivities' to examine how power relations, in the context of a CSA project in Hoima, Uganda, can open up or close down opportunities and spaces for agricultural transformation and gender equity.

1.2 Problem statement

While climate-smart agriculture (CSA) is being promoted as a solution to climate change for farmer communities, it has been argued that the approach mainly focuses on technical interventions, and often fails to address the social aspects of adaptation, in particular power relations (Karlsson et al, 2017). Some further argue that uneven power relations may constitute a root cause of vulnerability to climate change in the first place. Such power relations may produce poverty, marginalization, inequality, or inequity (Nightingale and Ojha, 2013). In order to understand how power relations can open up spaces and opportunities for CSA to address these social aspects, scholars argue that there is a need to empirically scrutinize how the actors and stakeholders involved, in this case smallholders, government officials, project staff and local leaders, shape power relations through their worldviews and values (O'Brien and Sygna, 2013). While it is through power relations that "business as usual" approaches are contested or reproduced through every-day interactions and decision-making between the groups, it is also through these contestations that inequitable social relations can be transformed (Eriksen et al, 2015). While O'Brien and Sygna's (2013) conceptual framework suggests that sustainability and responses to climate change need to be addressed across three spheres of transformation; the personal (worldviews and values), the political (policy and governance systems) and the practical (outcomes of adaptation 'on the ground'), I argue that the worldviews and values that underlie the power relations of a CSA project can be assessed through the analytical tool of *subjectivities* that can be applied to answer vital questions of whose knowledges are recognized in Hoima CSVs and which roles stakeholders apply to farmers, especially women, project staff and government officials. It has been argued that these linkages between understandings of power, such as gender relations, and transformations, and the interactions between the spheres have remained largely unexplored. By looking into the worldviews and values of the personal sphere through the lenses of subjectivities, I argue

that I will be able to provide a broader understanding of how power relations in CSA can open up or close down spaces for agricultural transformation.

1.3 Research objective and methods

The aim of this study is to identify the ways in which Climate-smart agriculture (CSA) can open up, or close down, spaces for transformation across the three spheres of transformation; the personal, the political, and the practical.

I address this objective through qualitative semi-structured interviews that were conducted with relevant actors involved in CSA interventions. These actors include smallholder farmers, local and central government officials, village leaders, and project staff. The analysis of the interviews sought to identify differing worldviews and values among the informants and in particular how these conflict and converge. I used the analytical tool 'subjectivities' to explore how values and worldviews (personal sphere) are connected with power relations (the political sphere). I explore how the assigning (and internalisation or contestation) of roles and labels such as *experts* or *passive agents* form part of how power is performed and society structured. In particular, I investigate the extent to which the CSA project activities assign roles that give space for contestation of existing subjectivities and inequitable relations, such as gender or expert-farmer knowledge hierarchies, hence contributing to agricultural transformation across the three spheres. A desk review of relevant local and national policies on agriculture and development planning was also conducted in order to identify how these documents reflect particular worldviews as well as views of smallholders, and how they are differentiated by gender.

1.4 Research questions

Main research question: How can a climate-smart agriculture project support or constrain agricultural transformation in the face of climate change?

RQ 1: What worldviews and values do different farmers, village leaders, local project workers, and government officials at district and national level represent?

Sub question: What do farmers, village leaders, project staff and government officials perceive as "good development"?

Sub-question: How do farmers, local leaders, government officials and project workers perceive environmental change and society-nature relations?

Sub-question: Whose knowledges do different local project workers, policymakers at district and national level, and local leaders value?

RQ 2: How do subjectivities shape socio-political relations in the Hoima District's CSA project?

Sub-question: Who are viewed as the most “important” and “capable” development actors by respondents, and how is this gendered?

Sub-question: Which roles are assigned to small-scale farmers in relation to environmental change (do they cause or solve them)?

Sub-question: To what extent are male and female small-scale farmers cast in active or vulnerable roles?

RQ 3: To what extent are worldviews, values and subjectivities reproduced or challenged in projects?

Sub-question: Are there spaces for alternative worldviews, values, subjectivities and knowledges?

Sub-question: Who are perceived as those who end up making decisions and who are viewed as ‘left out’?

RQ 4: How can socio-power relations open up or close down spaces for gender equity?

Sub-question: how do government officials, local leaders, project staff and farmers perceive gender roles in agriculture and development?

1.5 Motivations

The focus and subjects of the MSc program International Environmental Studies have addressed how power structures and institutions deal with climate change and how this influences global food security and social-ecological resilience. My studies have had an emphasis on small-scale farmers and their important role in global food security, especially women. I believe that this thesis addressing agricultural transformation can build on a learning experience that has focused on a number of aspects associated with this concept.

2.0 Background and the Ugandan context

In this chapter I present the challenges that climate change poses to Ugandan agriculture, and how the country has adopted CSA strategies in policy and in practice. I also present the demographics and background of the study site, Hoima District.

2.1 Uganda, agriculture and climate change

Uganda is a country where climate change is increasingly affecting food security and farming systems. In 2015, CSA practices were adopted into national policy (GoU, 2015). This makes the country an appropriate context in which to investigate agricultural transformations in the face of climate change.

In Uganda, agriculture is the most important source of income, where about 70 per cent of (Government of Uganda 2015)the population rely on farming. Agriculture is also crucial for the country's growth and development, and is one of Uganda's main export sectors. It stood for around 23 per cent of Uganda's GDP in 2014 (GoU, 2016). Over 90 per cent of the country's agricultural output is produced by smallholders. The majority live under the poverty line, and farm on an average of two hectares of land (GoU, 2015). Most farmers in the country are engaged in rain-fed farming for food and cash income, and small-scale farmers are increasingly struggling to cope with a changing climate, including prolonged droughts and changes in rainfall patterns (Bertow & Lanje, 2009; GoU, 200 (Government of Uganda 2007)7). Scholars estimate that climate change can cause serious damage to food security in Uganda. For instance, it is estimated that the production of staple crops like maize and beans can decrease by 10-20 per cent by 2050 across East African countries, unless climate change is not dealt with. In addition to climate change, farmers are also facing challenges like crop pests and diseases, low production and poor implementation of policies and guidelines on agriculture including new practices (Thornton et al, 2010). Furthermore, it is also argued that challenges to climate change adaptation in Uganda include widespread environmental degradation, often linked to poor land management, charcoal production, and timber production by local households, as well as private and public sectors (Banana et al, 2017). It is also important to note that Uganda is classified as a country with the United Nations status of Least Developed Country (UN, 2018), and struggle to cope with issues related to corruption and budget constraints. The agricultural sector in Uganda is thus under-funded, which severely affects farmers' public extension services a (Banana, et al. 2014)nd agricultural development. (GoU, 2016)

2.2 Gender and agriculture

On the African continent, women stand for 85 per cent of agricultural production and processing. In the East African region, where Uganda is located, women are the main cultivators. Consequently, women are often more affected by climate change than men (Asimwe 2014).

In Uganda, women contribute to about 70 per cent of the agricultural workforce. They are also the main producers of food at household level, and the primary caretakers of the family (GoU, 2016). Still, women have limited access to resources, education, and decision-making, and are often subject to discriminatory social and cultural norms (FAO, 2017). While women

are vital contributors to food security, their efforts tend to go unnoticed or unappreciated. For example, a wife may be expected to carry out most of the household's domestic activities, such as producing food, cooking, cleaning, taking care of the children, and fetch water. While these activities are vital for a community's development, they are rarely addressed in a country's statistics or economic analyses, according to Budlender and Moussie (2013). This despite the fact that women, on average, often work 12 hours longer than men per week¹ across Africa, Asia, and the Pacific (FAO et al, 2015). As a result, these activities tend to be less valued than "paid work" and are rarely recognized by the public or by authorities. For example, some governments frequently "fail to design social and economic policies that can reduce women's primary responsibility for unpaid care work" (Budlender and Moussie 2013). Meanwhile, climate change risk exacerbating women's heavy workload. Prolonged dry periods and lack of rain may force her to walk longer distances for water, or damage her crops (FAO et al, 2015). This gender gap also makes it difficult for a woman to move beyond the domestic realm of production. A study on global trends by Brody (2014) states that if a woman wants to move towards higher-value markets, she is often limited by lack of capital, information and market linkages. While the "typically overburdened woman" has limited time to get an education, or a job, she also often has restricted access to productive resources, such as land, and to agricultural training activities and loans (FAO et al, 2015). For instance, findings from research on integration of gender in agricultural and natural resources policy show that gender dimensions are still not fully addressed by policymakers. In Uganda, four percent of land is owned by women, while the rest is owned by men. Consequently, millions of women can only access land through a male relative or a husband (Asiimwe 2014). Women's lack of land ownership also means that men generally have better access to agricultural inputs and support. As a result, women's agricultural production per hectare is 12 per cent lower than men's (FAO et al, 2015). These factors, separately and combined, make it difficult for a woman in Uganda to adapt to climate change (FAO, 2017).

2.3 Policy and climate change in Uganda

Uganda has several policies in place that emphasize the threats that climate change pose to the agricultural sector. While a number of national policies lay out future risks and current climate change impacts, the Uganda National Climate Change Policy (2015) stipulates guidelines on how mitigation and adaptation activities can be mainstreamed across industries, including agriculture (Ampaire, 2017). However, implementation of policies related to sustainable development and CSA have been limited as a result of poor technical capacity and lack resources to carry out extension work (Ampaire, et al 2017). While a decentralization policy was adopted in 1997 to, among other things, strengthen decision-making capabilities at district and local levels (Ojambo, 2012; GoU,

¹ According to FAO et al (2015) rural women in developing countries across Africa, Asia, and the Pacific work 12 hours more than men per week. <http://www.fao.org/3/a-i5546e.pdf>

1997), it is mainly central government that formulate policies on adaptation (FAO, 2017). At lower government levels, district governments form policy and implement strategies and priorities for the coming years, in line with national policy (GoU, 2015).

In order to better deal with, and prepare for, the impacts of climate change, Uganda signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1993. This international treaty formed the foundation for the UN's National Adaptation Programmes of Actions (NAPA). The NAPA was established to assist nations with Least Developed Country status in developing national adaptation plans (Ampaire, 2017). Countries were urged to "identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change" (UNFCCC, 2018). Uganda's NAPA came into action in 2007, and is considered to be the country's first policy with full focus on climate change adaptation. In light of the NAPA, Uganda implemented the National Climate Change Policy in 2015 which aims to "ensure that all stakeholders address climate change impacts and their causes through appropriate measures, while promoting sustainable development and a green economy" (GoU 2015 in Ampaire, 2017). The NCCP, which focuses on mitigation and adaptation, provides guidelines on how its clauses can be applied in the formulation of other sector specific policies, like agriculture. It also identifies the roles of relevant government actors in climate change responses and "mechanisms for a coordinated climate change action in the country." Uganda's Vision 2040 has also been identified as a key policy addressing climate change. The policy "identifies risks associated with climate change and outlines clear strategies for dealing with it" (Ampaire et al, 2017). It also describes the importance of improving the coordination of climate response between national and local levels. One of the main agricultural goals of the country, as stipulated in policy documents, is to transform the dominant smallholder production into commercial industry (GoU, 2007). For this study, I will review some of the policies addressing agricultural priorities and planning. I have chosen to review more sector specific planning and policy on agriculture. The Agriculture Sector Strategic Plan 2015/16-2019/20 is the most recent document that deals with lessons learnt, existing challenges and strategies, as well as future planning in regards of the agricultural sector, at national level. Similarly, the Hoima District Development Plan 2015/16-2019/20 addresses issues, lessons learnt, and planning within agriculture among other sectors, as well as climate change.

2.4 Climate-smart agriculture (CSA) in Uganda

As a means to deal with climate related challenges to agriculture, Uganda has adopted CSA strategies into national policy. The CSA model, which was first defined as a concept by FAO in 2010, was created to help countries address mitigation and adaptation issues related to agriculture (CCAFS, 2018). CSA was thus created as a conceptual tool to facilitate agricultural transformation towards sustainable resource use, and boost food security (FAO, 2010). The concept addresses both policy interventions and program design to ensure that

implementation of CSA strategies can be successful at all levels (CCAFS, 2018). The aim of CSA is threefold and is founded on the following objectives aiming to:

- “1) sustainably increasing agricultural productivity, to support equitable increases in farm incomes, food security and development;
- 2) adapting and building resilience of agricultural and food security systems to climate change at multiple levels; and
- 3) reducing greenhouse gas emissions from agriculture (including crops, livestock and fisheries).” (CCAFS, 2018)

Several Ugandan policy documents have integrated CSA in their objectives, including the ASSP (GoU, 2015). The Ministry of Agriculture, Animal Industry and Fisheries is the government department responsible for the implementation of CSA practices, together with the Climate Change Department under the Ministry of Water and Environment (GoU, 2015). In 2015, Uganda created the *Climate Smart Agriculture Program 2015-2025* which aim to transform agriculture develop adaptation to climate change in farmer communities, increase productivity and market linkages to reduce poverty, and introduce and implement more and new technology into farming systems. The country’s CSA program also describe a need to facilitate for better inclusion of women, stating that “women and Youth in Uganda play a vital role in agriculture,” acknowledging that women are especially vulnerable to climate change (GoU, 2015).

3.0 Theoretical and conceptual review

In this chapter I present and discuss some of the main concepts and theories that are key to CSA, and the framework and analytical tool I have used to assess agricultural transformation. While CSA generally aims to provide adaptation to climate change for smallholder farmers, the concept has been further defined as a tool to “transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate” (FAO,2018). Other institutions that are applying CSA in their projects emphasis that it also promotes “equitable increases in farm incomes, food security and development” (CCAFS, 2018). I discuss some of these key CSA concepts including *adaptation* and *transformation*, define *agricultural transformation* and argue that agricultural transformation should take a transformative adaptation approach that emphasizes the need for transformation across the personal, political and practical spheres.

3.1 Adaptation

Can the world keep global warming under the 1.5 °C target²? asks O'Brien (2018). Currently, she argues, scientists, scholars and policymakers tend to view climate change issues, and the strategies to deal with the impacts, differently. She narrows these views down to two aspects; climate change as a *technical problem*, and climate change as an *adaptive challenge*. O'Brien (2018) further argues that the majority of scholars and decisionmakers view climate change as a "complex social problem", however, she points out that most responses currently focus too greatly on technical solutions. Technical responses to climate change may entail using innovation, technology, and economic strategies to reduce emission of greenhouse gasses from industries such as agriculture, finance, the energy sector and so on. While scientists holding this view also often look at some social aspects, such as shifts in "social arrangements," O'Brien (2018) argues that the numerous "carbon roadmaps and pathways" that have been developed in order to meet the Paris goals, tend to ignore greater vital social aspects like "casual relationships", or the way that "deliberate social transformations" come about (O'Brien, 2018). "Technical problems are those than can be successfully addressed by applying greater expertise, more innovation, and better management," she argues. In contrast, "adaptive challenges are referred to as 'adaptive' because they require a new way of viewing both problems and solutions. They usually have technical aspects, but they also recognize the importance of mindsets, especially the beliefs, values, and worldviews that influence how problems and solutions are perceived, approached and addressed" (O'Brien, 2018).

The concept of adaptation to climate change thus has multiple meanings. Some scholars argue that adaptation to climate change mainly require biophysical changes and financial interventions. This can include providing farmers in a poor agricultural community with improved seed varieties to boost yields, and agrobusiness training to equip them for market participation (de Nijs et al, 2014; Pretty et al, 2018). On the other hand, Pelling (2011) argues that adaptive responses to climate change should be viewed as "social and political" acts. Adaptation to climate change, he argues, should address systems of governance that (de Nijs, et al. 2014) are responsible for some of the root causes that make us vulnerable to climate change in the first place. For example, Karlsson et al (2017) argue that issues of uneven power relations may lead to, or maintain, the marginalization of some groups, an act that may also produce unjust policies leading to dispossession of land, or lead lack of access to support and resources required for adaptation. As a result, some people become more vulnerable to climate change than others (Karlsson et al, 2017; FAO, 2015). Other scholars also argue that adaptation is a "socio-political process" that affects how groups vulnerable to climate change adapt to the changing climate (Eriksen et al, 2015). Still, O'Brien (2018) argues that the current responses should, in addition to addressing technical issues, pay greater attention to the personal and political dimensions of vulnerability. These two factors are what shape the way we exercise power, and decide on what we deem appropriate

² The 1.5 °C target of global warming was presented in the newest report published the Intergovernmental Panel on Climate Change in 2018 (IPCC, 2018). <https://www.ipcc.ch/sr15/>

responses to climate change. The practical responses, including both technical and social solutions, are vital outcomes of this process.

One of the first steps towards climate change adaptation and mitigation, according to Ampaire et al (2015), is to provide guidance through policy initiatives. Their study argues that farmers' coping strategies thus need to be supported and reinforced through policy actions: "While farmers are able to manage risks in their everyday lives, including those related to climate, they also need to adapt in order to reduce the negative impacts of climate change. However, for adaptation activities and efforts to be well directed, they must be guided and supported by policies and strategies." Yet some scholars warn that too great a focus on the political aspect as a solution, can risk narrowing adaptation down to a mere policy intervention. For example, Fischer, (1998) argues that social problems are too often dealt with by technocratic policies shaped by people believing in the "superiority of scientific decision-making", which leads to the separation of facts and values. This focus on technocratic policymaking is often in place to deal with matters efficiently through administrative means, he argues. Ojha et al (2015) further builds on his argument with a case study from Nepal. In Nepal, where adaptation to climate change is dominantly addressed by a top-down approach with a global technological framing of climate change that has failed to include and address the views and experiences of the local communities. As a result, technocratic worldviews persist, and responses fail to address the fact that people in a locality are vulnerable in different ways, ignoring existing issues of equity. According to van Bers (2016), collective action and the inclusion of all relevant actors' experiences and understandings are crucial in sustainable development. Through collectivity and inclusivity, we can better understand how populations need to adapt in the future, rather than just dealing with the immediate symptoms of climate change. By working together across all levels, from political circles to farmers on the ground, we can also ensure more equitable responses to climate change. For example, top-down approaches, such as strong political control over decision-making processes, may undermine the roles of vital non-political actors, such as the farmers. Top-down strategies may also promote 'one-size-fits-all' responses to climate change, often neglecting indigenous knowledge that can help strengthen local resilience. They can also reproduce uneven power relations, vulnerability and marginalization (van Bers et al, 2016).

Meanwhile, scholars also argue that adaptation in some groups or localities are often exercised at the expense of others, leading to a "redistribution of vulnerability" (Atteridge and Remling, 2018). (Kaika, 2017) for instance, uses the concept of Smart-Cities as an example of maladaptation. Smart-Cities like Amsterdam often use technical instruments to measure air quality and other vulnerabilities related to climate change and pollution. These instruments may require components made from the metallic ore of coltan. The (van Bers C 2016) Democratic Republic of the Congo (DR Congo) is one of the main global (Kaika 2017) suppliers of coltan. Here, long-lasting violent conflicts over highly desired natural resources

have had, and still has, serious consequences for the safety, livelihoods, and environment of local communities. This, she argues, is a result of a global system of dependence. Atteridge and Remling (2018) argue that it is inevitable that the global “connectedness of trade” leads to adaptation causing a “redistribution of vulnerability” rather than reducing it. Pelling (2011) thus argues for adaptive transformation to address the decision-making behind adaptation for promotion of more equitable adaptation. Kates et al (2012) suggest to replace incremental adaptation with transformative adaptation that require cooperation across larger scales and time. Moreover, O’Brien (2018) suggests a more holistic approach to transformative adaptation, with focus on transformation across the practical, political and personal dimensions, to alter the way we address climate change and make decisions. I therefore argue that adaptation should be an inclusive approach to climate change impacts, where both technical and social challenges are addressed together with the social root causes of vulnerability to foster adaptation at greater scale, rather than in just one locality or region.

3.2 Transformation and agriculture

The concept of transformation is increasingly lifted into focus as policymakers and scientists try to deal with the complexity of climate change (van Bers et al, 2016). Unless we transform the often incremental way we view and deal with climate change impacts, O’Brien and Sygna (2013) stress that “business as usual”, such as technical solutions to climate change, can continue to dominate responses. In order to also address the social and political aspects of vulnerability, we must thus transform how we perceive climate change and its solutions, they argue. For example, business as usual responses to *adaptation* usually means changing one’s practice “in response” to an event, like the farmer who adopts new drought-tolerant technologies in response to drought. *Transformation*, on the other hand, is the process of changing “from something into something that is physically or qualitatively different,” O’Brien (2014) argues. However, transformation is a vague and complex concept and has been used and defined in many different ways (Feola, 2015).

Transformation involve both acknowledging that the social world and the ecological systems are, in fact, one system, and that our generation can reduce the future impacts of climate change, O’Brien and Sygna (2013) contend. Furthermore, they argue that the perception of transformation is manifold; different groups and communities have their own views of what transformation is and what it entails. O’Brien and Sygna (2013) presents some of the following examples of how different scholars across disciplines describe transformation:

Transformations to sustainability usually emphasize a need to make deep transformation to governance systems, like the political system “to influence long-term societal change”, or to operational systems, like the transportation system, in order to reduce emissions, O’Brien and Sygna (2013) argue.

Transformational adaptation, in contrast to incremental methods, is described by O'Brien and Sygna (2013) as an approach that aims to tackle climate change issues on a larger scale in both space and time, often targeting large vulnerabilities while focusing on long-term solutions and resilience. It involves rethinking current strategies and transform ineffective systems, they argue (O'Brien and Sygna, 2013). While they stress that it is often viewed as a technical approach, it also addresses the limits to adaptation posed by social structures like the judicial system, authorities and power (Kates et al, 2012). Pelling (2011) further argues that transformational adaptation means a "radical change" of unjust regimes. He argues that while *transitional adaptation* involves disadvantaged groups of a current regime claiming existing rights that they are deprived of (like women in Uganda claiming their land rights), *transformational adaptation* means getting rid of an existing regime to replace it with a new one, where new values and worldviews are introduced.

Transforming behaviors take human behavior into account, and address the psychological limits to climate change actions. For example, cognitive psychology suggests that people view and handle the reality of climate change differently, while social psychology explains how cultural values play a major role in how groups and societies collectively deal with climate change (O'Brien and Sygna, 2013). Moreover, O'Brien and Sygna (2013) mention how an individual's worldviews and values shape the way that they respond to climate change. However, they argue: "... a focus on "attitude, behavior and choice" has been criticized for ignoring the underlying systems of provision, and the extent to which options and possibilities are structured by institutions and governments" (O'Brien and Sygna, 2013).

O'Brien and Sygna (2013) conclude that transformation must be seen through a more "comprehensive approach" where responses should address personal worldviews and values, as well as governance and adaptation outcomes. Together with Meadows (1999) they argue that understanding the mindset can be a "leverage point" for transformation, where changing worldviews and values can transform adaptation outcomes in the practical sphere.

Drawing on factors from the above literatures on transformation, O'Brien and Sygna (2013) propose a conceptual framework; The three spheres of transformation: the personal (addressing worldviews, values, knowledge); the political (representing policy and decision-making); and the practical (where the worldviews, values and decision-making are translated in to action on the ground, where the outcomes of a project can be observed or measured). This framework is further presented in section 3.5.

3.3 Power and equity concerns: Adaptation and CSA

As discussed earlier, implicit to the idea of agricultural transformation is addressing the social causes of vulnerability to climate change (Vermeulen, 2015). It has been argued that lack of attention to the values and worldviews that underlie power relations can lead to the marginalization of some groups, and deprive them of vital tools for climate change adaptation. For example, studies on gender, policy and adaptation in Uganda argues that a result of gender dimensions not being fully addressed in the country's national policies, and cultural widespread attitudes of viewing "men as powerful problem solvers and women as a weak," it is difficult for women to take part in shaping policy and technology that affect their livelihoods (FAO, 2017). Acosta et al (2015) further argue that women are generally labelled as "vulnerable to climate change" in Ugandan national policy documents. They warn that such labelling "radically simplifies" gender and equity concerns in agriculture, which may lead to simpler solutions and little attention to why, for instance, men are often better equipped to adapt to climate change. While issues of equity and gender inclusion tend to be associated with CSA, some argue that the concept often fails to address the root causes of vulnerability (Karlsson et al, 2017).

Scholars thus argue that underlying "socio-economic and cultural factors" form some of the root causes of why women are bearing the brunt of climate change in, for example, Uganda (Acosta, 2015). Gender equity is therefore important in numerous ways; not only is it vital to include women in decision-making and ownership so that they can better adapt to climate change – promoting gender equity can also foster economic growth, better family health, education, and lead to less poverty. "Evidence demonstrates that gender integration makes development efforts more effective," argues Gutierrez-Monte, (2018). According to Vermeulen (2015), CSA activities will not be able to transform agriculture unless they address and increase the attention to gender relations. For one, she specifies, as many CSA projects should start looking beyond the number of women they distribute technologies to, and start to address the "asymmetries" that cause them to have less access to these technologies than men. This, she argues, is increasingly being addressed in policy, yet still "emerging CSA policies and plans lack the attention to gender that would enable the transformative change that supporters of CSA claim to seek."

While some argue that CSA is not properly addressing equity concerns, others contend that gender equity is promoted in CSA strategies. For example, according to Karlsson et al (2017), "supporters of productivist approaches" such as sustainable intensification (SI) tend to point out that CSA can lessen the use of agricultural inputs, like fertilizer and pesticides. They argue that such interventions tend to lessen women's heavy workloads, and thus promote equity. Their study argues against this view, and states that the often market oriented nature of CSA approaches is focusing too much on technology for increased productivity and economic gain, while it neglects cultural gender dimensions. CSA approaches should address cultural norms, and seek to solve the problems that make women or others more vulnerable to climate change than other social groups. On the contrary, Collins (2017) stresses that CSA

scholars are currently focusing too much on women as “nature’s conservators”, and emphasizes the fact that women must be included in the “nature of markets”. Without attention to markets and trade, she argues, women can be excluded from the “corporate-led and trade-driven CSA.” However, Karlsson et al (2017) argue that it is this strong focus on markets and trade that lead to gender inequities in the first place. They state: “Critics assert that this narrow, market-oriented discourse masks important power asymmetries between the ‘partners’ and does not pay enough attention to important social justice and rights, particularly for women and marginalised groups.” Moreover, Karlsson et al (2017) argue that smallholder “voices and priorities” are neglected and overshadowed by CSA’s strong focus on commercial agriculture.

3.4 Defining agricultural transformation

As addressed in section 3.4, CSA has been criticized for not addressing the power relations that form the root causes of vulnerability, in this case, questions of gender equity (Karlsson et al, 2017). While including women is often a focus of CSA interventions, many the idea of inclusion is not enough. “Climate-resilient interventions must go beyond targeting women to focus on the underlying causes of gender inequality within communities,” argues Twyman et al (2017), arguing that CSA is also focusing too much on technical approaches and policy interventions. CSA is, according to Karlsson et al (2017), often associated with agricultural transformation. I have thus defined this term based on the literature discussed in this chapter. For instance, Vermeulen (2015) claims that agricultural transformation cannot take place unless gender equity is addressed, and that uneven power relations are one of the causes of this. I thus argue that agricultural transformation should be based on Pelling’s (2011) idea of transformational adaptation, where radical changes in regimes of governance must take place to address current values and worldviews that reproduce inequities. Furthermore, it has been argued that agricultural transformation must also address both the complexity of technological and social aspects of climate change, in order to include both social aspects of adaptation, as well as the biophysical challenges (van Bers et al, 2016). Based on the above discussions on adaptation and transformation, I argue that agricultural transformation should take a transformative adaptation approach that emphasises the need for transformation across the personal, political and practical spheres.

3.5 How to investigate CSA and power relations: The three spheres of transformation and subjectivities

In this study, I view agricultural transformation as a concept that need to address the worldviews and values that underlie power relations. I therefore argue that an appropriate way to investigate power relations in the case of CSV in Hoima District is to first address worldviews and values through the three spheres of transformation framework; the personal, political and practical spheres. This study then applies the concept of *subjectivities*

as a lens through which the interaction across personal, political and practical spheres are investigated. The two concepts help add depth to our understanding of what agricultural transformations are, and how they take place. Below is a presentation of the three spheres of transformation framework.

O'Brien and Sygna's (2013) three spheres of transformation framework derive from the idea that adaptation responses challenging "business as usual" cannot be transformed unless transformation is addressed across three spheres; the personal, the political and the practical spheres (see figure 1). All the three spheres are connected and can influence the outcomes, results or structures of the others. For instance, the personal sphere representing the worldviews, values and knowledge of stakeholders and actors - ranging from policymakers, citizens and technocrats – can affect the decisions in the political sphere, and can together shape the outcomes of the practical sphere. These can be contested by for instance farmers who experience that interventions clash with their every-day practices, or by authorities, whose interests and values may conflict with actions in the practical sphere. "By viewing the spheres together, it is possible to see the breadth and depth of transformations, as well as the multiple entry points for sustainability outcomes," O'Brien and Sygna (2013) argues. Below is a broader explanation of the three spheres.

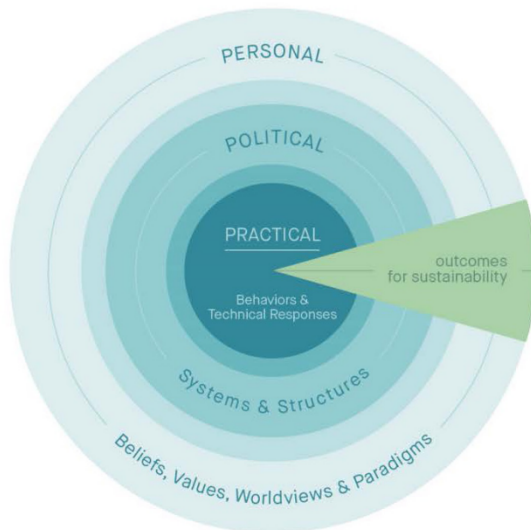
The personal sphere represents "individual and collective beliefs, values and worldviews that shape the ways that the systems and structures (i.e., the political sphere) are viewed, and influence what types of solutions (e.g., the practical sphere) are considered 'possible'". This sphere also represents how individuals or groups see the abilities or constraints of systems in the political spheres, or judge outcomes in the practical sphere. O'Brien and Sygna (2013) argue that the personal sphere is the most significant sphere: "Changes to beliefs, values, and worldviews can influence the types of actions and strategies considered possible in the practical sphere. Transformations in the personal sphere are considered to have more powerful consequences than in other spheres; paradigms can be considered the sources of systems, and beliefs and assumptions can influence the quality of connections with larger groups" (O'Brien and Sygna, 2013). Worldviews, in philosophical terms, can be described as a biased reality based on an individual's everyday life, and how this shapes his or her "perspective on reality as a whole." (Opsta og Hugé u.d.) Scholars Egmond and de Vries (2011) argue worldviews can be described as the way a person understands and sees the world and its potentials. They also underline that, in terms of sustainability, a person's worldviews are based on his or her experience of "the good life." For some people, this could mean economic security and prosperity in the immediate surroundings, for others, a healthy planet for all. In fact, Egmond and de Vries argue that worldviews can determine whether development adapts a "human" or "economic" approach. Worldviews can thus be described as how people make sense of the world and humans' place in, and their relationship with, nature. Meanwhile, according to Grunerta and Juhl (1995), values can be defined as an individual's "cognitive patterns". For instance, their study contends that values

control how humans assess and justify the actions of other people, themselves and events, and represent both the ego and collective interests, working as “crossroads between the individual and the society.” (C.Grunerta og Juhl 1995) Meanwhile, Egmond and de Vries (2011) “box” values into different categories such as religious, feminine, collective, and self-minded values. Values and norms about the social order (the natural order of things) arguably shape both how people position others and themselves. However, these are not given. In their paper *Environmental Values*, Dietz, Fitzgerald and Shwom (2005) discuss the role of values in sustainable development. They found that values often have different meanings within different disciplines linked to sustainability. In philosophical terms, values are decision-making tools, guiding us to make what we consider good decisions when we are in doubt. Political science and sociology describe environmental values as a cluster of factors, where the following is measured; “self-interest, altruism, traditionalism, and openness to change.” The researchers also put forward a second idea of what makes a society environmentalist and claims: A society where materialistic needs are satisfied is more likely to promote environmental values. (Dietz, Fitzgerald og Shwom 2005)

The *political sphere* constitutes the “social and ecological systems and structures that create the conditions for transformations in the practical sphere,” according to O’Brien and Sygna (2013). This entails, for instance, the formulation of policies or guidelines for a project or development actions. The content and focus included in a policy is often shaped by the worldviews and values of policy-makers, they argue. Whose or what authority can transform adaptation in the political sphere? O’Brien and Sygna (2013) argues that cultural, economic and governance institutions are significant factors – they can all close down spaces, or pave way, for transformation in this sphere. For instance, institutions with traditional mindsets or values, such as for example gender subjectivities based on cultural codes, may favour “business as usual” over modernisation. Furthermore, different institutions of governance will often disagree over the definition of innovation, and which actors they deem innovative. Still there are often actors that dominate these debates. “The dominant systems and structures have been established by societies through time and often reflect past and present beliefs, values and worldviews,” argue O’Brien and Sygna (2013).

The *practical sphere* is where the outcome of “behavioral and technical solutions to climate change” becomes visible; this is where the effects of for example a development project can be measured, where technology is introduced, and is where the impact of a project is felt or observed (O’Brien and Sygna, 2013).

Figure 1 is an illustration of the three spheres (from O’Brien and Sygna 2013):



O’Brien and Synga (2013) further contends that the relationship between power, worldviews and knowledge is complex and poorly understood, and argue that there is a need to assess this relationship. This can, O’Brien et al (2009) argue, “provide new insights on the limits to adaptation as a response to climate change.” I therefore argue that the concept of subjectivities can then be used as an analytical tool to examine the underlying values and worldviews that shape the power relations between CSA actors, and how these are contested or reproduced through how groups and respondents view each other’s roles and possibilities, and knowledge.

3.6 Subjectivities as a tool to analyze worldviews and values in the personal sphere

How can we properly explore how values and worldviews can open up for transformation in the personal sphere? Eriksen et al (2015) argue that we can use the concept of subjectivity as an analytical tool to explore how power relations, or socio-political relations, are structured and shaped through our values and worldviews. In the case of the CSV project in Hoima, I will address the subjectivities that derive from the worldviews and values of policymakers, in this case government officials at local and national level, project staff, local leaders, and farmers, and assess how they interact across spheres. This may illustrate how worldviews and value shape power relations.

According to Eriksen et al (2015) the term *subjectivities* derives from the concepts of values and worldviews, and can be explained as *labels* or *roles* that we cast each other in, based on how we see the world. Subjectivities can thus be explained by how we label other groups and view their role in development, more specifically how we view their capabilities and

knowledge in terms of dealing with climate change impacts. Based on how respondents see the world and its potentials, and whose knowledge they value, stakeholders and actors within a society may label small-scale farmers as, for instance, *victims without potential*, *assets*, or *drivers of change*. Subjectivities position people in relation to each other (social ordering), and is thus a relevant tool we can use to better understand agricultural transformation. For example, the label *innovative* signifies that a person is considered more capable than others, i.e. positions that person higher than most others in social hierarchies. Hence, actors labelled *innovative* may be considered as more capable or knowledgeable than groups or people that are viewed as vulnerable and are cast in passive roles, which may lead to their knowledge, or idea of climate change interventions, being chosen. However, subjectivities are constantly reproduced or challenged through everyday interactions. For instance, a group of farmers labelled as *backward* by policy makers may present themselves as innovative when describing local agricultural change and their own role. Through everyday interactions with authorities or project staff, they may be able to share their experiences and concerns about current practices, or challenge existing subjectivities, norms and knowledge, which may result in a more even distribution of power. When subjectivities are challenged, roles can also change: “... e.g. from ‘poor farmer’ to ‘climate resilient agricultural innovator.’” (Eriksen et al, 2015) For example, in the case of Uganda, gender and livelihood groups are examples of subjection. For example, “smallholder farmers” are often described in policy discourse as *passive* or as an obstacle to sustainable agriculture (Acosta et al, 2016). When such “hegemonic cultural codes” are nurtured through both the personal sphere (through worldviews, values) and the political sphere (here represented by policies) it is often more difficult for people to challenge the roles that they are cast in. “Authority and ‘authoritative institutional forms’ emerge out of the processes of subjection that are grounded in particular cultural frames,” Ojha and Nightingale (2013) argue.

In the case of CSA, I thus argue that subjectivities is a useful tool for understanding agricultural transformation in CSA. I have looked at project activities in the practical sphere, and how people involved in a project relate to each other allow for new subjectivities, and changed worldviews based on ideas of what respondents deem as “good” development and what role different actors (small farmers, men, women, 'experts / authorities') play in good development.

5.0 Methods and research design

In this chapter I explain and justify why I have chosen to use a qualitative research design. First, I explore some of the different philosophical lenses through which we see and understand social research. I briefly discuss some philosophical positions in research that are presented in Alan Bryman’s book *Social Research Methods* (2016), and how each of them is

applied in this study. I then present the research design and methods I have used to draw my conclusions, and some of the ethical considerations of this study.

5.1 Qualitative research, ontology and epistemology

In social research, a qualitative research strategy goes beyond raw data and general views, often focusing more on one specific case study or a few comparable cases (Bryman, 2016). Data collection through qualitative interviews also places the intentions and nuances of interests of an informant in focus. I thus argue that the investigative and detail oriented nature of qualitative research will allow me explore values and worldviews more in depth, compared to how I would through the generalist nature of a quantitative study (Bryman, 2016).

This study touches on elements from both *ontology* and *epistemology* philosophies of knowledge. The former is concerned with how the social world should be studied, and how we make sense of our findings. The latter explores the relationship between the social structures and how they shape reality, knowledge or truth (Bryman, 2016). Bryman mentions several ontological positions in his book on social research methods. For instance, supporters of *objectivism* base their research on the idea that the social world is constructed by external forces, and not explicitly by the people living in it. For example, the hierarchy of an organization, which is commonly used as an example in social research, is inherent to the rules set by the institution: “the organization represents a social order in that it exerts pressure on individuals to conform to the requirements of the organization. People learn and apply the rules and regulations. They follow the standardized procedures. They are told what to do and tell others what to do. They learn to apply the values in the mission statement. The organization is therefore a constraining force that acts on and inhibits its members,” Bryman states.

For this study, I am using the contrasting *constructivist* approach to research. Constructivism views knowledge, or truths, as socially constructed. For example, it is often argued that the “social order” of an organization is a result of negotiations, interactions and understandings taking place between the groups and people in the social world. Knowledge and social structures are thus constantly changing as new knowledge is continually introduced, contested, agreed on, and shaped through everyday decision-making negotiated through the groups of an organization. “*Constructionism also suggests that the categories that people employ in helping them to understand the world around them, are in fact social products,*” Bryman concludes. The constructionist approach under ontology argues that culture and organizations, which in my case is illustrated by the CSV initiative in Hoima District, are shaped by the views and behaviors of the actors in the project.

In *epistemology*, the positivist view on research argues that reality is, and knowledges are, objective and should be measured, often in quantitative terms. In contrast, the interpretivist stance entails examining the root causes of events, rather than measuring them, by exploring perceptions and interpreting our surroundings. (Bryman, 2016; Al-Saadi, 2014) Scholars with an interpretivist view on research often argue that truth is subjective, and is shaped by the individual or groups. The interpretivist stance encourages me to explore, and make sense of, the worldviews, values in the personal sphere, as well as the subjectivities deriving from them, and allows me to explore potential obstacles to, or openings for, agricultural transformation.

5.2 Research design

The research questions are addressed through a case study of a Climate-smart agriculture project in Uganda. This case study aims to illustrate how climate change responses affect interactions between the three spheres of transformation. Empirical research has been carried out through qualitative semi-structured interviews around a CSV project situated across 21 villages in Hoima District, and analyzed thematically. According to Yin (2018), a case study design enables the researcher to go in-depth and explore the social reality of stakeholders and the local population, including members and non-members of the project, project staff and authorities, to gain empirical insight to how their worldviews, values and knowledge can constrain or pave way for agricultural transformation. Lessons drawn from the examination of the CSV project in Hoima can add to our understanding of the ways in which transformation may be supported or undermined through climate interventions.

This is also a *comparable study*. By asking the same and similar questions to different groups of stakeholders, I can compare the worldviews, values and subjectivities of different stakeholders, to make sense of how power relations are constructed. Semi-structured interviews allow me to tailor questions to the specific groups in order to gain relevant background and context (Bryman 2016).

5.2.1 Hoima District case study demographics

Hoima District is located in Western Uganda on Lake Albert, bordering the Democratic Republic of the Congo. The district has a population of 573,000, where the majority of households are male-headed. The district consists of 4 counties, 15 sub-counties, and 457 villages, with the district administration based in Hoima Municipality. About 24 per cent of the district's rural population live under the poverty line, while over 30 per cent of people over 18 years old are illiterate. Access to energy is scarce in Hoima, where only 16 per cent of households have electricity, and many rely on charcoal burning for cooking. Household access to clean water is also lean; 27 per cent use a borehole to access water. Meanwhile, 70 per cent of the population of Hoima rely on subsistence agriculture for food. Small scale

agriculture also employs 63 per cent of the district's work force, and the average family has about 2.5 hectares of land for food production. Very few farmers in Hoima District have access to machinery like tractors, and use hand hoe and machetes in the fields (GoU, 2015). Farmers in the area also face challenging climatic conditions like unpredictable rainy seasons, prolonged dry spells, reduced soil fertility and land degradation, poor infrastructure such as roads and limited access to markets. (Recha et al. 2016). A study conducted by CCAFS in 2011 concluded that two thirds of households in Hoima were food insecure during periods of 2010 (Mubiru & Kristjanson, 2012).

5.2.2 Climate-smart villages (CSVs) in Hoima District

In 2012, The CGIAR Research Program on Climate Change, Agriculture and Food Security (CAAFS) established a CSA program in Hoima District, in cooperation with the Ugandan government research institute National Agricultural Research Organization (NARO). One of the aims of the project was to test climate-smart technologies through participatory action research, providing an opportunity for agricultural transformation and food security, and to increase the implementation of successful climate-smart technologies (Recha, 2016).

The project was first started up in seven villages (climate-smart villages – CSVs), where two farmers' associations were created to bring smallholders together in collective action to reduce the impacts of climate change. These organizations have grown in membership since they were established, and local farmers are encouraged join the associations for a member fee. Project action has included distribution of demonstration seeds for members to test, ranging from improved mango seeds and other staple crops such as beans and cassava. Other actions have included the establishment of improved weather forecasting activities coupled with indigenous knowledge, promotion of horticultural crops for variation, more crops varieties, and agroforestry for better conservation. The project has also increased farmers' access to affordable certified inputs through loaning and banking. The structure of the implementation of CSA is as follows: NARO project staff select farmers that are supported to set up on-farm demonstration sites for other local farmers to learn from. In addition, model farmers receive training on improved agronomic practices directly from the project. The model farmers then train the members of their organization on these practices. By 2016, 21 villages were incorporated into the Hoima CSVs model (Recha, 2016).

5.2.3 Data collection and sampling

I have used *purposive sampling* to select informants, such as policymakers, project workers and government officials, who are connected to, or work with, CSA in Uganda. I also used purposive sampling to select farmers who are members of CSV projects, and engage in CSA activities through the project. In addition, I interviewed non-member farmers who live in Hoima District. I have chosen both non-CSV and CSV-farmers to address the views of CSA-

target communities as a whole. CSV farmers were purposely included in the sample in order to investigate how they related to the project through CSA activities, and how this mutually influenced worldviews and subjectivities. I have interviewed people from different levels of CSA in Uganda, including national and local government officials, project workers, local leaders and farmers, in order to identify how power is constructed around the Hoima CSV project.

As I was not familiar with Hoima, I relied on *snowball sampling* (Bryman, 2016). I conducted all interviews with farmers together with a local field guide who volunteered for the project and knew the area well, and who could introduce me to both CSV-farmers and non-CSV-farmers. The field guide would also identify relevant local government actors. I sampled central government officials through a form of snowball sampling. I interviewed two that were present at a relevant project launch meeting, after which one of them also introduced me to a third government official who was relevant to interview.

I used *qualitative semi-structured one-on-one interviews* and a *focus group discussion* to collect most of my data. I first conducted a focus group interview (with the gender balance of two male and two female farmers) to gain an overview of the local context. Meanwhile, qualitative one-to-one interviews allowed me to explore an individual actor's worldview or value in depth. By conducting semi-structured interviews, I tried to ensure that every informant responded to the same issues, while I at the same time could tailor a flexible interview guide to a respondent's profession or background. This allowed me to compare results based on five interview groups, but still allow room for wider narratives and data (Bryman 2016)

The interview guide included questions that helped me identify respondents' worldviews; the lens through which they see the world and their relationship with nature (for example; "what is climate change to you?") values; an individual's principles that guide them in deciding what is good, bad, right or wrong (for example; "what is good development and who, in your opinion, are the most important development actors in your community?"), knowledge (from whom do you seek development guidance, and what is the most important source of knowledge?) and subjectivities: "what is the role of the small-scale farmer in a society? How do you perceive gender roles?")

I have also conducted a *desk review* of one national and one district policy document that include agricultural and development planning. I have chosen to conduct a desk review of relevant policiesto address the political sphere of the conceptual framework. I have analysed hoe the policy documents address climate change and its solutions, "good" development and how they represent smallholder farmers and women compared to individual interviews, the focus group discussion, and the notes with the CSO staff.

5.2.4 Interviewees

The individual interviews were represented almost equally by gender (to properly assess the gender aspects of the study). I conducted 19 individual interviews and I divided them into five interview groups: ten smallholder farmers (five men and five women, including non-CSV and CSV-farmers), two local government officials (one male and one female, both CSV-farmers), central government officials (two men and a woman), two village leaders (one man and one woman) and two CSV project workers (both male). My findings also include notes with local CSO staff that work with agricultural projects to provide wider context and background information. I also conducted one focus group interview where two female farmers and two male farmers, where one woman and one male were CSV-farmers. See table of interviewees below:

Group	Total number of informants in group	Number of male informants in group	Number of female informants in group	Number of CSV-farmers in group	Number of non-CSV farmers in group
Farmers	10	5	5	4	6
Local leaders (also farmers)	2	1	1	2	0
Project staff	2	1	1	0	0
Local government officials	2	1	1	0	0
National government officials	3	2	1	0	0
Civil society organization (CSO) staff	2	2	0	0	0

One limitation, however, is that the interview group of central governmental officials had an overrepresentation of male respondents. Both CSO workers are also male, which skew the results gender-wise. There is also an overrepresentation of non-CSV farmers in the farmer group, while both local leaders are CSV-farmers. This is mainly because of my reliance on snowball sampling.

5.3 Analysis

I have analyzed the interview data with a *thematic approach* using *coding* to highlight recurring themes, concepts and keywords. I have then categorised them, based on the definitions from chapter 4, into worldviews, values, subjectivities and knowledge, to the questions of the interview guide. Furthermore, I have also included some operational questions in the analysis process to provide more context. See part of an interview table used to analyze interviews with farmers below (for the full table, see Appendix):

Theme	Themes broken down to categories	Questions	Answers Farmer: Gender: Age: Member of CSV/association:
Worldview – how the person understands and sees the world and its potentials	Modernisation, traditional, economic, cultural, relationships between nature and economics, importance of innovation or traditions	<ul style="list-style-type: none"> • How important is the weather for your farming? • What do you think are the main causes of climate change? • What, in your opinion, is a well-developed society? 	
Value – what's important	Socially collective "greater good for the greatest number of people", egocentric, environmental, economic, egalitarian/collective, individualist, self-interest, altruism, traditionalism, openness to change, collective, self-minded values, gender equality/equality for all/egalitarian	<ul style="list-style-type: none"> • And what, in your opinion, are the best ways of achieving "good" development? • What do you think is the best solution to climate change? 	
Knowledge "where or who do they listen to in terms of knowledge"	Religious/spiritual leaders, scientific/expert, local/traditional knowledge or experience, peers/friends, cultural or religious leaders, socially structured knowledge,	<ul style="list-style-type: none"> • Are you familiar with Climate Smart Agriculture? • From whom do you get the most important knowledge about how to tackle climate change or other environmental • From whom do you get the most important knowledge about how to tackle development issues? • When debating or shaping policy on environment and food security, who do you consult? 	
Subjectivities – shaped from a person's values and worldviews	Stereotypes, labels on cultural groups and professions, perceptions of key actors to achieve adaptation, assets/drivers of change, perception of gender roles	<ul style="list-style-type: none"> • What/who are the most important <u>actors</u> contributing to "good development"? • How do you view women's role in agriculture? • How can women contribute to sustainable development? • How do you view men's role in agriculture? • Who/which actors can contribute to improved food security? • Who should receive technical and financial support in terms of food security? 	

Limitations: when using coding, Bryman (2016) argues that one can miss the context of a statement and thereby corrupt the data. To address this limitation, I have combined coding with narrative analysis, where I have linked concepts to context with quotes and some background information (see section below).

Desk analysis of policy documents and earlier studies: There are several national policies that address climate change and adaptation in Uganda. I have conducted a desk review of some policies relevant to CSA and agriculture to identify how smallholders, especially women, are addressed in policies at national and district levels, as well as national and district priorities in terms of agricultural development. I have reviewed two planning policies, one to address the national priorities, and one that accounts the priorities at district level: The National Sector Strategic Plan (ASSP) of 2016 and the Hoima District Development Plan 2015/2016. Both address agriculture as a sector, lessons learned and the desired direction of agriculture and transformation. I have also looked at Uganda's official CSA guidelines *Uganda climate smart agriculture program 2015-2025*, the national planning document *Uganda Vision 2040*, and some research studies and reports addressing gender issues in Ugandan policies related to agriculture by Acosta et al (2015) and Acosta et al (2016) and FAO (2017). Findings from the desk review is compared with key interview findings.

Limitations: As there are several policies that address agricultural development at national, district, and sub-district levels, and as I have not examined all these, I can only provide examples from a few policies. I thus risk leaving out documents that can potentially show perspectives other than those mentioned in the reviewed policies. I have therefore used the above published studies on gender in policy, to provide more context.

5.4 Ethics

The thesis proposal, interview guides and consent forms were reviewed and approved by a social sciences ethics committee at Uganda's Makerere University, and by the Norwegian Research Council. Upon my arrival to Hoima District, I introduced myself and my thesis proposal to district authorities.

Before I carried out interviews, I gained informed consent from my informants. This was done by myself, when English was spoken by the informant, or my translator, when English was not spoken by the informant. We carefully explained the purpose of the research and the contents of the consent form to every respondent. These include how the informant is free to withdraw from participating at any time, and that their identities are kept anonymous to provide an environment where they could speak freely. My translator was a woman, and I hoped that it would make it easier for female participants to share their experiences on gender roles and access to support.

5.4.1 Some general limitations and ethical considerations

Use of translator: Although most of the respondents understood and spoke English, it was sometimes necessary to use a translator. Before we started the interview process, my translator went over the interview guide to simplify some of the questions to make it easier to conduct the interviews. However, we still at times found that it was difficult for some interviewees to understand some of the questions. This may have affected the results. My translator often took time to explain some questions to ensure that the farmers understood them properly, often by rephrasing a question. This also means that some participants got slightly different questions.

My own position in the field: First of all, I am a Norwegian national and resident with limited knowledge about the culture in Uganda, which I tried to always keep in mind while I was collecting data and writing this study. Also being a student with time constraints and few resources limited my ability to spend a lot of time in the field, to get a proper insight into local culture, norms, and the effects of the CSA project among farmers. This may have affected the trustworthiness of the study (Bryman, 2016). I also tried to be clear about my role when I conducted interviews. When I informed people that I was examining some of the elements of a local agricultural project, some respondents asked if I was directly connected to organizations or donors, and if I was able to improve or provide more support in terms of training and inputs. My interpreter and I explained that I was a student with no decision-power in projects, and that I had no direct link to local organizations. Although most respondents seemed to understand my background after we explained the situation, it still may have affected some of the responses of the interviews.

My own interpretation of the social world: Although *reliability* and *validity* are mainly quality-measuring concepts applied to quantitative research, Bryman (2016) argues that if these terms are slightly modified, they also can, to a certain degree, be used to ensure trustworthiness in qualitative studies. For example, the *confirmability* of a study deals with the fact that the social world is not objective, but that, as a researcher, you acknowledge this fact, while trying your best to make sure that your own personal values do not influence the data. As mentioned above, this study is conducted through qualitative interviews and analyzed through the lens of interpretivism, and it is therefore important to note that the findings are based on my own personal interpretation of interviews. I have tried to stay objective throughout the research and writing period, but the qualitative nature of this study can bear hints of my own values and perspectives (Al-Saadi, 2014). I also argue that I can, to a degree, apply the concept of *internal reliability* to this study. This entails that observations were made by more than one person, and that they agree on “what they see and hear.” I conducted the farmer interviews and the focus group discussion together with my interpreter. After interviews, we discussed our understandings of the situation and the answers provided by my informants. Whenever I expressed confusion, she would provide me with cultural context and her own account (Bryman, 2016). I also argue that the concept of

triangulation can be applied to ensure trustworthiness to this study. *Triangulation* is described by Bryman as using previous studies on similar topics and cases, that can be used to compare with to verify empirical ideas or theories occurring in the data. To address this, I have reviewed other studies addressing gender issues in policy, which are somewhat consistent with some of the interview findings (see Main findings and discussion.)

6.0 Main findings and discussion

In this chapter, I present, compare, and discuss the main findings and trends that emerged in the analysis of the following: interviews with a farmer focus group comprised of two men and two women, including both CSV and non-CSV farmers; individual interviews with male and female CSV and non-CSV farmers, male and female local government officials, male and female village leaders, male and female project staff, and male and female central government officials; and findings and trends that emerged in two policy documents, The Hoima District Development Plan 2015/16-2019/20 (HDDP) and the Agriculture Sector Strategic Plan 2015/16-2019/20 (ASSP). In sections 6.1-6.7, I analyze these data to address the main research question “*How can a climate-smart agriculture project support or constrain agricultural transformation in the face of climate change?*”. In section 7, I have addressed how the findings inform our theoretical understanding of adaptation, for instance how the roles of ‘passive receivers’ and ‘experts’ are illustrated in projects, and how these subjectivities risk closing down spaces for agricultural transformation.

6.1 What do farmers, policy makers, project staff, and village leaders perceive as “good” development?

In this section, I examine the interview data to identify what different actors (farmers, policy makers, project staff and village leaders) perceive as ‘good’ development, and how they perceive the causes and impacts of climate change. The analysis found that although there are some valued aspects of development that were common to most respondents, there were also differences between groups and gender, which implies differing worldviews. These different worldviews may illustrate how different ways of seeing the world and its potentials can shape the way that different groups view adaptation and power relations.

First, respondents were asked directly what they considered as “good” development. Informants agreed on many aspects; the majority of respondents from every interview group mentioned access to food, social services like healthcare and education, and the importance of access to markets, storage facilities for agricultural produce, income and economic prosperity, and infrastructure like roads. For example, one female non-CSV farmer, who was alone on her farm, expressed how she found it difficult to transport her agricultural produce to the market. The market was far from her farm, and the only way to

get there was through a dirt road that turned into deep mud in the rainy seasons. Project workers, village leaders and local government officials also stressed the importance of roads, while also emphasizing the importance of farmers' access to storage facilities. "[Farmers] lack storage facilities to store their food after harvest. This is a problem, especially for sweet potatoes. If the season is off, there will be no sweet potatoes in the markets," one project worker said. Some fruits and vegetables are also destroyed because of poor access to storage facilities, one local government official and both project staff members explained.

However, there were also differences between some of the interview groups in terms of what was deemed 'good' development. While farmers and project workers both stressed how income generation was necessary for a household in order to achieve food security or meeting other basic needs, most farmers agreed that the government should pair with wealthy private actors and provide farmers with loan-based funding to improve agricultural development. "We need technology like tractors and access to fertilizer, which is expensive," said one farmer. This view, however, was contested by a project worker who argued that loans had, in some circumstances, been ineffective in the past, often working against its purpose. Investing in extension services and agricultural research would improve agricultural development, the project worker argued. While most informants emphasized social and infrastructural development, the sources of investment and funding were contested. Farmers in particular emphasized the responsibility of the government in providing funding.

On the other hand, government actors emphasized local development and self-sufficiency, as well as the importance of investing in other sectors to fuel development in the agricultural sector. National government officials also stressed how it was important for central government to access international, domestic, or private sector funding, earmarked to facilitate development initiatives and adaptation responses. Development needs, a male central government official expressed, were mainly located in the agricultural sector because Uganda "is an agro-based economy" that relies on the "sustainable management of the natural resources." He continued: "A well-developed society is a society that can meet its needs without denying future generations' ability to meet their needs." In order to achieve this, all three central government actors stressed the need for project funding and described how climate mainstreaming throughout all sectors would improve sustainable development and agricultural production. It is important to look at agricultural development holistically, stated the male official; investing money in tourism and oil exploration will improve infrastructure and household access to electricity, and give farmers access to larger markets and storage facilities. "Because where else will we get the funding?" he asked. International loans have high interest and a population of small-scale farmers practicing rain-fed agriculture cannot afford to pay taxes to fund development, he underlined. The tourism sector must thrive so that environmental preservation is prioritized,

he stressed, adding that all sectors play an important role in sustainable and agricultural development.

The female national government official, on the other hand, described how it was important to promote climate adaptation and mitigation practices as a way to make economic gains and attract international funding such as loans. She underlined how it was vital to speak about climate change mitigation in monetary terms in order to attract international actors and the Ugandan government to invest in projects, and as a means to involve farmers and the rest of the population: “If we use the solar, what will you save in terms of the pockets? If you planted the trees, or fruit trees, what amount of money are you saving for your household? If you planted these trees, and you are generating this, how much is that in terms of carbon offsets? We need to learn these things, and think that this is how people can develop an interest in it.” While the government officials disagreed on how the government should access funding, they both implied that funding can strengthen development across multiple sectors and provide adaptation to climate change. Meanwhile, the Hoima District Development Plan 2015/-2019/202, the Agriculture Sector Strategic Plan 2015/16-2019/20, and Uganda Vision 2014 all stressed a need to lift farmers out of poverty by transforming small-holder practices into commercial agriculture and wider markets. These findings suggest that adaptation is viewed as development funding and investment (whether it goes into oil exploration or infrastructure), while neither policy documents nor respondents provide a clear idea of the causes of vulnerability among marginalized groups, nor future climate risks. Farmers on the other hand, have a clear view of their needs and the responsibility of the government to provide this.

6.1.1 How do different interview groups describe climate change and its causes?

In this section I present an analysis of informants’ views of climate change and its causes show how understanding human-nature relations can provide further insight into how power is structured.

While all informants agreed that crop pests and diseases are some of the main challenges to food security, climate change was also viewed as a potential or direct threat to food production. For instance, regardless of whether they were members of farmers’ associations or not, all farmers were familiar with the concept of climate change and expressed a need to adapt to what they described as an unpredictable climate with longer dry spells and heavier rains. “Sometimes you find that there is too much sunshine, which destroys our crops. Sometimes rain is too much. It rains more. We have a problem of climate that is not favoring our farming system,” one female CSV farmer narrated.

All interviewees also described farmers as the group most vulnerable to climate change. At the same time, they agreed that deforestation and the destruction of wetlands were the

main causes of climate change. All respondents also described that farmers were largely responsible for environmental degradation and deforestation. For instance, project staff and government officials at local levels blamed deforestation in Hoima on “poor practices” by farmers and their failure to adopt “modern farming methods”. A local government official narrated: “People will continue to encroach [on forests]. So basically, it is the lack of appreciation of what the trees are for us as a service. As an ecosystem service. So farmers, why do they cultivate in the forest? They feel like these are fertile soils, it is a cool climate. They have ended up losing the fertility in their soils, in their urban lands. And now they are running to the forests.” Still, farmers were not the only group responsible for deforestation, the local government official added. Politicians making money from timber production would sometimes ignore technicians or civil servants who advocate to protect forests, the official stated. This is because they may have economic interests in timber production, or because they are scared of losing voters, the official added. “The politician will come and say: ‘Don’t harass my voters.’ Now as a technical person, your hands will be tied. You fear the politician is your boss, because of the decentralization policy. So if the politician wants to protect his voters, it means you leave them in the forest, you leave them to do whatever they want.”

On the national level, a member of parliament (MP) also addressed deforestation as a result of poverty and described how lack of electricity and other infrastructure force farmers to the forests: “Energy is affecting the population living in those small huts [smallholder farmers]. They are using wood, cutting down trees, and burning charcoal which is causing air pollution, affecting the mothers and the babies.”

This discourse of farmers as causes of degradation is in part internalised among farmers. But farmers also contest the discourse by again pointing to the need for government to provide services. Like the MP, some farmers and village leaders indicated that cutting down trees was mainly a coping mechanism and expressed a need to spread more awareness about the dangers of deforestation and teach farmers other ways of adapting. For example, one non-CSV farmer and village leader described how he needed to access more land when his soil lost its fertility. Another male village leader, also a CSV farmer, expressed how lack of electricity drove farmers to the forests. “We are not Norway,” he said. “You may be using easy wind power. [We] use charcoal burning for fuel.” Government statistics show that only 16 per cent of households in Hoima District had access to electricity in 2014. (Ugandan Bureau of Statistics, 2017).

Most of Hoima’s subsistence farmers live “marginally”, according to Hoima’s Development Plan 2016/2016 – 2019/2020, while 24 per cent of the district’s rural population live under the poverty line. The policy document also addresses how some social aspects such as poverty could make farmers rely on charcoal burning for cooking. Olsson et al (2014) explained how poor households often have no choice but to turn to unsustainable

adaptation practices when their livelihoods are damaged by social or climatic stresses: “More affluent households may be able to capitalize on shocks and crises while poorer households with fewer options are forced to erode their assets. Limited ability to adapt and some coping strategies may result in adverse consequences. Such maladaptive actions undermine the long-term sustainability of livelihoods, resulting in downward trajectories, poverty traps, and exacerbated inequalities,” their study concluded. Another study on farmers’ “illicit” coping practices in Kenya by Eriksen and Mosberg (2015) suggested that policymakers and other actors should take into close consideration why people turned to ‘immoral’ or unsustainable coping practices.

The analysis of interview findings indicate that contrasting worldviews may illustrate a relationship between farmers and local actors where the latter see their expertise as a way that can prevent farmers from cutting down trees. Statements by local authorities describing adaptation responses as teaching farmers ‘modern farming’ techniques may undermine the idea of social adaptation strategies as a response to climate change.

To conclude this section, I argue that the question of what causes climate change shows how some groups are as the causes of degradation and climate change. The discourse of the farmer as someone who is ‘degrading the environment’ legitimizes the government’s decision-making in natural resource management and farming. It can also reflect a struggle for authority over who can legitimately make decisions concerning farming and development.

6.1.2 Women and climate change

In this section, I present how the men and women interviewed view the impact of climate change differently, and how this can serve as an example of how traditional gender roles may close down opportunity for the equity of women in farming.

As discussed in the literature chapter, dominant development and climate change responses seem not to emphasise the social vulnerability of farmers, which is a major concern among women (FAO, 2017; Karlsson et al, 2017). For example, findings from interviews indicate that women farmers were more concerned about the effects of climate change than their male counterparts. While all five women farmers, plus the female village leader, had experienced that heavier rains or longer dry spells, as a result of climate change, had damaged their crops, five out of the seven men interviewed in the district, both farmers and local leaders, did not believe that the current climate was having a large-scale effect on farmers. For example, two male village leaders, who were also farmers, stated that while they worried about the future of climate conditions, the climate was now “good”. Farmers had “enough rain” because of tree planting initiatives orchestrated by government and other actors, claimed a male farmer and a male local government official.

While men were less concerned about the impacts of climate change, women explained how their livelihoods had been affected by changing weather patterns. This can illustrate some underlying equity issues deriving from how men and women perceive each other's roles; women as responsible for food production, and men as income generators.

6.2 What do respondents view as “good” or “bad” forms of agricultural practices, and what do they consider the best way to promote and implement them?

The above analysis shows that views of development and climate change emphasized farmers' position as causes of environmental problems, while causes of the marginalisation and vulnerability of farmers were seldom considered. However, an analysis of what respondents view as 'good' or 'bad' agricultural practices revealed that while some farmers argued that, with the right tools, they would be better equipped to sustain their livelihood, most farmers, government officials, and project staff considered the innovation of researchers, such as improved seeds, as the most important way to adapt to climate change. This positioning of farmers as causes of climate change may have influenced power relations of *recipients* and *experts*.

As mentioned above, the interview findings show a consensus among interview groups that food security is a vital component of “good” development, and that access to food is threatened by pests, diseases and climate change. The majority of respondents in all interview groups went on to describe that commercial farming, technology such as improved seed varieties, and access to funding were the most important tools needed to achieve overall food security. Project staff and government officials in particular emphasized the need to invest in, improve, and distribute more technology, including improved seed varieties, storage facilities, and irrigation practices. Local actors, including project staff and local government, explained that farmers should be “organized” into groups where they would receive training in practices developed by agricultural technicians. This problem understanding also reflected a particular positioning of farmers as “recipients” of development and knowledge from experts. National actors agreed, but added that farmers should use the groups to learn from each other: “In rural areas, most of the people are illiterate and have not come very far with education. So it is easier for them to learn from farmer to farmer than bringing these people to the workshop. So when you take the farmer to see something, they will be able to copy. So sharing experiences and learning from each other is very important. If you have a vision for your family, this will excel to your community and the community will forward development.” Furthermore, a local government official stated that adaptation of modern methods of farming should be practiced by smallholders. Some farmers, the official added, were unwilling to change their practices. However, the limits to adaptation are complex and are rooted in local culture, the official argued: “People say: I grew up seeing

my mother do this, I grew up seeing my parents cultivate this soil. So you come up with your modern methods and try to train them. They say: 'No, that is nothing. For us, we've been doing it this way.' Not knowing things have changed, the population has increased. Land is no longer available as it used to be in the past. So now you are telling them on this small patch of land that you are remaining with, you can do this kind of intensive practices. They do not want to take up that."

Some farmers, however, contested how the use of seed technology was necessary for adaptation, and implied that farmers, in fact, were capable of adapting, and not just 'receivers' of support. For example, farmers need access to tools that they can use to adapt themselves, one female CSV farmer argued. In her experience, the local seeds provided higher yields than the demo seeds distributed by the project. She expressed that farmers did in fact need technology, but that technology in their eyes were tractors and other machinery that could support them in the field. Spraying and digging are heavy work, she explained. Nonetheless, she described the adaptation training she received through her farmers' group as helpful: "They try to develop the farmers' minds in farming systems. They have improved."

To conclude this section, I argue that the common view of technical inputs like improved seed varieties and training produced by organizations and government being the best methods of adaptation to climate change indicates an uneven power structure where an expert hierarchy casting farmers as 'receivers' of support is reinforced through subjectivities. These subjectivities cast project staff and government officials in 'expert' roles and as decision-makers responsible for organizing the farmers into groups.

6.2.1 Commercial farming versus smallholder farming

The section above illustrates how commercial farming, technology produced by researchers, and training offered by organizations and government were commonly viewed as the "best" farming practices among all respondents, and how these views indicated an expert-hierarchy where farmers were 'receivers' of support. Here, I present how commercial farmer as a 'role' may reproduce the subjectivities labelling smallholders less 'capable' or 'passive.'

Commercial farmers were most commonly described in all five interview groups as the actors on the ground with the best abilities to boost food security. The male MP stated: "You cannot have food security unless you do serious commercial farming based on sustainable land management. I look at food security in three ways; for me to say someone is food secure, that person must have food for market, that person must have food for domestic use, and that person must have food for emergencies. Our agriculture is rainfed; we rely on rain, we don't have a lot of irrigation, and sometimes there is an emergency. Emergency in the context of Uganda can be a long period of drought, maybe six months. If we have a six-

month-long dry spell, do we still have food at home? If not, I will say that person is food insecure. In the 80s and 90s, there were also conflicts that would interrupt food systems, the LRA [Lord Resistance Army] war in Northern Uganda, the ADF [Allied Democratic Forces] in Western Uganda – these are all emergencies. So for such emergencies, like influx of refugees from Congo, will you still have food for both of them? We don't have food for that emergency, we are not food secure. So this is how I look at food security."

Like the majority of respondents, the smallholder farmers themselves also deemed commercial farming more efficient for food security than subsistence farming. Commercial farming generates income, which is important for "good" development, all ten farmers and the two village leaders, who are also farmers, contended. Commercial farmers, a male village leader stated, are the "real farmers who dig." Both male and female farmers pointed out how men often practiced commercial farming, because they were mainly "concerned" with generating income from agriculture. Most of the women also expressed that they wanted to expand on their agricultural production to sell their food at markets. However, it is not easy to become a commercial farmer, some of the smallholders argued. A lack of loans made it difficult to practice larger-scale farming, three farmers argued. Project staff and a local government official also pointed out challenges with turning farmers into commercial actors; in order to practice commercial farming, you need easy access to markets and storage, which smallholders currently do not have, some of them pointed out.

While most respondents agreed that commercial farmers were key to achieving food security, one project worker contested this notion. The two project staff disagreed on how they viewed commercial farming and food security. The male project worker argued that small-scale farmers currently contribute the most to food security, especially in the context of Hoima, where only five per cent of farmers are commercial producers, and 75 per cent are engaged in subsistence farming. (GoU, 2015) "That's their [smallholders] engagement - food production all the time. And they are many, they are the majority. We don't have many of those large-scale commercial farmers. But I have a fear that in the long run, they [the smallholder farmers] will not be able to support us." The other project worker, on the other hand, disagreed and stated: "They [smallholders] normally grow food for their home, and their market is small. They buy and sell small items like salt, sugar, soap, then that's all. When someone has two acres, they cannot do much." Meanwhile, the national and district policies reviewed in this study supported the latter notion and emphasized a need to transform small-scale agriculture into commercial activities. Uganda Vision 2040 (2013) lays out that one of the country's main ambitions is to commercialize subsistence farming: "This will make agriculture profitable, competitive, and sustainable to provide food and income security to all the people of Uganda. It will also create employment opportunities along the entire commodity value chain of production, processing, and marketing," the policy stated. At district level, the Hoima Development Plan 2015/2016 – 2019/2020 described subsistence

farming as an obstacle to development because it is one of the factors that keep the district's rural population in poverty, while describing commercial farming as "progressive".

Literature on transformation argues that adaptation is often viewed as a means to preserve economic development, rather than enhancing social development. Pelling (2011) for instance, argued that "dominant development discourses" tend to "put the economy first", which undermines the development of "governance that seeks to incorporate the interests of future generations, non-human entities, and the marginalized." While the majority of smallholders interviewed expressed a wish to earn an income from farming, some of the tools they need to achieve this, such as improved roads, storage, and loans, are either not in place or out of reach. Still, it is mainly those who have the privilege of practicing commercial farming who are viewed as 'progressive' or 'capable', strengthening the role of smallholder farmers as 'incapable'.

6.3 Gender differences in agricultural activities

Views of development, in particular of the privileged status of commercial agriculture, coincide with inequitable gender relations. In this section, I address how respondents view the role of women and men in agricultural development and in general and identify the main differences between interviews with men and interviews with women.

Men and women described gender roles similarly; as mentioned earlier in this chapter, men tend to be cast in roles like 'commercial farmer' by the majority of both male and female respondents. Men, all respondents explained, are mainly responsible for a household's income generation. Women, on the other hand, were cast in supportive roles by farmers, local leaders, project staff, and government officials, who described women's roles as those responsible for the upbringing of the children and food production for the household. For example, a male project worker explained how his wife made it possible for him to pursue his career: "For me, their role is supportive. My wife is focusing on feeding the children very well, and it relieves me so that I can focus on other things. I can focus on making sure that they have a good home, that there is enough money to educate the children. So, their role is that primary support for the family to exist, create an environment for other things to happen, create an environment for men to work."

The main differences between men and women in interviews were how each group perceived men's and women's abilities in agriculture, and their extent of access to development input. Male farmers argued that they were the most 'capable' of practicing commercial farming; men do the "heavy work" and "digging", male respondents across all interview groups argued. One out of the nine women individually interviewed supported this view; a female village executive committee member, also a farmer, argued that women had been "lagging behind" in terms of farming responsibilities.

One male farmer, however, argued: “There is no job that cannot be done by a man or a woman. But the rate differs. And their speed of performance. For example when you are harvesting coffee, the women cannot harvest at the same rate as the man.” Still, most government officials and project workers viewed women as the most ‘vulnerable’ to climate change, mainly due to their role as producers of food for the household.

However, the majority of women challenged the notion of men being more ‘capable’. For instance, women viewed themselves and other women as more ‘capable’ of handling agricultural inputs such as loans or seeds, and female respondents often described men as less ‘trustworthy’ than women. Particularly in terms of support like micro-loans, a female project worker explained: “Men, they have so many many things to spend it on,” she said. The project worker explained how one farmer, who was financially supported through a CSA project to run a piggery, spent the money on alcohol, among other things. The pigs died as a result of neglect, she added. She also pointed out that some farmers who are supported by microloans refuse to pay interest. “You may find that women, at least, try,” she said.

While women viewed themselves as more pragmatic than men in terms of planning and using inputs, they argued that their adaptation to climate change was constrained by social factors. Two female respondents – a project worker and a central government official – argued that women were disadvantaged in their ability to adapt to climate change because of their limited land rights. In rural Uganda, it is estimated that women own 4 percent of the land (Acosta et al, 2015), which makes it difficult for them to control and access resources. One example of how land rights can affect women’s access to methods for adaptation can be illustrated by the subjectivities of a male village leader. According to him, men receive 90 per cent of all agricultural input distributed by organizations and local authorities. The male village leader also argued that men are entitled to this support because they “own the land” and thus decide how to cultivate it. “The wife has to serve the orders of the husband,” he said. Meanwhile, the female project worker expressed how such attitudes could curb women’s ability to adapt to climate change and take part in and co-decide on the development of rural communities. She narrated: “Most of them [women] have to seek permission from the husband to use the land. Even when it comes to my mum, she cannot – there was a time when she wanted to plant pineapples, so she planted them around the garden [...] so when my dad came [...], he was like: ‘ah, who told you to plant pineapples in this garden? I had another plan for this garden.’ And my mum felt bad. So for me, I don’t have any rights for this garden.”

While women are restricted in their land rights and arguably as a result, their level of adaptation, the majority of male farmers stressed how men were those most in need of support because of their more extensive land rights, but also because they tend to farm on a greater scale. During an informal conversation with two local CSO workers, who both work with agriculture and livelihood programs in the district, it was stated that men generally had

more access to agricultural input and support distributed by government in the Hoima District. Meanwhile, male and female CSV farmers argued that men and women received the same level of support from NARO.

I conclude this section by arguing that the interview findings above may indicate that trends in subjectivities and values can close down spaces and opportunities to transform the way that women's equity is addressed. As men are generally described as more "capable" of practicing commercial farming and commonly viewed as the most important food security tool, and women lack access to land and decision-making bodies, women are excluded from using and sharing their experiences with climate change. Furthermore, the casting of women in roles as "vulnerable" by authorities and project staff may also prevent current equity issues from being properly addressed by projects. While Uganda has worked to mainstream gender issues into sectorial policies, cultural perceptions of women as "incapable" may maintain their exclusion from actively taking part in developing and improving adaptation responses. According to Eriksen et al (2015), people and groups need access to "emancipatory" subjectivities that cast them in "active roles" in order to enhance their "co-production" of climate change responses. When women have access to platforms where they can voice their experiences, they can also challenge "business as usual" and their roles and subjectivities as 'passive' can be contested. This could pave the way for agricultural transformation towards social adaptation and equity.

6.4 Who do respondents perceive as important development actors?

Previous findings indicate that commercial farming, technology, and training were viewed as the most important practices for agricultural development. In this section, I provide further examples of whom respondents recognized as decision-makers and vital actors in development processes, and whose knowledge they considered the most important in development initiatives. By asking the question of 'who' or 'what' they saw as the most important development actors, I was able to indicate how subjectivities and roles can help shape power relations in CSA.

As stated above, the farmer community was recognized as an important contributor to development, according to government officials and project workers. However, each group, excluding farmers, considered their own group as the most important development actor, with the exception of a few respondents.

The central government officials interviewed argued that development initiatives and guidelines should be decided by and come from central government. The government should partner with international and domestic organizations or the private sector for funding and implementation. The three respondents further described funding as one of the most vital tools that needed to be

obtained before development and climate adaptation could take place.

Two informants explained that their role entailed convincing donors and government departments to invest in climate change responses and development projects. Still, the male MP stated that the citizens were the most important development actors, but that they should obtain knowledge from the government, and then share this knowledge with other farmers.

Meanwhile, **local government actors** viewed central, local, and lower government officials as the most important development actors because they carry out agricultural research and the local government implements adaptation through training and extension work according to current policies. The farming community also plays an important role in sustainable development, argued one local government official. Still, the role of smallholder farmers, the official said, “is to embrace government programs.”

Project staff viewed research publications as well as their own research as the most important sources of knowledge used to shape development practices. Both individually interviewed project workers argued that researchers and project staff were most in need of support if a society was to develop its agricultural sector in a sustainable manner. As one male project worker put it: “As a researcher, I use the statistics from the statistics department, published information, or the internet to find publications. But if I’m a farmer, the source of info is in these research institutes. Because information begins here. So if I am farmer who needs information, I need to come here. So it depends on who I am.”

When **village leaders** were asked who they deemed the most “important” development agents, the male respondents said: “It is us, the leaders.” This, he explained, was because they assist in the organizing of farmers into groups and cooperate with local politicians, and the female village leader agreed. However, local government had the key knowledge, they stressed.

The **farmers** mostly concurred with the views represented above. While all the farmers recognized a need to adapt and combat deforestation, most of them explained that they relied on organizations and extension workers to approach them and provide training. One female farmer, however, stated that “us, the farmers” were the most important agents of development.

While all individual respondents described technocrats and government as the providers of development and knowledge, farmers were often labelled “receivers”, “implementers” or “beneficiaries”. These labels also appear in national agriculture policies and the Hoima District’s own development plan, where government is portrayed as the main provider of knowledge to farmers and smallholders are cast in a ‘passive receiver’ role. In the national policy Agriculture Sector Strategic Plan 2015/16-2019/20, the word “smallholder” is

mentioned in combination with words like “challenge”, “vulnerability” or “unable”. Smallholders are to be integrated into “larger value chains and thereby achieve agricultural transformation” with the help of government and/or the private sector, the policy states. The phrase “smallholder farmer” is mentioned 32 times in the policy document, and was once associated with “ability to pay back loans”, but never in combination with words like decision. Meanwhile, one project worker and one local government official described farmers as “too stubborn to join groups” and “tricky to work with”. The project worker said: “You know dealing with farmers is a bit tricky. If we give them money to do agriculture, then they use it for other things,” the project worker said. Lack of trust was also brought up by a farmer respondent. The non-CSV farmer explained why he refused to join a farmers’ association: “There is the misappropriation of funds. They don’t work for the community, they only work for their own stomachs.” The Hoima Development Plan 2015/16-2019/20 also described this inter-farmer relationship as a challenge to development, where “poor group culture” acts as a barrier to agricultural development.

The majority of government officials, project staff, and farmers concur that development and knowledge should come from organizations and government. This notion corresponds with other findings, such as how farmers are cast in roles like ‘passive receivers’ of support. These values and subjectivities may reproduce an expert-hierarchy.

6.5 Women in policy

As stated earlier, women were viewed by the majority of government officials and project staff as the most ‘vulnerable’ to climate change. In this section, I further explore how these subjectivities and roles are reproduced in policy and, based on interview findings, in the social world.

Women play a vital role in agricultural production in Uganda, and make up the majority of smallholder farmers in the country (FAO, 2017). Their inclusion in agricultural decision-making is therefore crucial for sustainable development and agricultural transformation. (GoU, 2016) Since 1997, Uganda has worked to mainstream gender inclusion into policies across all sectors, and has developed several policies to make sure that gender issues are included in budgets and planning (FAO, 2017). Despite these efforts, earlier studies on gender and policy describe Ugandan national policies on agriculture, climate change, and land and environmental management as “gender blind”(Acosta et al, 2015; FAO, 2017). One study found that gender issues were largely described as “women problems” in national policy, where women were also branded “vulnerable” or “marginalized”. These labels can reproduce subjectivities and stereotypes, as well as be “counterproductive”, according to a report on Uganda’s representation of gender issues in national policy by Acosta et al (2015):

“These stereotypical characterizations might reinforce gender inequalities and even become counter-productive. For an improved exercise of gender mainstreaming, gender issues in agricultural policies should incorporate men’s, women’s and youth challenges, opportunities, perceptions and preferences.” (Acosta et al, 2016)

However, a recent national planning policy addresses the need to include women in agricultural development decision-making. The Agriculture Sector Strategic Plan aims to include women in decision-making processes that affect “planning of the household-agro enterprise(s).” (GoU, 2016) At district level, the Hoima Development Plan 2015/2016 – 2019/2020 acknowledges that women play a key role in agricultural production. It states that policy actors aim to improve the inclusion of rural women in decision-making, and explains a need to give women a bigger role in development: “They [women] will also play a leading part in those DDP activities, which aim at increasing the opportunities of the rural population to start up new businesses, diversify, and expand the household level economic base. Women have proved themselves interested in and capable of taking on an entrepreneurial role that enhances family income and well-being.”

While men did not mention the importance of including women in decision-making processes, female government officials and the female project worker expressed a need to provide women with access to management bodies for the environment and land rights, and a need to include women in the development of the agricultural technology and innovation which they so often use. The limitations placed on women affect their ability to adapt, they argued.

When asked if men and women farmers have different needs and access to support, the female central government official argued that the government mainly focused on the number of women who benefit from inputs. “But there is no design of technologies that help women in committing to adaptation,” she added, and continued: “Many youth, many men, have been disappointed by climate change – they fail here, they fail there – the solution is to sell the land and buy a motorcycle. But remember that the women are left to look for food,” she says, and brought up another issue: “Recognition of the time a woman spends looking for firewood, and the time she spends looking for water, we don’t culturally credit them. For us it’s just the food on the table, well cooked: ‘yeah, that is a good woman.’ [...] Even when we look at some of the commercial products, clean technologies like solar adoption, you find that women can’t access them. Women are really left out,” she said. Furthermore, the private sector, which often develops adaptation technologies, “is for men alone,” she argued. “There are few women who have invested in some of these technologies. For example, if you come with your education, or you want to generate some hydro station, it is not easy for you to be cleared [...]. If more women could be involved in such things, the design would also be women friendly.” She is also critical of how most of the committees on natural resource management is made up of men “because they are the owners of the

land,” she said. “We are just starting to say that women also have a stake [...]. The recognition of their efforts are so important.”

Acosta et al (2015) supported her statement: “Women [...] face disproportionate access to technologies, knowledge, information and other extension services, including financial opportunities, credit and insurance (Acosta et al., 2015).” Furthermore, a report by FAO argued: “These gender-based inequalities can threaten women’s access to the assets needed for adaptation.

The interview findings presented in this section further suggest that women have limited access to platforms where they can contest “business as usual”, including their roles as ‘vulnerable’ and ‘incapable’, as well as the opportunity to use their own knowledge to improve their own adaptation. Moreover, a focus on equality over equity may indicate that issues of equity are overshadowed by the government’s focus on the number of women benefitting from a project or specific support.

7.0 The implications of worldviews, values and subjectivities for the Hoima CSV learning site

In this section, I discuss how the worldviews, values, and subjectivities described in the above sections are translated into the Hoima CSA project: Do they reinforce or challenge authority relations, alternative values, and development knowledge?

7.1 The role of farmers in the CSA project

While the worldviews presented in the previous chapter indicate that respondents recognize a need and a willingness to adapt to climate change, findings also suggest that the CSA project in Hoima reinforces an expert-hierarchy, where technocratic solutions to climate change are in focus, and the role of government, researchers, and project staff is to produce knowledge and guidelines that they then pass on to farmers. Central government officials and farmers also argue that smallholders have limited access to platforms where they can share their experiences with and concerns about CSA. I argue that that these power relations are reinforced through the following:

1) The values of respondents:

- how government officials, project staff, village leaders, and smallholders value project workers and government officials as the most important development actors and sources of information,

- the common view that commercial farming, which many respondents argue is mainly practiced by men, is the key to food security and adaptation, and how some of these perspectives are also reflected in policy documents;
- 2)** worldviews that perceive farmers as the cause of environmental degradation and climate change; and
- 3)** how subjectivities deriving from the above worldviews and values cast small-scale farmers, especially women, in passive roles as receivers who depend on support and training from authorities, organizations, and model farmers.

These findings are further illustrated by how some of these values, worldviews and subjectivities are translated in projects, or the *practical sphere*. For instance, I argue that the differences in how CSV farmers and non-CSV farmers perceive their role in projects can demonstrate how authority relations risk closing down spaces for transformation. While project staff argue that farmers have platforms, like farmer field days, where they can interact directly with organizations and local authorities, farmers and central government officials express that farmers have limited ways of addressing their concerns.

One example of this is how two farmers in the focus group opined that the distribution of improved mango tree seeds was poorly planned. One male and one female CSV farmer argued that the seeds dried up, but that they had few people to turn to with their concerns. It is important to note, however, that the agricultural sector in Uganda is underfunded, leaving extension and project workers with limited means to reach out to people. The extension-farmer ratio in Hoima is one extension worker per 1,293 people (GoU, 2015). Moreover, CSV farmers interviewed for this study explained that they relied on model farmers and organizations to provide them with improved seed varieties and training in what one male farmer described as “how to predict and plant according to the weather.” Although most of the farmers stated that the support was “useful” or “good”, they argued that they were limited in their ability to engage with project staff and voice their opinions or make further inquiries. In the event where they did engage directly with project staff, their inquiries were not followed up, they claimed. Meanwhile, project staff expressed that farmers had the opportunity to engage with both project staff and local leaders at farmer field days, and that farmers’ requests were often difficult to meet because they were “unrealistic” or “not practical”.

This observation of farmers as passive receivers of support in the CSV project stand in contrast to the case of a female farmer who participated in a different agricultural project in Hoima. The farmer expressed that her ‘active role’ in a local agricultural project enhanced her feeling of inclusion and project ownership, and strengthened her ability to adapt through active participation and project decision-making. The farmer narrated that she had been appointed the role of volunteer by her organization. As a volunteer, she was

responsible for spreading awareness about nutrition and agricultural adaptation practices in her area, as well as recruiting new volunteers and members. During her interview, she proudly wore a t-shirt with the organization's logo, which she explained was important for her to wear; it made her visible to farmers who had questions about agriculture or the project. She further expressed how members of the project were invited to voice their concerns and inputs to project staff, which she argued resulted in improved project and agricultural planning as well as improved yields.

Thus, her role provided her with the feeling of ownership to the project, enhanced her ability to voice her concerns and share her experience may have opened up space for the contestation of the current practice, and as a result, transformed the outcome of the project. By providing too few platforms where smallholder farmers may express concerns about the CSA, one can risk closing down spaces for alternative values, worldviews, and knowledge, and reinforce subjectivities such as 'passive farmers' and 'receivers'.

7.2 Gender, equality, and equity in the CSV

Findings also suggest that subjectivities and perceptions of who respondents consider important development actors can close down spaces for women's active participation in projects. As I discussed above, commercial farmers were viewed as those capable of achieving food security and income, which was also viewed a man's responsibility. Meanwhile, women were viewed by some government officials and project workers as the most vulnerable to climate change.

While both male and female CSV farmers stated that men and women had equal access to CSA support (with the exception of the male village leader, who stated that men often received 90 percent), the men also argued that male farmers were entitled to support because they own land and were more capable of practicing commercial farming.

Meanwhile, one woman farmer and all female government and project respondents argued that men tended to abandon their farming responsibilities, leaving women to take on heavy workloads. The two latter groups argued that women's lack of access to land, development of innovation, and decision-making processes prevented them from properly adapting to climate change, and also strengthened their vulnerabilities. This can perhaps illustrate why, as discussed earlier in this chapter, the people who expressed that they had lost crops because of unpredictable weather, droughts, and heavy rains and struggled to adapt to climate change were mostly women, while men were less concerned with climate change, and why more women than men expressed that they wanted more training on CSA.

Moreover, claims of women's heavy workloads and limited time to engage with leaders and attend village meetings may also explain why non-CSV women were not members of

farmers' associations; the women who were not a part of farmers' associations had never heard about them, although other residents in their villages were CSV farmers. They further expressed that they would like to join if they were introduced to the project. One woman farmer explained that she usually heard about agricultural projects after they had finished. She did not have time to attend village meetings because of the heavy workload on her farm, she said. Meanwhile, a male farmer explained that he had chosen not to join a group because he did not trust fellow farmers, while another man explained that his job as a teacher did not leave him with enough time to participate in associations.

Respondents from the farmer, project staff, and government official groups touched on how a lack of equity limited women in their ability to adapt to climate change. As a male national government official expressed it: "In my opinion, we [the people of Uganda] have progressed beyond the issues of gender. [...] We are now talking about gender equity."

8.0 Conclusion

The main research question for this study is: How can a Climate-smart agriculture (CSA) project support or constrain agricultural transformation in the face of climate change? -In order to answer this question, I chose to use CCAFS's Climate-smart villages project in Hoima District as a case to illustrate as an example, where I collected empirical data through qualitative interviews to identify how values and worldviews of CSA actors, including government officials, project staff and farmers shape decisions that affect agricultural transformation. Findings suggest that uneven power relations within and around the CSV project in Hoima risk closing down spaces for agricultural transformation in local farming communities. These power relations form an expert hierarchy that risk reproducing subjectivities that may constrain smallholder farmers, especially women, to be active participants in a project that contribute in shaping their adaptation to climate change. I have added a more detailed summary of the main findings below.

This study defines agricultural transformation as an inclusive and collective action that promote both equitable solutions to climate change vulnerability, addressing both technical and social adaptation responses. This view of agricultural transformation requires CSA actors to see climate change issues as an adaptive challenge (O'Brien, 2018) as well as identify the need for radical change (Pelling, 2011). According to O'Brien (2018) adaptive challenges address "a new way of viewing" climate change impacts and its solutions. In short, policymakers and scientist should see adaptation to climate as a social and political issue, rather than as a technical problem (Pelling, 2011). Agricultural transformation in the face of climate change should therefore address the worldviews and values behind the "mindsets" and political factors that shape how we decide on how to adapt to climate change (O'Brien, 2018) For instance, the personal and collective worldviews and values of

the actors of an agricultural project shape the power relations in and around the project, which in turn form the social root causes of vulnerability to climate change, or strengthen their resilience and ability to adapt. For example, uneven power relations risk reproducing inequity and poverty (Karlsson et al, 2017). I have therefore argued that agricultural transformation must be addressed through the three spheres of transformation framework; the personal sphere (worldviews and values), the political sphere (systems of governance) and the practical spheres (how adaptation is observed or measured on the ground). Power relations are a product of how these spheres interact (for example, a capitalist worldview with economic values may result in policies favoring the economy over environmental issues, and affect how many people produce food (O'Brien and Sygna, 2013; Egmont and de Vries, 2011). Meanwhile, subjectivities can identify how worldviews and values of the actors represented in an agricultural initiative, from the politician to the farmer, label other actors, and how they position each other in terms of, for instance, how they perceive the others as development actors (who are the most important development actors, and whose knowledge is the most valued?) through everyday interactions. It is through how these interactions and labels are contested or reinforced that power relations are produced (Eriksen et al, 2015). The findings of this study suggest that uneven power relations in the Hoima CSV project risk constraining agricultural transformation. This is illustrated by how actors such as policymakers, i.e government officials, at both national and local levels, as well as project staff and local leaders, describe themselves as the main sources of knowledge and authority, and label farmers as *passive receivers* of knowledge and support. These subjectivities are then reinforced by lack of platforms where farmers can share their own experiences, and contest their roles as well as current knowledge systems. However, some conflicting views were presented in relation to this scenario: Project workers stated that farmers were regularly invited to farmer field days, where they had an opportunity to engage directly with organizations and authorities. In contrast, nine out of ten smallholders and two central government actors expressed that small-scale farmers have few platforms where they can voice their concerns and share their experiences directly with project staff and authorities. Still, when the smallholders have this opportunity, their concerns are rarely acted or commented on, farmers argued. This study suggests that while farmers were not in practice included in decision-making, they also remained mostly passive recipients of information, even in participatory exercises.

The An investigation of worldviews show how they way the respondents see the world and its potentials are intimately linked to subjectivities and values. The worldviews represented by respondents in this study saw climate change as a threat to food security, and deemed environmental degradation, often described as deforestation, as the main cause of this. They also saw farmers, and especially women, as the group who were the most vulnerable to climate change, mainly because their livelihoods depend on the sustainable management of natural resources. Although men and women expressed that they experienced the impacts of climate change differently, they all

acknowledged a need to adapt to, and apply measures that can reduce, the impact of climate change. Findings can indicate that CSA has, to some extent, opened up for transformation beyond technological means among farmers in associations in Hoima. For example, CSV farmers point out the importance of human interaction with nature, and how poverty is the cause of vulnerability that drive farmers to cutting down trees. Still, only a few respondents, mainly women, emphasize that there are other root causes to vulnerability, like how for example women are deprived of essentials to adaptation, including access to land, while local and national policy documents fail to address the underlying worldviews and values behind gender subjectivities, and mainly called women vulnerable because they make up most of the agricultural sector in Uganda. While poverty was addressed as a reason for maladaptation (farmers cutting down trees to access fertile land), respondents and policies reviewed fail to address the root causes of poverty. Moreover, subjectivities among respondents casting women in roles like vulnerable and incapable may suggest that values and worldviews hamper equity, which in turn risk closing down spaces for agricultural transformation. The subjectivities directed at smallholders also pose a challenge to the level of inclusion of farmers in deciding their own fate, as the hierarchy of knowledge may reduce their active participation by undermining their opinions or concerns, which risks excluding them from actively participating in decisions related to the future of their livelihoods. According to Eriksen et al (2015), “there is a need for disadvantaged groups to have access to subjectivities that cast them in active roles rather than as either victims or villains in responding to environmental change, as well as policy and science making forums wherein different knowledges are contested.” This means that when “disadvantaged groups” have access to “emancipatory subjectivities,” it becomes easier to foster their inclusion, as well as diverse values and backgrounds in decision-making processes, to shape adaptation actions that also address issues of social equity. (Eriksen et al, 2015)

I further argue that this study adds to Meadows (1999) and O’Brien’s (2018) understanding that mindset (or worldview) is a leverage point for transformation. The connection between subjectivities of farmers as responsible or irresponsible, active or passive in driving development, or environmental stewards or as degrading – are linked to the worldview of respondents as well as power relations. These findings can illustrate that transformation is more than an interaction between personal, political and practical dimensions, but is also about the way we see each other as actors, and how we chose to address and interact with each other. I also believe that the findings of this study adds to Pelling’s (2011) theory about transformational adaptation as having to be radical. Findings for example suggest that, instead of women trying to claim the same land rights as men, or be more involved in decision-making processes, the whole mindset of society and policies must transform in order to get rid of subjectivities that make women having to claim their rights in the first place.

I also argue that another key finding of this study is how implications for our understanding of how adaptation interventions can help drive transformative adaptation, by paying greater attention to the worldviews and values that steer our mindsets. I also argue that this case study also can illustrate how worldviews and values can contribute to reproducing vulnerability, rather than reducing it, and provide further understanding to Atteridge and Remling's (2018) theory of adaptation as a redistributor of vulnerability. Future research on agricultural transformation, equity and power relations could be to further empirically assess how project decision-making forums can address subjectivities, and how one can use the three spheres of transformation to develop frameworks that specifically deal with maladaptation across time and scale.

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Appendix

Interview guide farmers

Theme	Themes broken down to categories	Questions	Answers
			Farmer: Gender: Age: Village:
Worldview – how the person understands and sees the world and its potentials	Modernisation/innovation, economic, traditional, environmental/healthy planet for all, cultural, relationships between nature and economics and innovation, importance of innovation or traditions	<ul style="list-style-type: none"> • How long have you been a farmer? • What is you education background? • How important is the weather for your farming? 	

Value – what’s important	<p>Background, education, cultural norms – the glasses through which you see the world.</p> <p>Socially collective “greater good for the greatest number of people”, egocentric, environmental, economic, egalitarian/collective, individualist, self-interest, altruism, traditionalism, and openness to change, collective, self-minded values, gender equality/equality for all</p>	<ul style="list-style-type: none"> • What do you think are the main causes of climate change? • What do you think is the best solution to climate change? • What, in your opinion, is a well-developed society? • And what, in your opinion, are the best ways of achieving “good” development? • Do you think that society needs to adapt to climate change?
Knowledge “where or who do they listen to in terms of knowledge”	<p>Religious/spiritual leaders, scientific/expert, local/traditional knowledge, peers/friends, cultural or religious leaders, socially structured knowledge,</p>	<ul style="list-style-type: none"> • Are you familiar with Climate Smart Agriculture? • From whom do you get the most important knowledge about how to tackle climate change or other environmental • From who do you get the most important knowledge about how to tackle development issues? • When debating or shaping policy on environment and food security, who do you consult?
Subjectivities – shaped from a person’s values and worldviews	<p>Stereotypes, labels on cultural groups and professions, perceptions of key actors to achieve adaptation, assets/drivers of change, perception of gender roles</p>	<ul style="list-style-type: none"> • What/who are the most important actors contributing to “good development”? • How do you view women’s role in agriculture? • How can women contribute to sustainable development? • How do you view men’s role in agriculture? • Who/which actors can contribute to improved food security? • Who should receive technical and financial support in terms of food security?
Inclusion/having a voice	<p>Ownership/participation in agriculture projects, influence in decision-making/extent of having a voice in the community</p>	<ul style="list-style-type: none"> • How do you feel when people from outside your area start agriculture projects in your community? • To what extent do you feel like you have a say in agriculture projects? • How often are you approached by local leaders like village leaders or politicians? • To what extent do you feel like your interests are heard by your local leaders? • Does someone in your community have more influence with the local politicians or leaders?

Needs, access	Community needs and personal needs, access	<ul style="list-style-type: none"> • Who in your area has access to agricultural input like technology, money, seeds? • What inputs do you have access to? • Do you feel like the projects meet the needs of your community? • Can you give an example of a project that did not fit well? • What kind of support do you need? • What are the main needs in your community? • What do you farm? • Do you have any other means of income?
Household level	Personal responsibility	

Interview guide government officials and project staff

Theme	Themes broken down to categories	Questions	Answers
			Position: Age:
Worldview – how the person understands and sees the world and its potentials	<p>Modernisation/innovation, economic, traditional, environmental/ cultural, relationships between nature and economics and innovation, importance of innovation or traditions/environment</p> <p>Background, education, cultural norms – the glasses through which you see the world.</p>	<ul style="list-style-type: none"> • What is your profession? • What is your education background? • Do you have a background in agriculture? • Where did you grow up? In a farm/rural area, a city? • Do you have land where you currently do farming? • What do you think are the main causes of climate change? • What do you think is the best solution to climate change? • In your opinion, what is the relationship between nature and economics? Do you view them as one system or two separate systems? • What are the biggest challenges to food security? 	
Value – what’s important, what	<p>Socially collective “greater good for the greatest number of people”, egocentric, environmental, economic, egalitarian/collective, individualist, self-interest, altruism, traditionalism, and openness to change, collective, self-minded values, gender equality/equality for all/egalitarian, healthy planet for all, economic development</p>	<ul style="list-style-type: none"> • Think back to when you started your position, what were your visions then? Have they changed? • What, in your opinion, is a well-developed society? • What, in your opinion, are the best ways of achieving “good” development? • Do you think that society needs to adapt to climate? • 	

<p>Knowledge “where or who do they listen to in terms of knowledge”</p>	<p>Religious/spiritual leaders, scientific/expert, local/traditional knowledge, peers/friends, cultural or religious leaders, socially structured knowledge,</p>	<ul style="list-style-type: none"> • From who do you get the most important knowledge about how to tackle climate change or other environmental • From who do you get the most important knowledge about how to tackle development issues? • When debating or shaping policy on environment and food security, who do you consult?
<p>Subjectivities – shaped from a person’s values and worldviews</p>	<p>Stereotypes, labels on cultural groups and professions, perceptions of key actors to achieve adaptation, assets/drivers of change, perception of gender roles</p>	<ul style="list-style-type: none"> • What/who are the most important actors contributing to “good development”? • Who are the most vulnerable to climate change? • What does the term small-scale farmer mean to you? • What, in your opinion, what is the main role that small-scale farmers play in society? • How do you view women’s role in agriculture? Are men and women’s roles different? • Do men and women receive the same support? • What do you believe is the best solution for increasing food security? • Who/which actors can contribute to improved food security? • Who should receive technical and financial support in terms of food security?
<p>Inclusion</p>	<p>Policy process, awareness spreading, communication</p>	<ul style="list-style-type: none"> • How do you communicate with the people in your community? What are the best ways of reaching people? • How often do you have community meetings? • How do you spread awareness about community meetings? • What type of issues do you normally put on the agenda for community meetings? • Who decides which issues are supposed to be discussed? Who in the community contributes most usefully at such meetings? • How do you shape local agricultural policies? What are the stages? And who are involved?

Needs of
society

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