A Transformative Lens on Resilience

A Qualitative Case Study of Sociocultural Practices and Adaptation to Climate Change in Kaski, Nepal

Ann Kristin Schorre

Master Thesis
Department of Sociology and Human Geography

UNIVERSITY OF OSLO

25.5.2018

A Transformative Lens on Resilience

A Qualitative Case Study of Sociocultural Practices and Adaptation to Climate Change in Kaski, Nepal

Figure 1: Picture from Kaski, Nepal (Photo: Ann Kristin Schorre 2017)

2018

A Transformative Lens on Resilience

Ann Kristin Schorre

http://www.duo.uio.no/

Trykk: CopyCat, Nydalen

Abstract

This thesis explores the relationship between planned adaptation interventions and sociocultural practices in the mid-hills of Nepal. The ways in which sociocultural practices, connected to gender and caste, influence and are influenced by adaptation to climate change through Climate Smart Agriculture is explored through a transformative lens. By focusing on intersectionality in the case study a situated approach to livelihood resilience is investigated and complemented by a dynamic view of culture. The findings suggest that the implementation of Climate Smart Agriculture can open up the potential for transforming some social structures, yet it does not interact directly with others. The sociocultural practices connected to gender and caste are relevant in different situations, on different reasons and this has implications for the adaptation interventions.

Acknowledgements

I want to thank all the people I met in Nepal who generously gave their time to talk to me and teach me about farming and adaptation. Thank you for giving me insight into your everyday life. I also want to thank LI-BIRD and Bikash Paudel especially for helping me during my stay in Nepal.

I am also very thankful to Karen O'Brien and Milda Nordbø Rosenberg for your invaluable supervision, backing and feedback throughout the process of working on this thesis. Also, I want to thank the AdaptationCONNECTS-project and all the people connected to it, especially Gail Hochachka and Irmelin Gram-Hanssen for feedback and valuable discussions. I have learned and grown so much and I am very grateful to be a part of the group and able to connect my thesis to the amazing work you are all doing.

Thanks to the department of Sociology and Human Geography at the University of Oslo for supporting me financially, making it possible to conduct the fieldwork. Thank you for proofreading Susan Jackman.

I am also very grateful to my fellow students and friends for making these two years amazing. Lastly, I want to thank my family for always being there to support and motivate me.

I am grateful to you all, without your help and support, this thesis would not have been possible.

The findings, conclusions and interpretations expressed are my own, and I am responsible if there are any mistakes within the thesis.

Table of contents

Abbreviations and Acronyms:

CSA	Climate Smart Agriculture
FAO	Food and Agriculture Organization of the United Nations
FY	Fiscal Year
GESI	Gender Equity and Social Inclusion
GHG	Green house Gas
INDC	Intended National Determined Contribution, adaptation and mitigations target for the countries in light of the Paris Agreement
LI-BIRD	Local Initiatives for Biodiversity, Research and Development
M.A.S.L.	Meters above sea level
NGO	Non-Governmental Organisation
NSD	Norwegian Centre for Research Data
SAK	Sustainable Agriculture Kit
SLA	Sustainable Livelihood Approach
SES	Socio-Ecological System
UN	The United Nations
UNFCCC	United Nations Convention on Climate Change
VDC	Village Development Committee
WB	World Bank
WCC	Ward Coordination Committee

Nepali words and concepts:

Ama Soumah	Mother group, informal social organization for women in a hamlet
Asi	Tool/Knife to cut grass
Bari land	Up-land, closer to the house, rain-fed.
Dako namlo	Basket and a carrying band to use around the head
Dalit	Group of people traditionally considered “low-caste” and “untouchable” by people belonging to higher castes
Ghee	A Nepali butter
Huri	Labour exchange system
Janajati	Ethnic or indigenous groups of people
Khet land	Down-land, urther away from the house, irrigated
Kulo	Irrigation system for the Khet land.
Kodalo	Handheld traditional tool used when farming
Majdoori	Employed labour
Namto	Carrying strap
Pani	Water
Pariwar	Household
Parma	Labour exchange system
Pidi	Area under a roof, directly outside the house
Terai	The Southern lowland of Nepal, towards the Indian border
Tole	Cluster of houses, referred to as hamlets in this thesis

List of figures:

Preface

Imagine being inside, hearing the rain hammering on the tin roof so loud that it is almost impossible to hear your own thoughts. It is the middle of the night and there are no electric lights outside to help see, but lightning flashes across the sky and lights everything up. The noise is so loud that it is not possible to sleep, so your thoughts wander off to think about the paradox of rain. Life is dependent on it, whether to drink, to support our daily activities, or for crops to grow and livestock to survive. At the same time, rain can destroy and kill both crop and livestock if there is too much or too little of it. Even though farmers have always adapted to weather, global climate change poses a new kind of threat and at a different scale than before. The earth is our basis for life, we are dependent upon it and a part of it.

These are thoughts I had one rainy night in a village in Nepal, when I was conducting fieldwork for this thesis. Even though the weather was frightening, the monsoon-season was just around the corner and the farmers depend on the rain for their crops. After I returned from my fieldwork I read in the newspapers about a devastating flood in another part of the country, that took human lives and destroyed food crops (Kathmandu Post, 2017). This thesis is a part of telling a narrative about humans, about a changing environment and how we shape the future.

The thesis aims to combine the strengths of a resilience perspective with theory concerning the construction of culture and subjectivities to shed light on adaptation in a socioecological system. This thesis is written in connection with the AdaptationCONNECTS-project that investigates the hypothesis that "successful adaptation occurs through processes of transformation" and with the overarching aim of "develop new understandings of whether and how different types of transformations can contribute to successful adaptation" (O'Brien 2015, p. 2). With the goal of contributing to this research, this thesis is, as far as I know, the first empirical case study that operationalizes the three spheres of transformation in the context of a developing country.

1 Introduction

> "Adaptation is a way of coping with the changes, both the social, environmental and the economical".
>
> (Informant 1, NGO)

Nepal is a country considered highly vulnerable to climate change and adaptation to future climatic impact is important (Ministry of Population and Environment 2016, p.1). In a country with great social diversity which traditionally has been connected to the hierarchical caste-system and with men being more privileged than women, the local context is important to take into consideration in terms of adaptation to climate change (Onta & Resurreccion 2011). This thesis explores how planned adaptation innovations interact with the local sociocultural context and the consequences for farmers. More specifically, through a case study in Nepal, I explore the relationship between sociocultural practices connected to different social identities and how these interact with Climate Smart Agriculture interventions. This thesis seeks to add to the "social turn" within climate change adaptation literature (Brown 2014, Shah, Angeles & Harris 2017). Research has shown that rural women and men are not equally affected and have different capacities to respond to climate change (Bee 2016, Huyer 2016). It has also been highlighted that there is a need to do research on the gender dimension connected to Climate Smart Agriculture (Huyer 2016, Steenwerth et al. 2014). The concept of intersectionality is a perspective that can contribute to a more nuanced representation. This is in line with current feminist research and its focus on intersecting social identities, such as gender and caste in the Nepali case (Djoudi et al. 2016, Jost et al. 2016, Thompson-Hall, Carr, & Pascual 2016).

1.1 Climate change, agriculture and adaptation:

It is widely accepted that the climate is changing and that humanity is contributing to this change (IPCC 2014, p. 2). This fact has given rise to the suggestion that we have entered a new geological epoch, going from the Holocene to what is now proposed as the Anthropocene (Dalby 2016). This epoch is characterised by human activity as one of the major forces affecting the environment, where we are pushing what Rockström et al. (2009) has termed "planetary boundaries for a safe operating space for humanity." The international community

has pledged through the Paris Agreement to try to limit global warming to below 2°C, aiming for 1.5°C (UNFCCC 2015, p. 3). This goal is ambitious and requires significant and rapid reductions in human emissions of greenhouse gases (GHG).

As a primary sector, agriculture is highly vulnerable to climate change and so are the farmers dependent on it (FAO 2017). There are different scenarios considering future temperature increases, which will lead to different impacts of climate change. Regardless of the impossibility of projecting the future, it is already clear that there is a strong call for the agricultural sector to adapt to current and future climate change (IPCC 2014). At the same time, agricultural activities and changes in land use are responsible for about 24 percent of GHG emissions, which points to the sector's important role in relation to mitigation (IPCC 2014, p. 47). A focus on small scale farmers is important since 98 percent of all farms globally are family run farms (Martinez-Baron et al. 2018, p. 112). This thesis looks at an empirical example of an adaptation intervention through a Climate Smart Agriculture project in Nepal by doing a case study and seeks to contribute to what Taylor (2017, p. 2) terms "emerging, yet sparse academic literature on CSA".

1.1.1 Climate Smart Agriculture as adaptation

Climate Smart Agriculture (CSA) is an umbrella term that includes strategies aiming to change farming practices and agriculture in ways that integrate three pillars: a) mitigation, b) adaptation and c) food security (FAO n.d.). The concept was developed to get a better understanding of the interconnected relationship between agriculture and climate change, a relationship that shows the importance of promoting agricultural developments that are climate-resilient. The global food crisis in 2007-2008 turned attention towards the importance of food security for the world's poor and underscored the importance of including this when developing integrated policies. This provides a context for the threefold goal of CSA (Chandra, McNamara & Dargusch 2017). When describing the concept's origin, Taylor (2017) points to both the World Bank (WB) and the United Nations Food and Agriculture Organization (FAO) as two global institutions promoting and developing CSA. The WB used the term climate-smart for policies that targeted vulnerability, development and a financial transition to green growth while simultaneously limiting emissions. FAO formalized CSA as defined by its three pillars in 2010 and further developed it through the Climate Smart Agriculture Sourcebook in 2013. The term has been embraced globally since it was formally

developed in 2010 and it has been promoted by leading international organizations (Taylor 2015, Tissier & Grosclaude 2016). The strategies are diverse and the concept is developed with the intention of being flexible and able to fit into different local contexts (FAO, n.d.). Rosenstock et al. (2016, p. 11) writes that CSA does not consist of completely new practices, but it is rather framed as an integrated approach that contributes to the triple-win goal. They also highlight that it is important that the practices are culturally appropriate and context specific in both time and place, in order to be applied. Food and agriculture have social, economic, political and cultural aspects connected to them, but agriculture is ultimately a socio-ecological process. This means that despite human input and attempts to control it, food production is happening at the interaction between society and nature.

Chandra, McNamara & Dargusch's (2017) literature review of the concept of CSA from 2004-2016 shows that there were different definitions used in the literature and these definitions encompassed a variety of on-farm practices. For this reason the concept is critiqued because the triple-win framing creates a vague foundation for a common definition and criteria. Neufeldt et al. (2013) argue that the limited understanding of the interactions between the three pillars means that essentially all agricultural practices with some improvement will fit under the label of CSA. The lack of common criteria allows for diverse strategies to be promoted as CSA, although they may have very different outcomes and consequences. One concern is that the goal of food security is often connected to enhancing production of food, which can have a negative impact on the goal of adaptation, if increasing production is at the expense of maintaining flexibility within farming. Taylor's (2017, p. 9) arguments back this position and he also states that marginalized groups might not have the capacity to protect the role the agroecosystem plays for their society and can risk being ignored under the label of CSA. Other critics point out that the concept is nothing more than a rebranding of farming practices that do not necessarily address aspects connected to climate change (Chandra, McNamara & Dargusch 2017). To have increased resilience as the goal of adaptation is also questioned, as resilience at a national level does not guarantee that this is not at the expense of certain groups at the local level (Taylor 2017, p. 10).

Chandra, McNamara, & Dargusch (2017) highlights three key trends from research on CSA: a focus on developing countries, an emphasis on scientific/technical issues and a view of the concept as re-branding sustainable agricultural practices. Based on this, they point to several aspects that are important for future research, two of these being the local level and

social aspects such as gender. This thesis seeks to take these aspects into account while also responding to Thompson-Hall, Carr and Pascual's (2016) and Djoudi et al. (2016) emphasis on the importance of an intersectional approach to how different social identities need to be considered when working with rural adaptation.

1.2 The aim of the research and the research questions:

As stated above, CSA are strategies developed internationally and promoted by international institutions. A motivation for this case study is to see how CSA promoted internationally is implemented in a local, cultural context in Nepal. This thesis addresses the overarching question:

How can a transformative lens on resilience contribute to understanding climate change adaptation in farming communities?

The goal is to explore this relationship through a qualitative case study conducted in Kaski, Nepal. The overarching research question has been narrowed down and my intention is to investigate it in light of a focus on sociocultural practices connected to social identities, such as gender and caste. By employing what I term a *transformative lens*, I explore CSA innovations and sociocultural practices in a way that both take into account resilience theory and systemic-thinking, as well as the social construction of culture. I use the empirical data from the fieldwork at the case study site to explore the two questions:

a) *What is the relationship between sociocultural practices connected to gender and climate change adaptation and resilience?*

b) *What is the difference between sociocultural practices connected to caste and gender when adapting towards resilience?*

My hypothesis was that farmers that could be considered part of more vulnerable groups, like women and low-caste, would face challenges in implementing CSA because of cultural practices connected to their social identity. In particular, I wanted to see whether and how this

played a role when implementing adaptation interventions to enhance resilience. If it did play a role, I wanted to know more about how this played out. Since I did not have a clear idea what these practices would be, I decided to do an explorative, qualitative case study.

This approach contributes to the "social turn" within resilience theory (Brown 2014, Shah, Angeles & Harris 2017). I have chosen to focus on these aspects due to their relevance within the research field of adaptation and resilience, the research project I am connected with and the people working in the field in Nepal. Moreover, I believe it is crucial to study the human dimension, not only as a cause of climate change, but also in terms of the solutions which can move us towards a more sustainable future.

1.3 The structure of the thesis:

Chapter one has provided a background for the choice of the research field of adaptation to climate change in agrarian settings and the focus on gender and intersectionality. It has introduced the concept of CSA and the discussions it has raised as it has gained influence. Based on this, the research questions were presented, to explore the current knowledge gap in the literature on intersectionality and adaptation generally, and connected to CSA specifically.

Chapter two starts out by looking at the relationship between agriculture and climate change vulnerability in Nepal. The social context in Nepal is introduced, with extra emphasis on gender, caste and ethnicity, and the historical context. I end the chapter by pointing to some of the relevant literature on climate change adaptation in Nepal. Chapter two provides the contextual background for the study.

Chapter three introduces the theoretical framework and explains the perspective from which the data is approached and analysed. I start out by introducing how different perspectives matter and present an analytical framework that gives room to combine different theories on adaptation when investigating a case. I show how a situated resilience approach and the social constructivist theory of performativity can be viewed in connection and as offering two complementary perspectives. I also address debates regarding normative or descriptive approaches to studying change.

Chapter four explains how the information to answer the research questions has been gathered. It discusses the development of the research design and explains choices made along the way. It is inspired by feminist research traditions and I have emphasised reflections

concerning the knowledge this thesis seeks to contribute with and the approach for achieving this.

Chapter five starts out by describing some findings of sociocultural practices of gender related to farming from the case study area. I employ a transformative lens to explore how the sociocultural practices affect the adaptation intervention, as well as how the intervention creates room for changes in the sociocultural practices.

Chapter six shows some main findings on how caste, ethnicity and gender influence adaptation to climate change. The ways in which practices differ within farming, the hamlet and the market is explored in light of what this means for implementing adaptation interventions. With the help of a transformative lens, I look at the differences between the sociocultural practices identified for gender and for caste and consider some implications this can have for implementing adaptation interventions. I end by considering how the transformative lens can provide a more nuanced understanding of resilience.

Chapter seven shows how I have attempted answer to the research questions throughout the thesis. I consider the limits of a case study and situates my findings into the context of the broader literature in this field.

2 The Nepali context

In this chapter I outline relevant background information for the case study. I start out by looking at vulnerability in Nepal in connection to climate change and some agricultural trends within the country. Some of the numbers I have found concerning this differ in the details, but they provide the same overall view of the trends going on. Because differing social identities are an important aspect of this thesis, the role of gender, caste and ethnicity in Nepal is explored. Towards the end of the chapter the literature on climatic and social vulnerability is brought together as the backdrop for the current understanding on climate change adaptation in Nepal. It is within this field of literature the thesis aims to contribute.

2.1 Agriculture and climate change vulnerability in Nepal

Adaptation to climate change is often seen in context with the knowledge of how vulnerable one is to the impact. Vulnerability to climate change can be defined as "The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt." (IPCC 2014, p.128). The concept combines the physical exposure to climate change and the impact this has, as well as how successfully one is able to meet the challenges. This means that a natural disaster can affect a specified geographical area with the same physical impact, but that there can still be large variations in how actors are affected by it, due to them having different capacities to deal with the stressor (Adger 2006).

Nepal is considered a vulnerable country to the consequences of climate change (Ministry of Population and Environment 2016, p. 1). Just after my field visit, the monsoon season resulted in enormous floods in the eastern and southern parts of the country, causing deaths, displacements of many people and loss of yields and livestock (Kathmandu Post, 2017). While it is not possible to connect singular events to climate change, the event resonated with the description of Nepal as highly vulnerable to: "climate change, water-induced disasters and hydro-meteorological extreme events such as droughts, storms, floods, inundation, landslides, debris flow, soil erosion and avalanches." (Ministry of Population and Environment 2016, p. 1). The country is already facing climate related hazards and the

challenges are predicted to increase in the future (Ministry of Population and Environment 2016).

Nepal is a diverse country in many regards. The country can be divided into three regions based on topographical characteristics: a) the lowlands from about 60 masl. called *Terai*, in the southern areas towards the Indian border b) Mid-Hills and c) Mountains, reaching all the way up to the Himalayan mountains with the world's highest mountain Mount Everest at 8848 masl. (Yadav 2016, p. 35) This shows great diversity which is central to the local ecology and what types of climate are anticipated. Different scenarios at the national level show that the temperature can increase between 1.3-3.8°C by 2060 and trends show that temperatures are already rising in most of the country (Ministry of Population and Environment 2016, p. 1). Holmelin and Aase (2013 p. 1388) point to how the anticipated changes in rainfall patterns on a national basis can be experienced very differently locally, where different microclimates are causing uncertainty for local projections.

Nepal is considered a developing country and ranks 145 on the United Nations (UN) Human Development Index (HDI) (Ministry of Population and Environment 2016, p. 1). About 65 percent of the population is working within the agricultural sector (Bhattarai, Beilin, & Ford 2015, p. 124). The majority of the Nepalese population live in rural areas, however there is considerate migration from rural to urban areas and the urban population is growing (Yadav 2016). Paudel et al. (2014) look at how abandonment of agricultural land is a growing tendency in the mid-hills of Nepal, increasing local food insecurity. They point to out-migration for work in either cities or abroad as the main reason for this. Out of the 65 percent working within agriculture, 80 percent are women (Bhattarai, Beilin, & Ford 2015, p. 124). This can be seen in connection to out-migration. Yadav (2016, p. 35) points out that the population living outside of the country grew from 0.762 million in 2001 to 1.92 million in 2011, with 86,7 percent being male and 44.81 percent being between 15-25 years old. These numbers differ from Paudel et al. (2014, p. 12) who point to numbers from 2009 where four million Nepali youths were counted as working abroad and remittance contributing to 30 percent of the Gross Domestic Product (GDP). Even though it is difficult to get exact, updated numbers on this, both Paudel et al (2014) and Yadav (2016) point in the same direction of youth out-migration, especially by men, is a trend in Nepal. Based on the information above, farmers in Nepal can be considered a vulnerable group in face of climate change (Bhatta et al., 2015).

A non-climatic natural disaster that struck the country was the devastating earthquake that hit about 50 miles northwest of Kathmandu the 25th of April 2015. The earthquake affected approximately 8 million people, killing approximately 8 900 people and leaving 2.8 million people in need of humanitarian assistance (Mercy Corps 2018). Even though the earthquake affected the entire country at the national level, the physical impact at the local case study site was little. However, it shows the importance of considering stressors other than climate change alone.

2.2 Social vulnerability in Nepal

As mentioned above, the definition of vulnerability includes not only physical exposure to climate change, but also a social component (Adger 2006). In Nepal, gender, caste and ethnicity play an important role in social organisation. I was introduced to a twofold division between social position and material condition as a way of nuancing the understanding of who is considered vulnerable in Nepal (Informant 26, NGO). Material condition is often visible through quantitative measurements of material resources, such as livestock, property and the financial capital a household possesses. It can also be viewed as different combinations of natural, financial and physical capital (Thulstrup 2015). The social position in contrast, is connected to more qualitative aspects of their social status, social identities and practices associated with this.

2.2.1 The role of gender

Yadav (2016, p.45-46) characterises Nepal as a patriarchal society and historically the Nepali woman did not have independent status. This has gradually changed and there are now laws in place with the goal of making women more equal to men, but the historically uneven relationship is still visible. One example is the gap in literacy rates, where 75.1 percent male compared to only 57.4 percent female can read and write, or also that it is uncommon for women to own property (Yadav, 2016, p. 48). There is a recognition within vulnerability studies that women are often considered more vulnerable than men to climate change (Hackfort & Burchardt 2016, Huyer 2016). In Nepal, it is often the women who are left behind and need to take care of the agriculture since the majority of people out-migrating for work are men (Yadav 2016). A danger with including gender as a category in studies is the problem of reproducing an essentialist, homogenising narrative where women are portrayed

as victims of climate change (Hackfort & Burchardt 2016). To avoid representing women as one homogenous group, there have been calls for intersectional approaches to highlight how social identities interplay with one another (Djoudi et al. 2016, Hackfort & Burchardt 2016, Thompson-Hall et al. 2016). In Nepal, the social identity of gender can be considered in connection to the social identity of caste/ethnicity, both of which play an important role in the social organisation in the Nepali society.

2.2.2 Caste and ethnicity

Nepal is a sociocultural diverse country, and Yadav (2016, p. 36-38) shows the number of castes and ethnicities was 125 in the 2011 census. She points out that there is not a strict separation between caste and ethnicity in Nepal. I also experienced the concepts were used interchangeably in the field site[1]. The caste system stems from Hinduism, however ethnic groups referred to as Janajati, with for instance a Buddhist background, are still included in the system and follow the practices (Adhikari 1995, Subedi 2011). Pariyar and Lovett (2016 p. 135) describe the caste system as being both exclusive, in that you can only belong to one group, and exhaustive, in that everyone belongs to a group, with the status inherited at birth from the parents' status. It is not difficult in daily life to distinguish who is who, as this is in many instances indicated by surnames. I was even told that it can be recognized based on phenotypic characteristics. This social stratification is connected to different practices in daily life and connected to beliefs about purity/impurity which segregate people. Rai (2017, p. 115–117) writes that everyone in the Nepali society experiences being impure and untouchable at least once during their life for a period. He exemplifies how a family that has lost a member is untouchable while grieving, or how women are considered impure when menstruating. When one is regarded as impure, different practices are followed. One example is how women menstruating traditionally were not allowed to sleep in the house, but stayed outside on the *pidi*, with the animals or in "menstruation huts" (Nightingale 2011, Kathmandu post 2018). The practice is illegal and changing, but there are still occurrences of women that die in huts while having their period (Kathmandu post 2018). For the low caste groups of Dalits the notion of impurity is considered permanent and Rai (2017) identifies norms and practices connected to activities such as eating and drinking, both what one can consume and together

[1] Sometimes I refer to them collectively as castes, even though they are differently founded, since they all are placed within the hierarchical social system.

with whom as practices connected to caste groups. These examples indicate how sociocultural norms and practices are a way of making group identity visible.

Figure 2 is an illustration over the Nepali caste system. Without going into all the details of the figure, those considered high-caste are Brahmins, traditionally referred to as the priests, Chhetris, traditionally referred to as warriors, and High Caste Newari. Then there is a middle group where Janajati, the ethnic groups are placed and a third group of the low-castes earlier called the untouchable, now often referred to as Dalits. Also foreigners and religious minorities such as Muslims are included (World Bank 2006). The system was once based on occupations, but the boundaries are not as strict anymore (Informant 2, NGO).

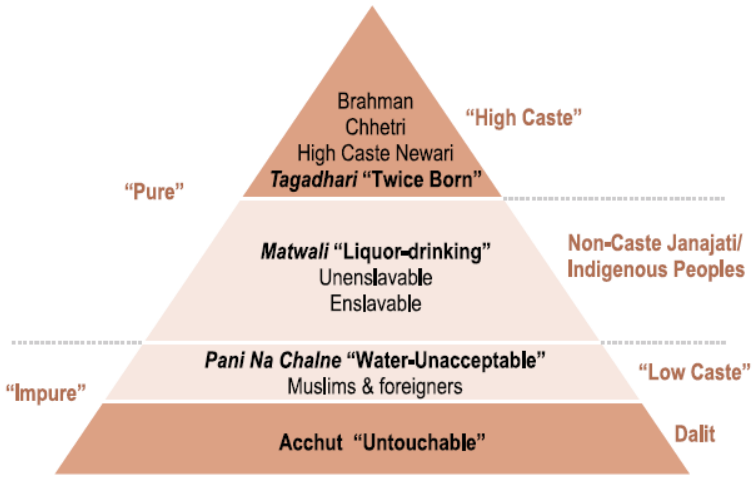

Figure 2: The Nepali Caste Pyramid according to the Muluki Ain of 1854 (Source: World Bank 2006, p. 8)

Still, during fieldwork I was told that this division, although correct for the national level, is more relative within specific areas. For instance, Gurungs are Janajati and placed lower within the traditional hierarchical frames of the caste system, but they are the majority in some of the areas around the mid-hills in the Kaski district. As a majority at the local level, they might have more power to set the agenda locally than those belonging to the higher castes (Informant 26, NGO). Bista (2004. P. xvii) describes the traditional segregation between the groups as: "…no feeling of being one nationality, one nation." and Whelpton (2005, pp. 156–157) uses a salad bowl to illustrate how the different groups are living together but often segregated socioeconomically, culturally, to some extend spatially, as well as through daily practises.

2.2.3 A historical perspective

The outline of some social systems that structure the Nepali society can appear static and essentialist. However, these structures have been challenged directly. The caste system has a

long history and in 1854 the discriminating structures of the Hindu caste system were institutionalised in Nepal and led to the marginalization of a large part of the population. In April 1990 began the first People's Movement of Nepal. This ended up establishing a monarchical multiparty democracy with its first election held in 1991 (Yadav 2016, p. 38-45). There was still unrest in the country and power remained under the control of elite groups from the high castes (Braithwaite 2015). In 1996 the People's War started. This led to a ten-year period with an unstable political situation, where more than 13000 people were killed, 1300 people disappeared and hundreds of thousands were displaced. In April 2006, political parties united in the second People's Movement in Nepal and after 19 days Nepal was declared a democratic republic (Yadav 2016, p. 44). Women's rights were central to the second People's Movement and it is estimated as much as 20 to 40 percent of the fighters were female. Also, the rights of other marginalised groups, such as Janajati and Dalit, were highlighted as important for the movement (Braithwaite 2015, p. 7). The country had its first female president elected in 2015 and there is an emphasis today on including women in governmental, non-governmental and civil-society organisations (Yadav 2016, p. 48).

2.3 Climate change adaptation in Nepal

There have been several studies on adaptation to climate change in Nepal. Nightingale (2017 p. 15) and Nightingale (2015 p. 223) points out that there are several policies in place for climate change, including the NAPA (National Adaptation Plan of Action), local policies developed in the LAPA (Local Adaptation Plan of Action) and CAPA (Community Adaptation Plan of Action). Nightingale (2017) further investigates how identity politics, in accordance with the complex social system in the country, is influencing the development of adaptation actions and implementation. Others have a more technical angle starting, studying the position of increased vulnerability due to the natural location and other variables measured in a quantitative manner and mapped out spatially (Mainali & Pricope, 2017).

Sapkota et al. (2016) shows through a case study in Nepal how people's social position influences their ability to anticipate and respond to climate change. One example related to caste is how the adaptation strategy of out-migration can be considered a coping strategy for Dalit families which does not contribute to improving their long term adaptive capacity, however, for families of the higher cstes, the same strategy can be seen as an investment in the future and a more long term adaptation strategy. They also refer to one

example concerning the role of gender. They consider illiteracy among some women as increasing their vulnerability, since this means that some women cannot read the label on the chemical pesticides they use in farming and some are unaware of the health risks associated with this. An important argument they raise is how people's current capacities and situations influence their future opportunities when dealing with change (Sapkota et al. 2016, p. 61). Nightingale (2017 p. 17) finds in her case study that implementation of adaptation measures locally can favour wealthier, high-caste landowners, rather than the most vulnerable. This is pointing to the same relationship as Sapkota et al. (2016), the point being that people's current position can be exaggerated positively or negatively by adaptation to climate change.

A case study in north-western Nepal shows how participatory climate change adaptation programs can contribute to further solidifying the existing hierarchies and power relations, rather than altering them. Nagoda and Nightingale (2017, p. 91) show empirically how local elites have a certain control over participation and that the marginalized groups seldom get to influence the programs. In this way, the programs which appear neutral and technocratic are rather contributing to stabilising the current power relations in the area. This is in line with Jones and Boyd's (2011, p. 1271) findings that there are social barriers for adaptation where caste is considered a "permanent nature" and that places restrictions on the choices for adaptation and decreases the household's flexibility.

Onta and Resurreccion (2011) have a different starting point when investigating the role of caste and gender for families adapting to climate change and the practical consequences in how adaptation is acted out. One example they mention is how one adaptation strategy was to engage in cross border-trade, but that the Dalits lacked resources to travel alone and this made them dependent on travelling with a person of higher caste. A barrier was identified and connected to the cultural norms of not sharing food and water between castes and this meant that the persons of lower caste would have to carry their own food. Onta and Resurreccion's (2011) study showed that gender roles also was important to pay attention to, because how people were adapting reinforced the existing gender roles. Common for these case studies is that they highlight the importance of social identities within climate change adaptation in Nepal. Several of them also highlight adaptive capacity as an important factor for increasing the farmers' resilience. Based on existing literature concerning the topic of vulnerability and adaptation in Nepal, I developed a hypothesis before leaving for fieldwork. I expected that social identities would affect the adaptation interventions in a

negative way, and that internationally-designed agricultural strategies would not be able to take the local hierarchical setting into account.

2.3.1 The NGO and Climate Smart Agriculture locally

The NGO I collaborated with is a national organisation with a history going back to 1995. They work in over 30 districts of Nepal and have a wide reach within the country (LI-BIRD 2016). There were two people working locally at an office in the centre-hamlet, one man and one woman. They both had lived in the village for some years and knew the people and the local dynamic.

In this case study I focus on Climate Smart Agriculture (CSA). However, the NGO had different projects running at the case study site and the separation between the different projects at the same site was not always clear to me as an outsider. From the NGO's perspective, the projects were separated by different measures, frameworks, indicators, contact persons in the central office and also funding and international partners. One other project being tested in the case study area was focusing on Sustainable Agriculture Kits (SAK) and introduced by the same NGO. The projects had different focus areas on the interventions tested, i.e. adaptation to climate change in CSA and reducing female drudgery in SAK. This difference in focus can have contributed to the synergy effects and how gender was clearly taken into consideration in the CSA project. At the NGO village office, the same staff was working on the different projects, in terms of implementation and interaction with the local farmers. They separated the projects when reporting, in the statistics and formally. For the farmers the distinction between the changes they made and how they were connected to the different projects appeared less clear. The fact that the boundaries around CSA within the village was less clear was something that worried me at first. It was difficult separating clearly what was termed CSA or not. However, with time this turned out to be a strength. To see the different projects in connection with one another and use the information to see synergistic effects from their interplay and how the projects can be complementary gave a more holistic and robust understanding of the interventions tested. The innovations I refer to within this thesis were listed as tested under the CSA-project, but they were also seen in connection to the other projects (Bhatta et al. 2016).This is also visible in the analysis, where some interventions that might not initially appear as climate smart still turn out to enhance the resilience of the farmers.

I was told that the CSA-project was developed top-down, but the design of the implementation process left room for flexibility and experimentation. Based on literature reviews there were first identified 147 possible CSA technologies and practices and from those 31 out of 49 were termed suitable for the mid-hill agro-ecological zone (Bhatta et al. 2016). After this selection it was narrowed down further by connecting with locals to see what they considered as suitable for their area which would meet their needs. One simple way of dividing up the innovations would be to separate between a) new knowledge and ways of doing things and b) new tools, technologies and materials. Because of the diversity and flexibility in the piloting, there were a wide range of different innovations tested out. The commitment of the NGO of working along a continuum between development and research was clearly visible at the local site. They kept track of the piloting and showed me how they compared, for example two different fields, one cropping in the traditional manner and one with intercropping. Then they would measure and compare the yields from the two different fields. In this way, the farmers were empowered by seeing the difference themselves and making informed choices when choosing what to plant.

The innovations presented in this thesis are not an exhaustive overview over all the innovations tested and piloted as CSA. I rather give a brief presentation of some of the technologies and highlight a few selected ones that were often addressed in interviews and that I see in connection to sociocultural practices.

2.4 Summary

Nepal is a country considered highly vulnerable to current and anticipated climate changes, both geographically as well as differentiated internally due to social stratification. It is a country with a lot of diversity geographically, climatically, socially and culturally. The farmers depend on agriculture, which is a sector vulnerable to changes in the climate. At the same time, the farmers may also face other challenges than climate change, for instance a lower position due to caste or gender. Several studies indicate the importance of including existing power relations and social positions when investigating climate change adaptation. CSA strategies are one way of adapting to climate change, and a focus for this thesis.

3 Theoretical framework

The topic of this thesis falls within a crosscutting field of literature where climate change adaptation, mitigation, development, political ecology and technology and science studies are just some examples of strands of literature that could provide fertile perspectives for exploring the case. How you understand a problem and which perspective you choose to study it from creates the foundation for the answers you will find and the solutions you apply to solve it. Geels (2009) exemplifies this by using one case study to show how five different theories provide different explanations for the same change, without any of them being incorrect. The theoretical approach of this thesis is to employ a transformative lens on resilience. As I will show, this approach provides a space where it is possible to engage with both a systems theory of resilience together with a social constructivist theory focusing on practices. Rather than argue that one is more correct or "true" than the other, the analysis shows that these theories can be used to highlight different aspects of the same change process and in this way complement each other.

The two theories outlined below have different foundations, one based on a systemic understanding and one in line with a social constructivist understanding of the world. What this thesis looks at are how socially constructed culture plays out through practices and when adapting, as structures that shape people's daily lives. Geels (2009) distinguishes between four ways of looking at meta-theoretical positions and argues that inter ontology crossover, as a way of studying the interactions and bridging them can be a fruitful way of approaching research. This can be done in different ways, either by going back and forth between the different meta-theories and comparing their strengths and weaknesses or by separating their use either in time or in space. In this thesis, I use *the three spheres of transformation* (O'Brien & Sygna 2013), as a lens for exploring different aspects of social change and to bridge strengths from the two theories of resilience and social constructivism. I end the chapter by presenting figure five where I summarize the analytical framework described in this chapter.

3.1 The Three Spheres of Transformation

Throughout the research process, *the three spheres of transformation* has been used as an analytical framework and tool guiding the development of the research project, the data collection, theory development and writing of the thesis. The three spheres provide a way of thinking about change processes in a holistic way that integrates different theories (O'Brien 2018, p. 155). The spheres can be used to shed light on how a change process is embedded in three nested circles as shown in Figure 3. The three spheres include a) the practical sphere, b) the political sphere and c) the personal sphere. The framework was developed in connection to studying social deliberate *transformation* in light of climate change, which can be achieved if all three spheres have the conditions necessary for transformation (O'Brien & Sygna 2013, O'Brien 2018). In this thesis, the three spheres are used to explore a transformative perspective on the CSA project, and to see how the spheres interact. I therefore start with sketching them out and putting them in connection with my research-project.

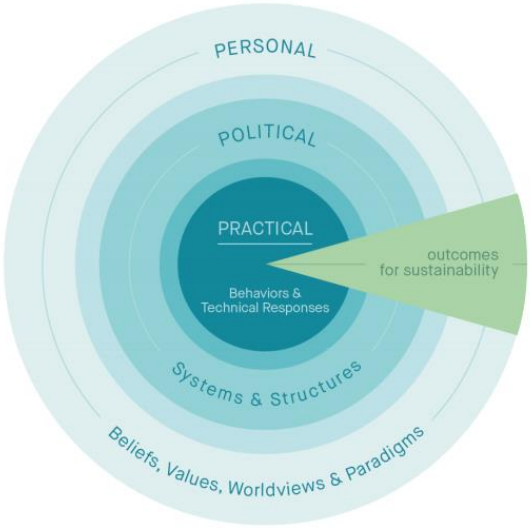

Figure 3: The three spheres of transformation. (Source: O'Brien and Sygna 2013)

3.1.1 The practical sphere

The practical sphere highlights the dimension of change that is often technical and behavioral and forms the basis for practical solutions. Examples are changing sowing practices, new agricultural tools, and other techniques and technical innovations. Changes in this sphere are possible to measure or visible through indicators. Typically, this sphere gets the most attention when discussing concerns of climate change adaptation as the outcomes can readily be measured and accessed using familiar measurement tools (O'Brien & Sygna 2013, O'Brien

2018, O'Brien et al. 2018). For the case study explored in this thesis, the practical sphere highlights the CSA innovations that are introduced and implemented at the case study site. Some examples from the case study are tools, new techniques like intercropping or new materials like a plastic pond. It is possible to measure how much water is saved, if there are financial gains or more food produced. As mentioned above, such quantitative measurements are important for testing and keeping statistics over how the innovations worked. However, the focus of this thesis is on the interaction of the interventions with sociocultural practices related to social identities, which can be studied by looking at how the practical sphere interacts with the political and personal spheres.

3.1.2 The political sphere

The political sphere draws attention to the systems and structures in which the practical changes are embedded. The systems that we are surrounded by, such as infrastructure, political systems or the economic system provide both limitations as well as possibilities for change in the practical sphere (O'Brien & Sygna, 2013, O'Brien 2018, O'Brien et al. 2018). In this thesis, the focus is on socially constructed structures that influence sociocultural practices connected to different identities. What is considered "normal" behaviour, as explained through Berger and Luckmann's (1967) theory below, guides human actions, both consciously and unconsciously. This is not to say that the social structures are deterministic when it comes to actions, but that it is important to recognize the mutual influence between structure and agency (Berger & Luckmann 1967). These structures can again be considered mutually constitutive of how systems function. As an example, the economic system is not designed by one person alone, but it structures possibilities for what is considered "normal" behaviour and actions. In the same way, there are certain sociocultural practices that are considered more "normal" than others through shared knowledge in a society (Berger and Luckmann 1967). Sociocultural norms that influence interaction within social systems, such as a household, a hamlet or in the market will be investigated in the analysis.

3.1.3 The personal sphere

The last sphere, the personal sphere, is depicted as the outermost circle. Examples in this sphere are individual and collective beliefs, values, worldviews and paradigms. The elements located in the personal sphere frame what is considered or believed possible to change as well

as how it can be changed. This sphere has received the least attention in the field of climate change adaptation and in-depth research into how the personal sphere influences the other spheres is needed (O'Brien 2018). The sociocultural norms in the political sphere, that can be played out as practices in the practical sphere are founded on different beliefs, religions, worldviews and values which are important to understand as they have consequences for adaptation (O'Brien & Sygna, 2013, O'Brien 2018, O'Brien et al. 2018). By focusing on how identities are socially constructed and performed through practices, I explore through a transformative lens how the practiced innovations can be understood to either reproduce the existing social structures or challenge them.

3.2 Theories of Climate Change Adaptation

As mentioned above, the analytical framework of the three spheres of transformation does not in itself provide a theoretical basis, but rather seeks to integrate various theories that relate to different spheres. To provide a theoretical basis for analyzing adaptation through the three spheres of transformation, I introduce resilience theory. I discuss critiques from the social sciences and how intersectionality may be a way of situating the approach in "the social world". This further directs attention to social constructivism and the performativity of sociocultural practices. The chapter ends with reflections concerning how change is approached normatively or descriptively. However, I start out by showing how the three pillars of CSA can be understood and approached together, rather than three separate goals. This calls for a broader interpretation of the concept of adaptation.

3.2.1 A broader understanding of adaptation

Within the climate change literature mitigation and adaptation are seen as two different, but complimentary responses to climate change (IPCC, 2014). Mitigation is a response that aims at reducing emissions of GHGs to limit climate change itself, while adaptation is defined as:

> "The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects" (IPCC 2014, p. 118).

Adaptation as a response to climate change is based on the understanding that we will not be able to mitigate enough and that there will be a need to adjust to be better prepared for changes that are imminent. Adaptation is important because of the understanding that the climatic system poses an external threat to the social system, and the social system needs to adapt to the anticipated threat. Bassett and Fogelman (2013) trace the concept of adaptation to Darwinist evolutionary theory within biology. This theory explains how species adapt to their surroundings through time by the process of natural selection. The individual best fitted in the external environment will have the best chance to survive and reproduce. In this way, characteristics from individuals best adapted to the environment will be transmitted and developed over time. Head (2010) points out how the concept has a long history within cultural ecology and asks whether adaptation within climate change is just "retrofitting a concept." She argues that there is a need to avoid portraying the environment and culture as dichotomies affecting each other and highlights the need for a dynamic understanding of culture. The three spheres of transformation provides room to address this need, which I show in the analysis.

Pelling (2011) argues that the division between adaptation and mitigation is challenging and suggests a possible definition of adaptation as: "a response to a perceived risk or opportunity" (2011, p. 20). In this thesis, adaptation is defined in line with Pelling's (2011) broader definition of different responses to risks and opportunities posed by humans. This understanding of adaptation can be seen to encompass all three pillars of CSA. Mitigation (limiting emissions from farming), adaptation (as adjusting to a changing physical environment) and ensuring food security. These can be included under the broader goal of responses to a perceived risk.

Even though I use a broader definition of adaptation, including change processes of adjusting by implementing CSA through the three pillars, I want to point out IPCCs' further differentiation between a) autonomous adaptation (which is not conscious or planned) b) planned adaptation (as a deliberate decision) and c) anticipatory adaptation (to expected future changes) (IPCC 2007). This thesis focuses on a CSA project that resonates with planned adaptation to climate change, while it is developed as a pilot-project to test CSA innovations.

Eriksen et al. (2011) points out that adaptation is not always positive, and that there can be trade-offs where adaptation at one place is at the expense of adaptation somewhere else. To avoid this, they introduce principles to achieve sustainable adaptation, where the

context of vulnerability and importance of understanding different challenges to avoid unintended consequences is one of the points highlighted as important to take into consideration. A theory that is recognized for understanding adaptation to climate change and provides room to investigate unintended consequences is resilience.

3.3 Resilience in coupled socioecological systems

Imagine you are on a boat, the weather is nice and there are no waves. You have a full glass of water that you want to carry from one side of the boat over to the other. To avoid spilling you adopt a strategy of walking slowly, focusing on the water in the glass. Imagine doing the same task in a different scenario where there are large waves and the boat is moving in unpredictable ways. In this latter case, you would need to adopt a different strategy, plan for uncertainty, be flexible and adjust to the waves that rock your balance.

Walker and Salt (2006, p. X) uses the metaphor described above to introduce the concept of resilience as a strategy when adapting to future changes that we cannot predict. An important distinction is made between *engineering resilience* and *ecosystem resilience* as two different ways of using the concept. Engineering resilience concerns how fast a system returns to its equilibrium state after a shock and is often used in relation to mechanical systems. Ecosystem resilience is rather defined as: "the magnitude of disturbance that can be absorbed before the system changes its structure by changing the variables and processes that control behavior" (Holling & Gunderson 2002, p. 27-28). The latter understanding of resilience is important for creating sustainable relationships between nature and society. This is because it emphasizes adaptiveness, unpredictability and variability as strategies to meet unknown challenges, rather than the notion from engineering resilience of controlling or managing the change and the speed of it (Holling & Gunderson 2002, Walker & Salt, 2006). Ecosystem resilience can therefore be understood as the flexibility of a system to meet unpredictable changes without changing its own structures fundamentally.

Below I outlining some core concepts of resilience theory, which provide the foundation to understand the background for why a "social turn" has been called for (see Brown 2014). Resilience is referred to as a research approach, a theory of change and a concept. I will consider these in connection to each other below. Resilience thinking has been promoted and developed by interdisciplinary researchers to engage with complex challenges

like climate change. The approach is also used by practitioners and promoted through development organisations (Taylor 2017). The approach falls under a broader label of systems theories and focuses on the interplay between the different parts of a whole. When applying a systems perspective Flood (2010, p. 269) differentiates between a) systems thinking and b) systemic thinking. The former refers to systems that exists in the real world where it is possible to draw intuitive boundaries, like the human body, while the latter refers to a way of thinking. Resilience theorists study coupled socioecological systems and the idea behind it is the understanding that all social systems are dependent on, and embedded in, ecological systems and at the same time ecological systems are affected by humans. In this sense, socioecological systems affect each other mutually and should be studied in connection with each other (Resilience Alliance, n.d.-b). In this thesis, the resilience theory underpins a systemic thinking of the socioecological system at the case study site, with a focus on the social system.

Resilience- some core concepts

Some of the core concepts of resilience theory include *the adaptive cycle, the panarchy model, thresholds, adaptability and transformability.* The *adaptive cycle* is illustrated through a model consisting of a front-loop and a back-loop showing two transitions. The front-loop of the cycle shows how resources are used within a system and how longer periods of stability can be followed by a shorter period (depicted by the back loop) where there are opportunities for internal change, reorganization and innovation (Holling & Gunderson 2002, Resilience Alliance n.d.-a, Walker & Salt 2006). The theory of the adaptive cycle is meant to be used as a metaphor that highlights some important dimensions of change and adaptation, rather than a strict theory of how the world works (Holling & Gunderson 2002, Resilience Alliance n.d.-a). Dugmore et al. (2010) use the adaptive cycle to explain a historical case of the collapse of the Norse Greenland settlement over a timespan of several hundred years. Even though the communities could be considered to be adapting to the local stressors, their analysis shows that local adaptation led to reduction of the long term resilience and eventual collapse. In this thesis the adaptive cycle is a theoretical basis for understanding the importance of remaining flexible in order to stay resilient and avoid collapse.

A second related concept is the *panarchy model*. This part of resilience theory highlights the interconnectedness of systems across scales, by showing how systems and

adaptive cycles are influencing and influenced by other systems above and below. An example of social systems is how the individual is embedded within a household-system, within a local community, within a nation, within a region and within the international community. Interactions at one scale influence and are influenced by cross-scale interactions from sub-systems and the broader system themselves are embedded within (Walker & Salt, 2006, Holling, Gunderson & Peterson 2002). One of the criticisms that resilience thinking has met within climate change adaptation literature is an understanding that resilience implies resistance to change and favours maintaining status quo (Pelling 2011). The cross-scale interactions explained through the panarchy-model is crucial for understanding the balance between change and persistence. Through connected systems, the panarchy-model provides room to understand how transformation on one scale can contribute to resilience on another scale (Folke et al. 2010). To explore this argument, the concepts of thresholds, adaptability and transformability are important.

Thresholds within resilience theory refer to the division between two different regimes of a system and can be illustrated with the metaphor of a ball in a basin. The bottom of the basin is the equilibrium of the system, which the ball (the state of the system) is gravitating towards. However, the shape of the basin is not constant, but changes form due to the conditions surrounding the system. The system's resilience is described by how much the basin can change without the ball flipping out of the basin and into a different regime, i.e. crossing a threshold (Walker & Salt 2006). More accurately, Walker et al. (2004, s. 2-3) distinguish between four aspects of the system's ability to stay within the basin. This highlights how measuring resilience of a system is a complex task. Both Walker et al. (2004) and Walker and Salt (2006) focus on the ecological state variables when exploring resilience and humans appear as a homogenous group both affected and affecting the environment. In this thesis I focus on the social system and use the concepts of thresholds and panarchy more metaphorically to investigate the resilience of a human system at the hamlet, household and individual scale by exploring the farmers adaptive capacity[2]. This will be explored through the use of five different capitals (Thulstrup 2015), explained below.

[2] Adaptability and adaptive capacity can be used interchangeably (Folke et al. 2010).

3.3.1 Adaptive capacity, flexibility and livelihood resilience

Ecosystem resilience was defined above as the flexibility of a system to meet unforeseen changes without changing its own structures fundamentally. The *adaptive capacity* of the system can be defined as: "The set of resources and the ability to employ those resources that are prerequisites to adaptation" (Nelson, Adger & Brown 2007, p. 402). Adaptive capacity is an integral part of resilience. Tanner et al. (2015, p. 23) highlight that since resilience stems from ecology, there is a risk of losing sight of the human aspect within these systems and the normative dimensions associated with this. They point out how resilience can be understood as a "boundary object" to investigate different kinds of shocks and stresses to a system, whether it is food security, climate change or other natural disasters. They define livelihood resilience as: "The capacity of all people across generations to sustain and improve their livelihoods opportunities and well-being despite environmental, social and political disturbances" (Tanner et al. 2015, p. 23).

The future to which we are adapting is impossible to predict. Flexibility is a way of building up resilience by increasing important assets, which offers a way of approaching adaptation to changing conditions. By studying how the farmer's capitals and assets are affected and affecting the adaptation measures, important dimensions of the farmers resilience can be investigated (Thulstrup 2015). Thulstrup (2015, p.353) define resilience as: "Resilience is understood here as a measure of the level of access to endowments of capital – financial, natural, physical, social, and human – that can be mobilized in order to respond and adapt to environmental change." This is the definition of resilience employed in this thesis and which are used for investigating the resilience for the farmers at the case study site.

Exactly how these assets interact and which ones are most important would then differ within different contexts and dependent upon what type of shock that occurs. The assets-based approach was originally used in Sustainable Livelihood Approach (SLA) in development approaches exploring internal interaction in systems through concepts of different capitals (Scoones, 2009). This thesis aims, however, not to give a complete livelihood assessment, but instead to explore the relationship between sociocultural practices and resilience by focusing on five capitals and how they interact (for a complete checklist on sustainable livelihoods assessment see Scoones (2009, p. 177)). I am inspired by Thulstrup's (2015, p. 356) way of combining the sustainable livelihoods approach with resilience, and build on his interpretation the five capitals and interpreting them in light of my case study.

The five capitals are 1) financial capital (which refers to economic resources) 2) physical capital (which refers to infrastructure, technology) 3) natural capital (which refers to land and natural resources) 4) human capital (which refers to labour force) and 5) social capital (which refers to social networks, group-membership and social status) (see Thulstrup 2015). This is a further differentiation from the twofold division between social position and material condition introduced earlier. Implicit in this way of approaching resilience is an understanding that increasing the different assets also leads to increased resilience.

While adaptive capacity describes the ability of actors to influence the systems resilience, stay within the thresholds, and maintain the regime, *transformability* refers to the capacity to deliberately shift the system into a new regime and create a new system. Following the ball-in-the-basin metaphor, transformability is connected to the capabilities needed to deliberately get the ball into a new basin, with a new attractor-field (Folke et al. 2010, P. Olsson, Galaz, & Boonstra 2014, Walker et al. 2004). Folke et al. (2010) use the example of how there was a change in agrarian practices in several Latin American countries, going from unsustainable land management to experimenting with new low-till alternatives. Over time the new farming practices were implemented on a larger scale which Folke et al. (2010) term a socioecological transformation. They highlight this as an example of how transformation in a system at a lower level within the Panarchy-model can contribute to resilience at a higher-level.

Figure 4: The five different capitals of livelihood resilience (Source: Thulstrup 2015, p. 356, adjusted by author)

Capital:	**Describing:**
Natural capital	Land areas and natural resources
Physical capital	Infrastructure, technology, materials, access to water
Financial capital	Economic resources
Human capital	Labour force
Social capital	Social networks, group-membership and social status

Social science critiques of resilience

Brown (2014 p. 107) demonstrates that the term resilience has gained enormous popularity within the discourses on the global environment. The popularity of the concept has

also led to several critiques of the way it is used and I will highlight some of them below. The first point is the need to ask the question of "resilience of what and for whom?" when the concept is extended into the social realm (Brown 2014, p. 109, Cote & Nightingale 2012, p. 475, Gillard et al. 2016). This is not a natural given and social research shows in many instances how resilience for some can be at the cost of the resilience of others, as some of the examples of identity politics and climate change adaptation in Nepal show (Nagoda & Nightingale 2017, Nightingale 2017, Onta & Resurreccion 2011). These examples also direct attention to a second and related weakness that resilience is often critiqued for, which is its lack of attention to power relations and politics within the social system and how it affects the Socioecological System (SES) (Cote & Nightingale 2012).

Third, there is a scepticism towards the use of systems within social sciences (Gillard et al. 2016, Olsson et al. 2015). This can be related to difficulties as to where to draw the boundaries of the system. Even though the socioecological systems are regarded as coupled, the understanding is founded on a separation of the external environment as an exogenous force affecting the SES, and some argue that it is not paying sufficient attention to endogenous processes (Brown 2014, p. 109, Olsson et al. 2015). Taylor (2015) offer an alternative approach to climate change adaptation where the environment and society are not seen as two separate systems, but rather coproduced. I will delve further into this below. Gillard et al. (2016, p. 256) offers a fourth critique by arguing that the resilience approach seems to promote an understanding with a management focus where it is assumed that resilience in the short run will lead to successful adaptation in the long run. From this perspective, it represents a deterministic way of approaching the future. This is an important point and Eriksen and Brown (2011, p. 3) point out that there is limited knowledge on the long-term consequences of adaptation itself and whether it actually contributes to increased environmental and social sustainability. This critique is not limited to resilience as adaptation, but very relevant and important to be aware of when implementing adaptation measures aiming for resilience.

Although the inclusive concept of socioecological systems is a strength within resilience thinking, Westley et al. (2002) point out that there are some important differences separating ecological and social systems. People in social systems have developed systems of symbolic construction, for instance through language. The fact that we can communicate abstraction through our language and transfer knowledge adds an important dimension to time

and place, which are the two most important aspects of ecological systems. Humans can reflect upon issues and change the structures in the system intentionally and at different speeds than what happens in ecological systems. We even have the ability to make future scenarios and change behavior in accordance with expectations of future gains. What Westley et al. (2002) point to here, is how the social construction of society is an element within social systems, which differentiates them from ecological systems.

3.4 Social construction of society

Berger and Luckmann (1967) outline a theory of how society and culture can be seen as social constructions. This is described as a process where there is room for change and alterations in the production and reproduction of the structures. They distinguish three processes that interact in the dualistic relationship between structures and agency to the degree that the structures in some instances can function as an objective reality separated from the individuals. Humans create or produce practices for how things are done as a way of organizing society and social interactions. When these practices are acted out, they become externalized.

Berger and Luckmann (1967) distinguish between society as an objective reality and as a subjective reality. Over time these practices becomes habits of how things are usually done, or even norms concerning how things should be done in a collective group of people. When it becomes a part of the collective practice and norm it can be considered a part of the objective reality, which is outside the realm of what a single individual can change and appears instead as a structure that people form their lives in accordance to. When people are following these structures, they are simultaneously reproducing and legitimizing them. If the norms and practices are not questioned they can be internalized so they appear natural and as a part of how the world is, i.e. they become a part of the subjective reality. The structures appear natural, as a way the world works and are considered a part of the actor's knowledge, assumptions and beliefs about how the world works when it is not brought into question.

At the core of this theory is the duality of structure and agency; society and culture are produced by humans and human action is structured by society. Awareness of these structures, by making them an "object" again, can give room for contestation and space for change. Social structures create expectations for certain types of behavior by restricting some

actions and at the same time enabling and naturalizing actions in line with the structures which are considered "normal behavior" (Hodgson 2006, p. 2). This was something I as a foreigner, experienced during fieldwork myself several times:

> "Since I wore sandals that were not made out of leather I could use them in the Buddhist temple, but in the Hindu temple I had to take them off. I also had to do different movements with my hand to touch my forehead and chest to show respect."
>
> (Field notes translated from Norwegian)

As an outsider, I did not know of these norms, but by others telling me what was going on-socially transferring the norm through language, I was able to follow them and not break the social expectations.

3.4.1 Situating resilience by focusing on social identities

Cote and Nightingale (2012) highlight the need to situate the resilience approach and some researchers are working on this already (Shah, Angeles & Harris 2017, Surtiari et al. 2017). This thesis aims to contribute to such research by highlighting cultural aspects interacting with adaptation interventions. IPCC (2012, p. 84) refers to culture as: "(…) a complexity of elements that can relate to a way of life, behavior, taste, ethnicity, ethics, values, beliefs, customs, ideas, institutions, art, and intellectual achievements that affect, are produced, or are shared by a particular society." This is a broad definition, so to narrow it down, I focus on practices connected to different social identities.

Identity is defined as: "Social categories which an individual claims membership as well as the personal meaning associated with these categories" (Shields 2008, p. 301). People hold multiple social identities and some examples are gender, age, sexual orientation, functionality, profession, race, ethnicity and caste. This is captured in the concept of intersectionality, which highlights how different aspects of an individual's identities interacts. Intersectionality shows how single-axis frameworks that focuses solely on gender such as second wave feminists, or class from the labour movement, or race from the antiracist movement, miss the interrelatedness that becomes visible when the aspects of different identities are studied in relationship to one another (Cho, Crenshaw & McCall 2013, Nightingale 2011, Shields 2008, Valentine 2007).

To include an intersectional perspective within resilience is to recognize that there are differences between certain social identity groups, and how the social identities act together to influence access to different assets and capitals. This thesis highlights the connection between the adaptation interventions and the sociocultural practices connected to social identities. Because an intersectional framework in itself could produce an unmanageable amount of data I focus on the sociocultural practices appearing in the intersection of the social identities of farmer-gender, farmer-caste/ethnicity and farmer-gender- caste/ethnicity and look at them in connection to selected CSA interventions that stood out in my empirical data material. This could be investigated quantitatively with an understanding of social identities as boxes to be ticked off.

A constructivist approach, however, offers a more dynamic view on social identities in line with Head's (2010) request to have a dynamic view of culture within climate change adaptation research. Butler (2003) is a feminist writer and her theory on the performativity of gender recognizes gender as something acted out and performed in daily activities following and reproducing norms and expectations. She argues that it is important not only to understand how gender is naturalized, but also how it can be challenged[3]. Butler argues that there is a:

> "…double truth that although we need norms in order to live, and to live well, to know in what direction to transform our social world, we are also constrained by norms in ways that sometimes do violence to us, and that, for reasons of social justice, we must oppose." (Butler, 2003, p. 3).

Valentine (2007) draws on this theory of practice and performativity and argues that intersectional analysis can start from the lived experience, looking at how identities are being acted out and how individuals give importance to different identities in different situations. An empirical case study of social transformation of gender identities and how they are practiced in Nepal is provided by Yadav's (2016) bottom-up perspective on social change in context of the Nepali war. The transformation is an effect of the conflict and she studies the intended and unintended spaces for empowering women. This is similar to the exploration of this thesis, where I explore how practical climate change adaptation interventions create space

[3] Butler (2004) is discussing the use of the category "women" in itself. I will however not go into this discussion, but limit my understanding to the more widely accepted position that gender is socially constructed and performed.

where structures related to gender, caste and ethnicity come in to play. This process can create both challenges and opportunities for change. Nightingale (2011) shows how there is a material aspect that plays a role in the formation of different identities such as gender, caste and class in Nepal. By looking at how practices related to the belief of purity/impurity and social identities play out spatially, she argues that the materiality is a part of forming the identities. Building on this way of understanding social identities produced and reproduced through interactions among social structures, materiality and human actions, I see adaptation as a way of producing our lived environments (Taylor 2015). In this way, I show how adapting by implementing CSA can make space for new ways of constructing social identities, by changing practices.

3.4.2 Lived environments and climate change adaptation

Taylor's (2015) way of understanding climate change adaptation can be seen in connection to the notion of social production. He critiques the dominant discourse of climate change where he calls vulnerability, resilience and adaptive capacity "the holy trinity of climate change adaptation" (Taylor 2015, p. 53). He argues that this understanding limits the way we approach the type of social change that is called for and lays the foundation for managerial and technocratic ways of approaching the challenge of adapting to climate change.

He writes:

> "…We must ask how our lived environments, in both their social and climatic dimensions, are actively produced through the complex interaction of human and non-human agencies in ways that are markedly unequal (…) Engaging contemporary climatic change is not about adapting to a changing external environment. It is about challenging how we produce ourselves." (Taylor 2015, p. 18–19)

Taylor uses the term "lived environments" to illustrate how the environment is a part of social and biophysical relational fields that are mutually reproducing one another and rather than talking about climate as "average weather" he focuses on what he terms material "climate" (Taylor 2015, p. 15–19). The meteorological forces can be felt and experienced in the socioecological field and this is what he calls material climate. This material climate is partly socially produced through how we live and reproduce ourselves. To understand climate change from this perspective he argues that: "Material climates are produced at various scales

within the complex combinations of meteorological forces, social energies and other non-human agencies inherent to the production of lived environments" (Taylor 2015, p. 40). One of his main arguments is that the dominant discourse on adaptation is based on a dichotomous understanding of society and climate, where societies must adapt to the external forces of climate change. To position this in relation to the resilience theory described above: the ball-in-the-basin metaphor does not investigate how the ball is co-creating and producing the basin itself. Taylor (2015) shifts the focus from adaptation to an external climate, over to how we reproduce ourselves and our lived environment with a material climate as a way of opening up a wide space for solutions, which is here employed in line with Berger and Luckmann's (1967) theory.

Reckwitz (2002) differentiates between four ideal-type theories that build on Berger and Luckmann's (1967) cultural theory, and he focuses on practice theory, which he understands Butler as belonging to. He writes: "for practice theory, social practices are bodily and mental routines" (Reckwitz 2002, p. 257) and that social order is dependent on how the focus of analysis is: "(…) produced by a nexus of (non-discursive and discursive) practices as body/knowledge/things-complexes" (Reckwitz 2002, p. 258). Shove (2010) argues for the use of practice theory to study more sustainable ways of living, but her examples are placed in a different economic context (flying or driving cars). However, the focus on practices and production provides an empowering foundation for approaching humanity's role in shaping our own future and is thus employed in this thesis.

Burningham and Cooper (1999) go through some of the main critiques of social constructivism within environmental discussions. They build on Sismondo's (1993) distinction between a mild and a radical constructivist approach. The mild constructivist approach, like the one introduced by Berger and Luckman (1967) argues that the "social reality is socially constructed" and does not reject an objective reality (Burningham & Cooper 1999, p. 303). Ontologically, this is not different from realist positions. On the other hand, Taylor (2015) might be considered to fall under what they term radical constructivism, where materiality can also be considered socially constructed, but Taylor (2015) adds to this by emphasizing that there is an interplay with non-human agencies. This thesis takes a mild constructivist approach, where an analytical framework helps connect the social construction of culture and interaction with materiality, with a realist position concerning power relations and effects of the socially constructed practices.

3.5 The three spheres of transformation and the role of culture

The framework of the three spheres highlights the importance of investigating all three spheres as interconnected in order to see what the possibilities and barriers for change and adaptation are and where they are located (O'Brien, 2018). O'Brien (2018, p. 156) writes: "Culture is a powerful subjective construction that influences human-environment relationships" and she considers it to be present in all three spheres. Figure 5 illustrates my understanding of how culture can be studied through social constructivism and practice-theory and how it is used in this thesis. Culture is rooted in the personal sphere where beliefs, worldviews, assumptions and values are identified. This provides the foundation for the production and reproduction of the social structures in the political sphere, such as norms connected to what is considered appropriate or "normal" behavior from certain social roles, such as caste, ethnicity or gender. In the practical sphere, this is visible through the specific ways of doing things or materials used and the meanings attached to them.

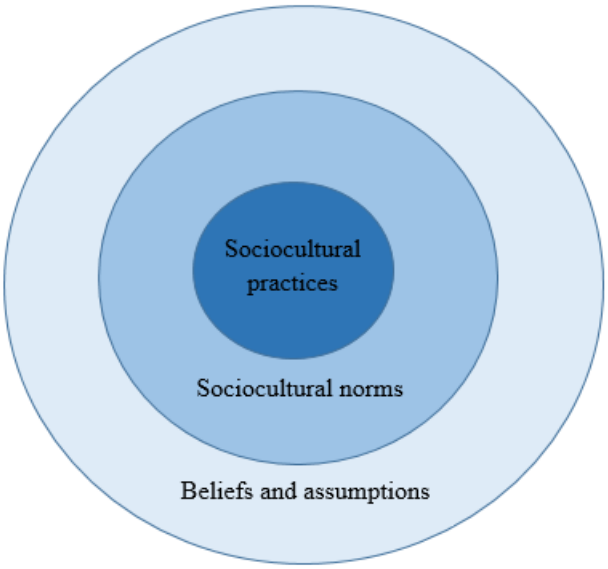

Figure 5: Culture and the three spheres of transformation (Source: O'Brien and Sygna 2013, adjusted by author)

In this thesis the three spheres have been used as a tool to integrate different perspectives on the implementation of CSA in a specific cultural context in a case study site in Nepal. These can be studied in the practical sphere as technical interventions to increase resilience of the socioecological systems in the political sphere. With a focus on the social system, I explore how sociocultural structures in the political sphere such as norms, influence practical adaptation interventions. The personal sphere highlights how the structures in the political sphere are socially constructed and embedded in assumptions and beliefs in the personal sphere. The interaction among the spheres provides the space for a nuanced understanding of possibilities and barriers for climate change adaptation (O'Brien 2018). An example is if a technical solution proposed in the practical sphere is not challenging the

beliefs or values in the personal sphere and in line with the systems or structures in the political sphere, the two outer spheres can support and enable the change implemented. A different technical solution may create opposition to an existing value system where one part will lose if the change is implemented, this might be seen as a power struggle in the political sphere where some win at the expense of others. In the latter case, the three spheres can reveal barriers to adaptation. This thesis takes the position that the social structures are real, but at the same time that they are reproduced through our actions and how we perform them, and because of this there is room created for alterations. I point to how this can be connected to their foundation in the personal sphere and that this influences the consequences they have on adaptation. The process of reproducing, challenging the norms or how the norms and practices can serve as barriers are thus used to investigate what can be termed a broader solution field for how to approach climate change adaptation.

The flexibility of the framework of three spheres of transformation is both a strength and a weakness. As it is not in itself a theory of change, it does not actually tell us anything about how change happens, what kind of change happens or what are desirable changes. The flexibility of the three spheres-framework can be considered both a challenge, as it provides the researcher with a great amount of space to define how they are used, as well as a strength, as it provides room for combining different perspectives on a challenge and tries to minimise the blind spots.

3.5.1 Studying change descriptively or prescriptively

Thorèn and Olsson (2017) points out how the concept of resilience can be used to study change descriptively or prescriptively. When the concept of resilience is used descriptively it says nothing about the characteristics of the system being either good or bad. However, when resilience is framed as the goal when adapting and formulating policy, there is a need to be cautious of how it is used. If a system is oppressive of marginalized groups, maintaining it and making it more resilience would be unethical (Cote & Nightingale 2012, Thorén & Olsson 2017). I would argue that the same goes for transformation. It can be used descriptively within research or prescriptively for policymaking or forward-looking research.

O'Brien et al. (2018) characterize the three spheres of transformation as a framework to understand important dimensions of *transformation* defined as "significant changes in form, structure and meaning-making" (O'Brien et al. 2018, p. 29) and cuts across all three

spheres of the model. It is important to note how this is only one of several ways that the concept transformation is used within climate change literature. Feola (2015) identifies eight different conceptualizations of the term in his literature review: there are some common aspects, in that they all address structural change, but there are significant variations between their uses as well. These differing views on the concept highlight the subjective dimension of characterizing what kind of change is occurring and the three spheres can help to explore this. For some actors changing the type of crop grown is termed a transformation, while the same action can be a minor adjustment for others.

When the three spheres are used as a tool for interpretation of empirical change processes it highlights the interaction among all three spheres, and how transformative processes are cutting across all three spheres. The name of the framework- three spheres of *transformation* can be a bit misleading because of the great diversity in the ways the concept of transformation is used within climate change literature. The framework can be used to study change-processes more in general, since all changes will be anchored in some way in the personal sphere, the political sphere, as well as in the practical sphere. The framework helps highlight these dimensions and whether they are changing or not. Based on this, I argue that the way in which this perspective is employed in this thesis offers a transformative lens on resilience, when discussing a situated resilience perspective in light of the three spheres.

Figure 6: Schematic overview of the analytical framework

Theory:	**Situated resilience in coupled socioecological systems**	**Social constructivism-Practice theory**
Society-Environment Relationship	Society-Environment as separate (but linked) systems	Society-Environment as mutually co-constituted and produced and reproduced through performances
Analytical categories employed in the thesis:	Five capitals: Financial, social, cultural, physical and natural capital intersecting with practices for social identities	The subjective and objective reality and processes behind: Reproducing the norms, challenging the norms or working as a barrier
Exploring:	The interaction of climate change adaptation innovations and the households adaptive capacity	How adaptation interventions play a part in how humans produce and reproduce themselves
Relationship to the three spheres:	The practical sphere interacting with the political sphere	The practical, political and personal spheres in connection

3.6 Summary

There are different ways of approaching the relationship between humans and nature in light of climate change. Adaptation can be understood in a narrow sense as adjusting to better fit the anticipated external changes or in a broader sense of describing the changes we make to meet climate change. The latter understanding can include adaptation, mitigation and food security. The three spheres of transformation provides an analytical framework to investigate changes from adaptation in a nuanced manner. I situate the approach of studying adaptation interventions aiming to enhance resilience with a focus on intersectionality. The three spheres further provide the space to look at this in connection with more social science theories, such as social constructivism. This transformative lens recognizes both the theoretical perspectives and shows how they complement each other when investigating adaptation in a case study.

4 Methods

A research project is characterized by the requirement of a rigorous approach and continuous reflection concerning how the data is gathered, how the data is analysed and what the answers found signify (Bradshaw & Stratford 2010). In this chapter, I describe how I developed a research design that informed how I gathered the empirical data needed to answer my research questions focusing on sociocultural practices and climate change adaptation. I will intentionally highlight my role as a researcher in this research process, in line with feminist research (see England 1994). This means I focus on my own role and reflect on the ways in which the research process demanded consideration and choices along the way, which affect the research design and the conclusions made.

The empirical data material was gathered during six weeks of fieldwork in Nepal in May and June 2017. I spent time in Kathmandu, Pokhara and in a rural area in the Kaski district. The methods used were a combination between fieldwork with participatory observation and informal field conversations as well as semi-structured interviews. These methods were chosen because they complement each other in the data collection.

4.1 A qualitative research design

To answer the research questions, I developed what Ragin and Amoroso (2011) term as a qualitative research design. A qualitative research design can be distinguished from comparative and quantitative research designs based on what type answer the study is looking for. The qualitative research design is suitable for exploratory research. The approach allows for many variables to be investigated and a rich description of the case studied (Gerring 2004). This is a strength when exploring a new field and opens opportunities for including other aspects that the researcher did not consider or did not know of before going into the field. The qualitative research approach was therefore considered suitable for doing an initial exploration of interactions between sociocultural practices and planned adaptation to climate change in Nepal. The theme for the study gives room for a wide investigation, so to make it manageable within the frames of a master thesis I decided to do a case study. The exploratory design was very useful and helped me identify several aspects in the field that I did was not aware of before leaving for Nepal (see Appendix I).

The aim of a case study is to limit the complexity of the empirical reality and abstract aspects that are relevant in light of the theoretical framework. Ragin and Amaroso (2011, p. 123) describes how this process can be characterized as data-enhancing, where how the case is limited lays the foundation for how relevant information later can be abstracted from the rich context. In this research project I wanted to see how CSA was implemented and contextualized in interactions with local sociocultural practices and one of my intentions was to be an outsider to the local context studied, as this provides a different perspective. I had contact with some different possible NGOs and areas which could have been relevant for a field visit. The collaboration and Nepal as the country was established through an interplay of chance, network and relevance. I established contact with a recognized NGO in Norway and was introduced to the NGO in Nepal through them. I also contacted someone in Norway who had done research in Nepal to get feedback on my ideas and learn from her experiences. I realized after some research that there were several reasons why Nepal was a good location for a case study: the diverse natural, cultural and social context described above gave me reason to believe it would be interesting to investigate CSA in the local context through a transformative lens.

4.1.1 Cooperation with a Nepali NGO

Howitt and Stevens (2010) emphasizes the importance of anchoring research locally when doing cross-cultural research. This was my aspiration for this research project, but the limitations around writing a master thesis makes co-designing the research difficult to organize. However, based on this understanding it was important for me to get in contact with a NGO that worked locally to see if there was some way I could connect my project to their work. I worked with the Nepali NGO in developing a Letter of Agreement before leaving Norway, so we had common expectations and an understanding of each other's roles. It was important to the NGO that the topic of the thesis would also be relevant to their research, but how to do it was up to me. However, all interpretations and the conclusions made in this thesis is my own and my responsibility. During the initial contact with the NGO I was provided with a contact person, whom I met up with when I arrived in Nepal. I received some feedback on my research design and questions. Two others who had done research in Nepal said that the use of audio recording may be unfamiliar and might change the way the farmers responded. This was important information to have before I did my first field visit and was very helpful to me, as I was not familiar with the context. Still, this thesis is not co-designed

research, I have, however, tried to make it relevant in the local context and the final results will also be shared with the NGO.

In qualitative methods the sampling is done strategically to get relevant informants with knowledge about the topic and the number of informants (*N)* does not need to be high (George & Bennett 2005, Gerring 2004, p. 448, Baxter 2010). If one uses quantitative methods there is often a wish to have a representative sample to be able to generalize and say something about a wider population, however this is not the intent in qualitative case studies. In order to get a strategic sampling of informants I wanted to speak to farmers that were participating in the project and people who had worked on the project or in connection to it at the NGO-level from positions in Kathmandu, Pokhara or in the hamlets. The objective was to get several perspectives on the issue; my expectation was that they would have different entry points to the same topic and therefore broaden my perspective. Throughout the thesis I distinguish these two groups, as either being connected to the NGO or as farmers. The informants I interviewed are listed in Appendix 1, with 10 people connected to the NGO and 17 farmers in the area.

When I arrived at the field site, I was put in contact with a person working locally for the NGO and living in the area of my case study. She was a very important gatekeeper (see Hammersley & Atkinson 2007), who helped me getting in touch with farmers to do interviews. She lived in the village herself and knew the people. She was very helpful in establishing the initial contact with farmers and helping my translator and I get to the right place to meet them.

Even though I wanted a strategic sampling and not representative, I had an intention to interview farmers from both genders and different castes. However, I did not get to interview many low-caste and the farmers were mostly women. This can be seen as a weakness, but the responses I got related to the gender division of labour did not differ between the answers I received from men and women I interviewed. An interesting aspect is that the men interviewed had returned after a longer period abroad and were not the ones responsible for farming themselves. However, the sampling is not meant to be representative, but rather strategic to highlight some relevant perspectives for the case study (Baxter 2010), which the farmers I interviewed had a good background to do.

4.1.2 Casing

Ragin (1992) introduces the concept of "casing" to describe how limiting and drawing boundaries for the case is a dynamic, ongoing process. It has been important throughout this case study to maintain the objective of being flexible and to having an exploratory attitude to both the fieldwork and my findings. There are many ways of limiting a case study, but I will use Thomas' (2013) distinction between the concepts of *object* (the theoretical framework) and *subject* (how it is limited in time and place).

The subject of the case study is the Kaski district, Nepal, with data collected through fieldwork in May/June 2017. The design of the CSA-project included three different sites, in lowlands, mid-hill and mountain regions of Nepal. Because of limitations of time, practical aspects of infrastructure and the project design, the fieldwork conducted for my case study limited itself to one area, and I choose to go to a geographical area in the mid-hill region in Nepal. The duration of the fieldwork means that I did not get the same insider view and understanding as one gets through more traditional ethnographic fieldwork, but Fangen (2010, p. 123) points out that a positive consequence of this can be that the data material one gets from the fieldwork can be more thoroughly investigated.

The object of the study is the theoretical framework. For this thesis, the object is the interaction between sociocultural practices and climate change adaptation through CSA investigated through the three spheres of transformation. This thesis focuses on the social system, but also includes the ecological part of socioecological systems through the category natural capital. This can be considered a weakness as this approach considerably simplifies the interact between social and ecological systems. I wanted to do the case study parallel with a student within ecology, to be able to compare and learn from each other's research perspectives, but this turned out to be difficult to organize on a practical level. However, with a focus on sociocultural practices embedded within the social systems, this thesis instead seeks to make a meaningful contribution to the "social turn" within resilience (Brown 2014, Shah, Angeles & Harris 2017). Moreover, my own disciplinary background in human geography and the broader human dimension research field I am a part of highlights the importance of a focus on social systems.

4.2 Qualitative methods

Qualitative interviewing is an appropriate method for learning more about people's perspectives and opinions and to get their perspective on the topic. It provides more information than what one can observe. Participatory observation on the other hand has the strength of providing a broader experience of the field, informal conversations and the context (Fangen 2010, p. 10). In this thesis, the methods were used in conjunction with one another, with the most weight given to the interviews, and my own observations and experiences in the hamlets providing complementary information. The interaction with those connected to the NGO included less participatory observation, but I was lucky to be included in several events and happenings that took place while I was there so I collected a lot of field conversations from this as well.

4.2.1 Participatory observation

Participatory observation is a method where the researcher takes part in the social situations and follows the people that are being studied within their contexts. You participate by being a part of the social interaction and having field conversations, which are informal conversations. This means one gets to know the people one is studying and develops some sort of relationship to them (Fangen 2010). As mentioned above, there are clear differences in the lengths of fieldwork, and the limited time I spent in the hamlets did not provide me with the amount of information about practices, compared to more traditional ethnographic research through observation (Fangen 2010). This can be seen as a weakness when addressing a research question related to sociocultural practices, and it is important to highlight that most of my findings are based on interviews and what the informants told me. Even so, I argue that my fieldwork still provided me with relevant and valuable information I would not have gotten otherwise. I gained experience with the physically demanding labour of carrying water and working with the *kudalo* in the fields. I also developed relationships to some key informants and field conversations early in the morning, from our walks between the hamlets and in the evening sitting in the dark at the *pidi* gave me a more nuanced understandings of my data. Sometimes I refer to information from these conversations as field conversations in the text. I also observed how some of the practices connected to gender were nuanced and not always strictly followed. I had sessions in the mornings and evenings writing down field notes from the day that had passed, what I had seen, experienced and my own feelings and

reflections. These notes were an important part of analysing the data afterwards and some are rendered in the thesis. The six weeks gave room for intensive data collection, talking with farmers participating in the CSA-project as well as people connected to the CSA-project by the NGO at the local and the national level.

Fangen (2010 p. 10) writes that it is impossible to predict what challenges one will meet in the field, which situations one ends up in and the choices one will have to make. There were several events that shaped my fieldwork that I had not planned for and flexibility proved to be important. I had to stay some days in Kathmandu upon arrival because the first local election in 20 years was taking place and I was advised not to travel. I therefore ended up spending more time in Kathmandu than first planned. However, I spent a lot of this time with a family I got to know, and even though they are not a part of the case study, they taught me a lot of interesting things about Nepali society and culture. When doing participatory fieldwork full time, one lives in the field and interacts with the informants continuously (Fangen 2010). My fieldwork can be considered in total six weeks in Nepal and then further split up between time in the hamlets, eating the local food, using the local facilities and sharing a room with my translator or staying in hotels in Pokhara or Kathmandu. As I will explain later, I ended up taking a short field break (Fangen 2010, p. 124), from fieldwork in the hamlets, which I had not initially planned. The reason was to reorient my research and also for practical reasons concerning my health. Even though this felt like a failure at the time, having a few days to rethink and adjust my research questions turned out to be an advantage I will look at closer below.

4.2.2 The qualitative interview

Numerous guides have been written on how to conduct a good interview, and I read up on some of these to prepare before leaving for fieldwork (Dunn 2010, Patton 2002, Cloke et al. 2004). Patton (2002) distinguishes between three different types of interview techniques: the informal conversation, the interview guide approach and the standardized open-ended interview. I decided to use semi-structured interviews as well as field conversations. The development of the interview guide was an ongoing process. I started out getting inspiration from other developed interview guides on cross-cultural studies concerning different topics. The first interview guide was operationalized based on my initial, tentative research questions and the questions were carefully formulated and reflected upon to make sure they would be

understandable to the informants. This is an approach similar to developing a standardized interview guide, and was important to me due to my lack of experience in interviewing as well as the fact that I am an outsider to the Nepali context. I did not have a chance to pilot the interview-guide in the case study site, only in a seminar with Norwegian students which is a totally different context. Upon arrival in Nepal I also received feedback from my contact person at the NGO, concerning how I could expect the interviews to proceed and what would be understandable within the context. I also asked both translators I used to read through the questions and provide me with feedback before we went into the interview setting. Despite my preparations, when I started interviewing I realized that I needed to make adjustments, as I will discuss below.

The map versus the terrain

When starting to conduct the interviews in the case study site I realised that I was not getting the answers I was expecting. My expectations regarding the practicalities for how to conduct the interviews also had to be adjusted. The best practice examples I been taught in Norway described how interviews ideally should be in a quiet, comfortable and private setting. I soon realised that this was not possible to arrange in a natural way in the hamlets. I decided that the most important priority was to make the informants as comfortable in their natural setting as possible. The interviews were most often conducted sitting out on the *pidi* in front of the informant's house, as then it was me visiting them where they felt most comfortable. Sometimes this meant that neighbours or my local contact person would also be sitting on the *pidi* listening during the interview. In these instances, my translator would ask if this was OK for the informant. I was very aware of whether or not the questions were sensitive, and discussed this with my contact person in the NGO, as well as with my translator throughout my stay in the hamlets. This shows that it is important that ethical considerations are reflected upon continuously throughout the research process. The fact that the interviews were not done in a quiet, secluded place may have affected the answers, however I would argue that this approach was more organic and created a friendly atmosphere. I found this preferable to creating an unnatural and uncomfortable setting for the informant that may have also affected the answers, although in a different way.

As mentioned above, the setting and the answers I got in the field differed from my expectations and since it was my first time in the field, I became unsure as how to continue. I

decided to take a field break in Pokhara, which initially felt like a failure. During a skype-conversation home, I got some advice; before I left home I had developed a map over the situation. When I arrived at the setting, the terrain did not match the map I had sketched out beforehand. Therefore, I needed to adjust the map. This is very much in line with what Fangen (2010) writes about the unpredictability of fieldwork and the strength of being flexible. I changed the set up of the interview and went for a more semi-structured version (see Appendix I), where I added new topics I was not even aware were relevant before entering the field. This shows how important flexibility is in qualitative research design and the explorative character of it ended up giving me new information and taking the research in a different direction than I had expected.

Patton (2002, p. 380-383) writes how the use of recording device is a strength to get exactly what the participants said. In my fieldwork those connected to the NGO were familiar with it and I got permission to use it. Before going to the hamlets, I was advised that using a recording device could contribute to an unfamiliar setting for the farmers. Based on this, I started out handwriting notes from the interviews. After a while, as I got more familiar with the setting, I decided to ask permission to record some of the interviews. My experience was that the answers did not differ that much the times I used it and the times I did not use it. Still, trying out both approaches helped me reflect upon whether it affected the informants, rather than if I had just used it straight away.

Translation

Another factor that influenced the interview situation was the language and that I was in an unfamiliar cultural context in Nepal. There are 123 languages spoken as mother tongues in Nepal in addition to Nepali as the common national language (Yadav 2016). Those connected to the NGO centrally were all interviewed in English, which they seemed comfortable with since this was a language they used at work. Documents I received from the NGO with background information were also written in English. When talking to the farmers and those working locally for the NGO I had to use a translator. This affected the interview situation and the relationship between me and the informants, as well as the data collected (Patton 2002).

Because of some practical challenges, I ended up having different translators. One translator was a man who had grown up and lived in the village and stepped in to help me out

on very short notice. He had an established role in the village, belonging to a family and a Janajati-group. I learned a lot during the first days with the male translator, about the village, the people there and he became a key informant who shared a lot of valuable knowledge with me. After a few days, a woman, also belonging to a Janajati-group, from Pokhara came to the village to help me with translation instead. This woman did not know anyone in the village from before, but her outgoing and humble personality was a great help to me in establishing a good relationship with the informants. My impression was that using translators was helpful, not only for translating language, but also for helping me understand the cultural context better. Even though the use of two different translators was not planned, I think it turned out to be beneficial, both in relation to positionality and the validity of the data which will be discussed further below.

Cloke et al. (2004) write that using interviewing as a method can be compared to putting on a play. You plan the show, rehearse your lines, think about your role and how the play will turn out, but then, when the play actually starts there is a lot of room for improvisation. Flexibility and improvising became very important, since the situations in the hamlets were quite different than I had expected.

4.2.3 Analysing the data

How the data is analyzed is crucial for the conclusions presented. Out of all the information I gathered during my fieldwork, only some parts are actually used in the final product, still the totality of data has played a role in shaping the thesis. The data I have is conditioned by the focus I had when I conducted the fieldwork, even though I constantly had the clear intention to be explorative and open to new information. Blaikie (2007) outlines four ideal-types of research strategies, i.e. how the researcher approach the relationship between the empirical data and theory during the research. However, as they are ideal-types, my approach does not fit anyone of them perfectly. By an exploratory approach I pursued a cyclic approach, moving from theory and literature, to empirical data, back to theory continuously.

I started transcribing the interviews in Nepal and completed the job in Norway. I transcribed both the recorded interviews and my handwritten notes using the program Hypertranscribe. The personal field notes were read through several times and color-coded to supplement the information from interviews. The data was coded and recoded in Nvivo inspired by Saldaña's (2009) and Dunn's (2010) tips on how to analyse, but I adjusted the

process to the data I had collected. For the first analysis, I started with descriptive codes inspired by the data material. I distinguished between the two groups of informants, since I received different information from them and this led to different codes being relevant. I was not too strict on limiting the codes and rather coded everything in the interviews with fitting codes. This was to get an overview over the content. Since their answers were directed by the questions I asked, I wanted to do this to keep an exploratory attitude to the information that had been shared with me. Based on the first coding I started writing out a text. This first draft included a lot of descriptive information that is important for my understanding of the case, but not all of it was relevant to answering the research questions. Based on this first draft I had a better understating of how I might structure the thesis and answer the research questions and how the theories could help me understand the data on a more theoretical level as well.

Secondly, I then created *a priori* categories and codes, based on relevant patterns I saw in the first draft and the theories I thought would be relevant to use. Examples of some of the codes I used the second time are the different assets, such as *social capital, human capital* or *challenging structures.* When recoding the second time I used the codes in a more restricted manner and a lot of the text was not coded. This was a data-enhancing process (Ragin & Amarosso 2011). In order to be explicit and concise in this text, there is a lot of information that is left out which, however, is still important background knowledge for me when considering the data and identifying patterns. Analysing the data and abstracting the most relevant information has been a continuous process of going back and forth, making mind maps, highlighting in different colours and searching for patterns.

4.3 Ethical considerations:

When doing research, it is important to be aware of the ethical dimensions where one of the priorities is to avoid harming the informants or using the information in ways that could be harmful to them (Vera, 2016). Reflecting upon the ethical considerations is a continuous process which has been important to take into account, develop and pay attention to from the start of developing the research design, in the field and afterwards when analysing and presenting the findings. Therefore, I highlight some aspects that are especially relevant to this case study in a cross-cultural research context. One example is how, based on feedback from Norwegian Centre for Research Data (NSD), I consider information about caste to be sensitive information to follow their guidelines. I have not described in detail some of my

observations of how caste played out spatially, since I cannot guarantee that the informants will not be recognized. I therefore use more broader descriptions in the section of caste, and refer to interviews where this was spoken of in a general manner, rather than provide detailed descriptions where people may be recognized in their local context.

However, this was something I was aware of in the field, and I was told several times in the field that caste was not sensitive information, it was an integrated part of society. I was asked in a field conversation about what castes we have in my country, and I replied that we do not have a caste system in Norway. This led to a great deal of personal reflection, because even though it is true that we do not have a caste system, we still have institution that separate groups formally and informally, for instance refugees. Still, my impression during fieldwork was that the castes were a part of the people's daily life and therefore not sensitive information to them. Despite this, there is a formal law in Nepal against discrimination based on caste (World Bank 2006) which makes it important to be aware of how the data is presented and to keep personal information confidential. This is also the reason why I have not linked gender or ethnicity to the farmers in the attached list of informants (Appendix III). An important point is to keep the data confidential and anonymise the participants. The data were coded and personal information that was connected to the data material was stored in a separate document. Both translators signed concerning contract on confidentiality before starting the work. The participants were informed that their connection to the NGO is made clear in the thesis.

The research project was reported to NSD and approved. I decided to go for oral consent instead of written because of the language barrier and the high degree of illiteracy in Nepal and also the diversity of languages spoken (Yadav, 2016). My consideration was that this would be more ethically more appropriate than asking for a signature on a document which was incomprehensible to them. Instead, I talked through a written version (Appendix II) with my translator beforehand, regarding what was most important to emphasize and the importance that we were given an informed consent before starting the interview. The written version of the informed consent was inspired by earlier masters students who did their fieldwork abroad (Høiland 2016, Saaghus 2016). However, conveying this information in the rural Nepali context was a learning process, where I followed directions by NSD highlighting which institute I am studying at as well as giving out my contact information if they wanted to get in touch with me afterwards.

For contact, I gave out my Nepali phone number that I had during my stay, as well as my supervisor's and my own e-mail addresses. In some instances, this was not useful for the farmers, since they did not have an e-mail or were unable to write to me in English, but it invoked laughter and a friendly atmosphere. In an attempt to find a good option for this, we agreed that if they wanted to they could contact me through the NGO's local contact person, which would be able to get in contact with me after I returned to Norway. I experienced it as an advantage that the NGO was known in the field and that they had had visiting master students before when explaining my role. For the employees that I interviewed in the cities, the informed consent was sent with the request to interview them, along with Appendix II. I was open to everyone I met in Nepal about my role as a student writing and learning about Nepali culture, which led to many interesting field conversations.

An important point is to try to give something back to those who kindly gave of their time and shared their knowledge with me. At the same time, it was important to me to have a role as a researcher, and not mix it with a role of a tourist or from a NGO that would provide something in return. For those I stayed with, I was able to take some pictures that I gave them. The thesis will be sent to the NGO after submission in Norway, in order to give something back and because this was something they requested.

4.4 Critical reflections on the method and data

When doing research, choices are made along the way. These choices influence what empirical data I collect and while it is not possible to avoid this impact, it is important to reflect upon it. I will therefore look closer at how my positionality in the field can have influenced the data, how an outsider's perspective is different from that of an insider and also consider some choices I have made that were beneficial is some ways, but limiting in others.

4.4.1 Knowledge from somewhere

Traditionally there was the ideal of objectivity when doing research, but within the social sciences, especially critical science like feminist research it is emphasized that there is no such thing as objective knowledge. England (1994, p. 248) argues for this by describing the researcher as an instrument for doing the research and reflect upon how people have diverse backgrounds as positioned subjects which influence the research. She argues that: "The

researcher cannot conveniently tuck away the personal behind the professional, because fieldwork *is* personal" (England, 1994 p. 249). To reflect upon one's role and power relations in the field as well as how my background affects the research more generally is thus important. I will exemplify the theory behind intersectionality and social identity described above to reflect around my positionality in the field.

When doing my fieldwork in Nepal, I had several social identities that were made relevant in different situations (see Fangen 2010, Hammersley and Atkinson 2007). Some of these identities are closely connected to me as a person, such as being female, in my mid-twenties and from Norway. Other identities are more connected to the specific situation as a foreigner in Nepal, a student enrolled in higher education and that I was introduced through the NGO. These social identities are not static, in the context of Norway my identity as a student can give associations of being poor, while in Nepal I experienced my identity as Norwegian gave associations of being rich.

These identities are played out in relation to the informants in a dynamic way and also change with time during fieldwork. One example was how I was called "Didi Ann" in some field conversations after a while, which translates to Sister Ann. This was a label used in a wider sense than family relationships and symbolising more of a friendship. My role differed in different situations and for different people, from being a visitor, a student, a foreigner and even developing friendships. An example of this was how I was invited to a ceremonial party in the village. My fieldwork in the hamlets was supposed to be over so I went without a translator. This was an instance where the language was a barrier and my lack of knowledge of norms and traditions marked me as a foreigner, but I was also included in ways that marked me as more than just a researcher asking questions, but as a participant in an important event.

In the interview situation, the relationship between the informant and myself is partly negotiated through the practice of establishing rapport, but this should not go on the expense of being neutral to what is told (Patton 2002). I was first introduced by a local person working for the NGO as a student from Norway when asking for the interviews and then through the informed consent from my translator. The fact that I was introduced to the farmers through the person working locally with the NGO affected the situation and implications from this will be further discussed below as trade-offs in the field. It was important to me express humility and that I was eager to learn from the informants as well as gratitude that they were willing to share their knowledge about something they know a lot about and I knew little

about. I also tried to learn a bit of Nepali before leaving for fieldwork and I used the few phrases I knew in several instances as a way to break the ice and start out with some laughter. This was also a way of demonstrating how they have a lot more knowledge about the Nepali way of doing things than I had.

Having more than one translator, gave me the opportunity to compare if answers were translated in very different ways. Their background also affected the research situation. The male translator had an established position and relationships in the hamlet. In one interview with a woman from a lower caste, he made a comment afterwards that the women might have felt that she had to give the right answers. This could be connected to my status as a foreigner, or to him as a male from a higher caste. The female translator, who helped me most of the time, had a very open personality and was very good at creating a friendly tone, even though she did not know anyone in the village before.

A challenge when using a translator is the validity of the answers (Patton 2002). The answers given by an informant are first interpreted by the translator, then translated to English and then interpreted by me. It was not a direct translation and I reflected in the field on how nuances from the answers were lost. This is a reason why I have not used a lot of direct quotes in the text, but instead paraphrased the meaning and information we discussed. This was also a reason for redirecting the interview-guide, going from asking clear questions to rather discuss themes. However, in some instances there were quotes in some interviews and field conversations that seemed so special to me, that I specifically asked to write them down as quotes. The difference between field conversations and interviews, which informants to list in Appendix III, and how to reference the empirical information when writing the thesis was a topic of reflection and cautious choices. The informants listed in Appendix III are the once I sat down and had semi-structures interviews with. However, I use knowledge from field conversations and observations as well in the thesis, and in these instances, I do not refer specifically an informant, while this is from handwritten field notes taken throughout the fieldwork.

It was easier to get access and answers to questions concerning gender, than questions concerning caste in the field. This could be connected to my positionality as a foreigner, not a part of the local structure and sociocultural norms or in connection to my translator belonging to a different caste than some of those I interviewed. I collected some data, but I also use more supplementary data from other's research to put my findings into a larger picture, and

see how it resonates with the findings of others. My positionality was different with the group of informants from the NGO. My initial contact with the NGO was established through a collaborating NGO in Norway, which meant some of them had some preconceptions of Norway even though there was no collaboration connected to the project I was studying. Still, my angle into the topic and the questions were from a different context and this provided a rich opportunity for more in-depth discussions and gave more richness to the data.

4.4.1 Cross-cultural research

One of the main challenges in the design of the research study chosen is to consider whether I as an outsider can actually say anything at all about Nepali culture studied through practices, especially after only six weeks in the country. England (1994) reflects upon this aspect and tells a story of one of her own "failed" research projects on the spatial aspect of lesbian identity construction, while based on the motivation of giving voice to a marginalized group she: "…worried that I might be, albeit unintentionally, colonizing lesbians in some kind of academic neoimperialism." (quote England, 1994, p. 247). This is a fear I have worried about myself several times throughout the process. A question that I continuously have asked myself is "Who am I to say…" Still, I am convinced that cross-cultural studies are important and that an outside perspective is not necessarily bad, but that it is important to highlight how this perspective affects the research (Howitt & Stevens 2010).

Before I left, I read up on the Nepal and climate change adaptation and based on different readings (see Bennett 2002, World Bank 2006, Bhattarai, Beilin, & Ford 2015, Nightingale 2011) I decided to use an intersectional perspective to study the practices, because I expected there to be different practices connected to different social identities. These categories are relational and dynamic rather than static entities and situating the case study is therefore important. Also, the number and which categories that are relevant will differ with context and following Christensen and Jensen (2012) I decided to choose some categories a priori to the fieldwork to focus on. This was a choice to direct my focus and make it more manageable as a first fieldwork experience in a new context.

An important guideline throughout the research has been to be aware of the separation between ethnocentrism and cultural relativism. Fangen (2010, p. 168) points to how they are often seen as opposites. Culture relativism can be described as studying a culture based on it's own premises, while ethnocentrism is comparing the culture morally and normatively to the

researcher's own culture. Fangen (2010) complicated this picture by arguing that culture relativism can be seen as a methodological principle rather than a normative principle. I have tried to follow this division throughout the thesis, by describing what I see and analysing it with the analytical framework, without making moral judgements. Rather I highlight the interplay to allow for greater awareness of the interactions, which will be important for policymakers and NGOs working within this context if there is a desire to have successful adaptation *for everyone*.

4.4.2 Reflexivity and trade-offs

I have highlighted several challenges above related to the fieldwork. The terms reliability and validity come from quantitative methods and are used to assess the data. Reliability is concerned with the researchers influence on the data, and whether a different researcher would come to a different conclusion (Fangen 2010). Bailey et al. (1999) are critical to how research is often portrayed dualistically as either a standardised, rigourous approach which may claim to be objective and neutral versus a rhetoric, creative way of approaching the research process. They rather suggest reflexivity at all stages of the research and transparency concerning choices made along the way, and they suggest that this will contribute to a more valid research. This process of research is characterized by choices and prioritizing. It has developed continuously as I have worked on this thesis, as I have gained new knowledge and corrected the path along the way to make it fit the new information I found. The discussion above concerning the map and the terrain when conducting interviews is one example. I would argue that adjustments like those taken along the way contribute to the validity. A sense of humility is valuable when recognizing that the initial approach was not flawless, and flexibility is necessary to adjust to the new knowledge gained along the way. This flexibility also contributed to an emphasise on exploring new opportunities for knowledge I had not thought of beforehand. It also appeared to me that several choices I made were trade-offs, with both advantages and disadvantages.

Having a feminist approach to the research I have reflected upon how my background and position probably will have affected my conclusions as well as the perspective I interpret them within. However, this would be true for any researcher. I made a choice of collaborating with a local NGO to get a local anchoring of my research, but this can be considered as being at the expense of not being as independent as I could have been otherwise. The connection

can have influenced the answers I received. Based on this, the research questions are not directed towards assessing normatively how the project itself worked, but instead understanding how it intersects with sociocultural identities and practices. However, through continuous reflection I have done my best to be aware and to be transparent about the choices I made and trade-offs they led to.

By looking at the data in connection to existing research in the field and how it resonates with this I have tried to connect my findings to a broader understanding of the field. It is important to reflect upon the answers I got and interpretations I have made. I do not hope to generalize directly based on the findings I present. I rather argue that it is one example of how CSA is implemented locally, and some of the effects that are seen or considered possible in the interplay with sociocultural practices. It is not transferrable to other cases, but I abstract some arguments and findings based on the data, that suggest aspects that can be relevant to consider generally when implementing CSA in different contexts.

As a qualitative case study this study does not give an exhaustive picture of all aspects of the case. By focusing on a few relevant aspects, a lot of supplementary information that has been important for my understanding of the case but not directly relevant to the thesis has been left out. The method has been chosen with the background of wanting to go into depth on some aspects related to adaptation. The choice of going deep is then necessarily at the expense of going broad. The findings I have are not generalizable to a broader population, and it might not even be true for all of the people living in the case study area. It reflects the knowledge shared with me by the informants and my interpretation of these. However, the findings do say something about how CSA was implemented and understood in this situation and shows some broader tendencies and aspects for further research. I will highlight this after the discussions.

4.5 Summary

In this chapter, I have explained what I have done to gather the empirical data used to answer the research questions, and the considerations made along the way. I have used a combination of participant observation and interviews, two methods that have given complimentary information. The ethical considerations have been a continuous process throughout. I have emphasized to my role in the research process and the choices and trade-offs I have made

along the way. I argue that research within the social sciences, such as feminist research is not neutral nor objective, but that transparency and reflexivity therefore needs to be highly prioritized.

5 Gender and resilience

In this chapter the relationship between sociocultural practices of gender and adaptation towards resilience is explored. I start out by outlining some of the main characteristics of farming in the case study area, based on information from my time spent there. I identify some sociocultural practices connected to gender and farming that are relevant in connection to adaptation. These findings are investigated through the five capitals of livelihood resilience based on Thulstrup (2015) and as nested systems (Walker and Salt 2006). Based on the findings from my case study, I use the three spheres of transformation as a lens to explore the interaction between sociocultural practices and adaptation intervention (see O'Brien & Sygna 2013). It is outside the scope of this thesis to investigate all the different norms and practices related to farming in Nepal. Rather, I will highlight and emphasize some specific practices that were acted out in relation to the different adaptation interventions and that could be seen in connection to different social identities. Resilience was defined above as "a measure of the level of access to endowments of capital – financial, natural, physical, social, and human – that can be mobilized in order to respond and adapt to environmental change." (Thulstrup, 2015). I further investigate how the social construction of sociocultural practices as undersood by Berger and Luckmann (1067) and Reckwitz (2002) provides room to alter the existing structures.

5.1 Farming at the case study site

While the topographical division of Nepal runs north to south, the political division is more east to west, with five development regions called east, central, west, mid-west and far-west (Vandernoot & Hove 2014). This case study was conducted in the Western development region, in the Gandaki zone, in the mid-hills of the Kaski district. It is not a case study of farmers in the entire district of Kaski, but rather focuses on some hamlets located within either walking distance from each other or a bus ride apart. The area where the CSA strategies were piloted was delineated by the borders of a Village Development Committee (VDC). However, the administrative borders within Nepal changed between the implementation of the CSA project and when I conducted my fieldwork (Kathmandu post 2017). Therefore, I refer

to Kaski as the district of my case study, even though the interviews and observations are from a smaller area consisting of what I chose to call six smaller hamlets.

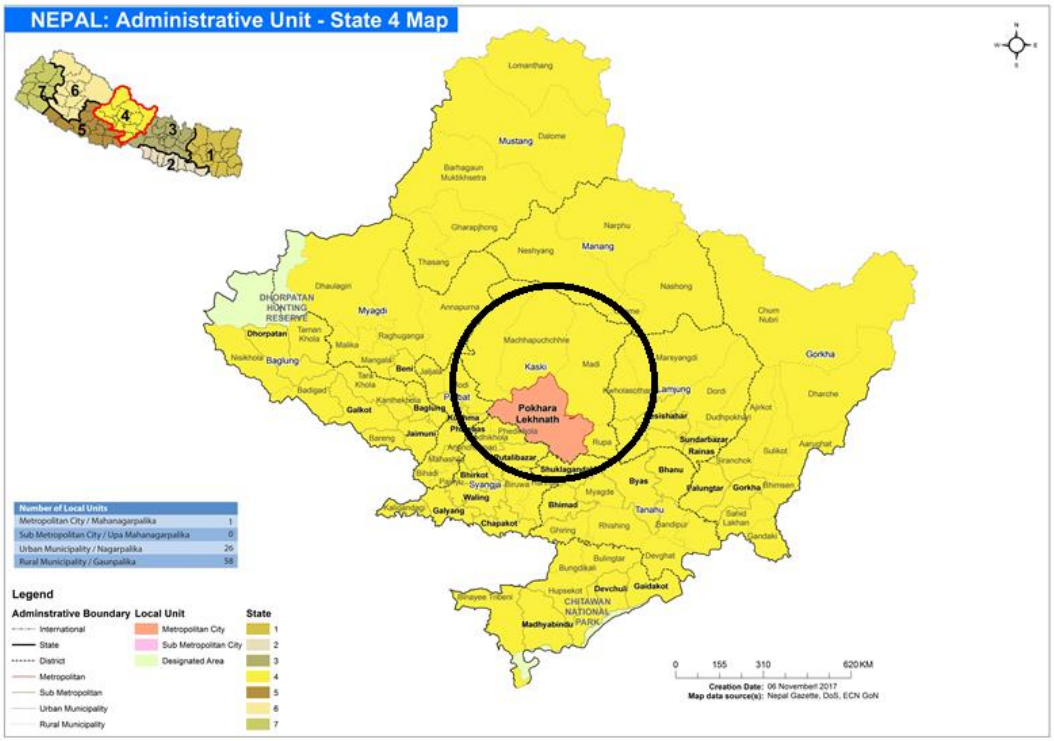

Figure 7: Location of Kaski district in the Ghandaki zone, Nepal (Source: UN Nepal Information Platform, n.d, circle added by author.)

Farming at the case study site is mainly based at the household level, called *pariwar* in Nepali. Aase and Chapagain (2017, p. 238) define a Nepali household as: "…a group of consanguinally[4] and affinally[5] related people who hold corporate property rights to land and whose members are affected by decisions relating to that property." Inter-caste marriage is not common in Nepal (Pariyar & Lovett 2016), and members of the same household belong to the same caste and follow the same norms and practices. The household often has an intergenerational structure and I was told that when a son gets married, the new wife would traditionally move into the husband's household. The household not only consists of the people who are living in the house currently, but people who have migrated for work or

[4] Related through descent.
[5] Related through marriage.

studies can still be considered as a part of it. The number of people considered as a part of the household I interviewed ranged from four to 18.

Farming at the case study site is an integrated system where both livestock and cultivated land are important. The main natural capitals I identified are fields, forest, livestock and water. Around the houses and between the hamlets, the area is characterised by terrace farming (See Figure 8). This means that there are relatively small fields separated by different levels of elevation. The topography of the area results in a generally steep inclination of the ground.

Figure 8: A picture of terrace farming (Photo: Ann Kristin Schorre 2017)

The fields are separated into two different types of land; *bari*- and *khe*t-land. *Bari*-land is upland, rain fed fields, often closer to the houses. *Khet*-land is land placed lower, with the irrigation channels are called *kulo* in Nepali. Most households said that they have both *bari*- and *khet*-land, but some only had the *bari*-land around their house. Generally, the *khet*-land was further away and a farmer estimated that it took 45 minutes to walk to their land (Informant 19, Farmer) while another farmer told me that they did not use their *khet*-land, as it was too far away (Informant 13, Farmer).

The hamlets had a public bus connection to Pokhara, a large city in Nepal. This was seen as a significant improvement, as it earlier was no bus connection, and they would have had to walk. In most of the hamlets there was one bus going every morning and one bus returning every afternoon from the city and one hamlet served as a central point where several busses passed through. The bus going every day meant that they had the chance to get groceries from the city, sell any extra crops or products they might have produced and reduce the distance for bringing back crops after harvesting (Informant 13, Farmer, Informant 11, Farmer).

Common to all the farmers I spoke to was that they grow a diversity of crops, instead of specialising in only one or a few. There are differences in what people grow in their *bari*- and *khet*-land, because of the difference in natural conditions. Some of the crops grown in the *bari*-land were maize, finger millet, soybean, cowpea, pumpkin, garlic, onion, cucumber, tomatoes and mustard. In *khet*-land I was told that it was common to grow rice, and the baseline survey from the NGO supplements this information by adding that some also grow potatoes and lentils in their *khet*-land (Bhatta et al. 2015, p. 13). Some also had fruit trees around their house. This shows how there is a diversity within the natural capital at the case study site. In addition to the fields there are also forests, surrounding the hamlets. The forest is a source of fodder for the animals, and also important as a source of firewood for cooking, since it is common to cook inside over an open fire. Water was available at community taps. To get there one had to walk on small paths for quite some time and carry it back, a task that was both time consuming and physically demanding.

The livestock contributes to the farming system and the household in several ways. The buffalos provide milk, and other dairy products like *ghee* which is a type of butter. The manure from the animals is used in the fields. The ox is used for manual labour, such as ploughing the fields. There is also a possibility of renting out the ox to other farmers to plough their land, so it can be a source of financial capital. The data from the NGOs' baseline report of the VDC where the CSA-technologies were tested shows that farming is the single biggest income contributor to the household in the areas contributing to 38 percent. The second biggest source of income was from remittances, which is money sent home from people who have out-migrated, contributing to 18 percent of the total income (Bhatta et al. 2015, p. 16). The domesticated animals are an important part of the farming system and the households' natural capital. Some of the livestock that were common were ox, buffalo, goats and poultry.

The general level of technology used in the farming is very low. I observed and tried to participate in farming by using the *kodalo* for harrowing a field before planting, which was a physically demanding job. Many tasks were traditionally performed without any tools, like separating corn from the stem with a hand-movement technique. I was told this technique easily caused blisters and was time consuming. Another demanding practical task was separating the finger millet grains from the stem. I was told that this traditionally was done by placing the cut finger millet on the ground, tying an ox to a pole and letting the ox walk

around the stick to step on the finger millet. This way of doing it is both time consuming and the grain could easily become damaged and useless.

As mentioned, there is significant geographical diversity in Nepal, and even at the very local level climatic diversity is high. I was told there were differences in what crops were most suited to grow in the different hamlets in the area (Informant 4, NGO). Climate change is predicted to be a challenge to the farmers in the case study area and the baseline report for the CSA-project shows that hailstones, drought and insect pests are the biggest hazards they are facing (Bhatta et al. 2015, iv).

As shown, there are multiple challenges facing farmers in the case study area. Several of the challenges are not new. The terrace farming is an adjustment to the topography and the low level of technology, hard physical work and male out-migration has a long history. Some challenges are felt in everyday life, like the work associated with getting water. Others, for instance climate change, can be felt as a shock through a natural disaster as well as a gradual challenge with increasing the temperature. The decreasing status of farming was also highlighted as a challenge. I was told that nowadays the youth want to have the work distributed as a workday, which is quite different from the nature of seasonal farming and the daily activities connected to livestock which does not follow what can be considered office hours (Informant 2, NGO, Informant 13, Farmer). As I will show through findings and in the discussion, the diversity of stressors within agriculture locally is important to take into consideration when implementing CSA in a specific location.

5.2 Gender division of work

"In this area it is mostly the women who do the farming."

(Informant 5, Farmer)

The first finding was that there was division of labour within the case study area, and that women were considered mainly responsible for farming activities and household work. Specific types of work were associated with the different genders. Related to farming, the task of getting water, planting and going to the forest to collect firewood and fodder or grass were mainly considered women's jobs. Ploughing on the other hand, was considered exclusively a man's job. Answers differed when I asked if the man would help with the farming tasks if he

were at home. The gender division of work did not appear as a strict division in all instances. As mentioned, getting water was considered mainly a female job, but I observed a man that was home from working in the city who helped with carrying water and getting grass for the domesticated animals. These practices connected to gender did not seem to have a strict normative dimension connected to them, as he said he would help with these tasks if he had the chance. Still, he often worked in the city and was not at home for periods of time. This shows how some of the sociocultural practices are flexible, but the out-migration places a limitation on the gender division of labour and plays an important part of the feminization of agriculture in the area.

5.2.1 Male out-migration and lack of human capital

«Male out-migration and feminization of agriculture are two sides of the same coin»

(Field conversation with a man living in the hamlet).

Several of the female farmers I interviewed told me that they were solely responsible for the farming, and many pointed to the reason being male out-migration. The NGO's baseline survey shows that in the area about 40 percent of the households have someone absent, and of those who have migrated around 90 percent are male (Bhatta et al., 2015, p. 16). When talking about migration with informants it appeared to be a practice, but it also had a normative dimension to it. It is not something everyone does or has to do, but at the same time, it was mentioned as an obligation to feed the family. I was also told that traveling for work opportunities is not only an individual choice, but more often a household-decision, which suggests that it is discussed collectively.

Migration can mean that entire households leave or that some members leave. The gender dimension is visible when some members leave the farm while others stay behind. I was told in field conversation about a hamlet of six houses where all of them were abandoned, even though the government had invested in water and electricity. The reason, I was told, was that all the members of the households had moved to the city for work and education.

There is a long tradition for some groups in the case study area to migrate, like the ethnic group Gurung. Bista's (2004, p. 92) description of Gurung's and their history shows how remittances have been an important source for income for a long time and there was a tradition for joining the Indian and British armies. However, there has been a change in

destination and type of work that people migrate to do. Because of globalisation, people can travel further and to other destinations. During my visit I talked with youth in field conversations, in both the cities and in the village, concerning which countries were the most attractive to migrate to. In these conversations we talked about how leaving home for a different country, often for a long period of time, even years, can be hard for the person leaving. The work can also be physically demanding and sometimes dangerous. At the same time, it was discussed as an obligation to contribute to feed the family and for better opportunities. However, out-migration also increases the workload of the women staying behind who are left responsible for the household and farming. From this perspective, out-migration contributes to a lack of human capital at the farm.

> "We are working in the sense of helping each other"
>
> (Informant 16, Farmer)

One way of meeting the lack of human capital at the household level, was "worksharing". This is a way of helping each other by working together with neighbors. I learned about two different ways this was done, called *parma* and *huri*. In *huri* there were more than ten people participating while in *parma* there were fewer people working together. *Parma* was described as a tradition of helping each other (Informant 16, Farmer). The practice was often connected to seasonal work, where in periods there was a lot of work to do. Working together made the work easier, while it was more efficient to work concentrating on one field, before moving over to another field a different day(Informant 23, NGO). One farmer told me that when working in *parma* one day of work by a man was equivalent to two days of work by a woman. This was connected to the perception of females being physically weaker than men, and therefore an uneven relationship between the time spent working and the amount work done between the genders (Informant 19, Farmer). In a different conversation I was told that you would get back the same amount of work done without it being connected to gender (Informant 18, Farmer). This is important to mention because it says something about how the female work was perceived and valued compared to male.

5.2.2 The challenge of out-migration: Resilience at different scales

The gender division of labour at the case study site was seen in connection to the sociocultural practice of male out-migration. This thesis set out to explore how farmers are adapting to climate change through a CSA project and those leaving farming were not the focus. However, the findings suggest that male out-migration does affect how farming is done at the case study site and affects the implementation of adaptation interventions. I did not focus on reasons for out-migration specifically in my interviews, but through field conversations the importance of financial capital for households as well as the difficulties in getting other jobs in the area were highlighted. This resonates with Paudel et al. (2014) who identifies how farming is characterized as an unattractive, demanding occupation, which play a role for families when leaving their farms to seek opportunities in urban areas. However, I will rather explore how this practice affects the overall livelihood resilience of those staying behind and will therefore be understood through the lens of five capitals and adaptive capacities.

Transformation to increase resilience

There were several types of migration that were relevant in the case study area. Migration of some members of the household was the most common type I encountered, because I often then spoke with the woman staying behind. However, as described earlier there were also an entire hamlet we could see from the water-tap that was abandoned and the entire family had out-migrated. If whole families out-migrate for either education or work, it can be considered a transformation, in the way the concept is used within resilience. To use the metaphor of a ball in a basin, the household (considered as a system) changes the basis for their livelihood, passes a threshold and enters a new basin with a different center of attraction (Walker et al. 2004). Farming as an income source and as the dominant daily activity for the household is abandoned and they need to find a different source of income, which provides a new stable state for the regime and can be considered a deliberate transformation at the household level. In this way, the social identity of farmers is replaced with a new social identity tied to a type of labour.

With several challenges facing farmers and making them vulnerable, out-migration can be seen as an adaptive strategy (Chapagain & Gentle 2015). Migration can, in light of climate change, be understood as enhancing resilience at the household level, while it

removes the insecurity of being directly dependent on natural resources and hard physical labour every day. However, to think of this strategy through the panarchy model (Holling, Gunderson & Peterson 2002), where the household level is an integrated sub-system of the national system, it becomes clear that there are trade-offs between scales. Even though the strategy can be beneficial at the household level, if too many people abandon farming it can contribute to decrease food security and resilience at the national level (Paudel et al. 2014, p. 12).

Individual transformation for household adaptation

The other type of migration discussed was when only one or a few members of the household out-migrate for work. In this case the farming system at the household level is not transformed and farming is still a main activity at the household level. It may be viewed as an adjustment to increase the households' resilience to external shocks. This is because out-migration may be considered a strategy for income diversification, thereby contributing to an increase in the households' resilience to external shocks and moving the thresholds for the system (see Walker et al. 2004). If a natural hazard affects the area, it increases the households' flexibility to have a source of financial capital besides the natural capital from farming. This flexibility can be considered increasing resilience based on Thulstrup's (2015) definition. Also, financial capital has some strengths in itself, there are some expenses that need to be paid with money, like school fees or if a member of the household needs to go to the hospital.

At the individual level, it can be considered transformative to out-migrate to support the family. Resilience at the household level is increased, by increasing how much the system can change before it is transformed (Walker et al. 2004), but it can also be understood as dependent on transformation at the individual scale to leave one's family and home. However, when looking at these relationships as nested through the panarchy model (Walker and Salt 2006), the individual is considered a sub-system of the household. The strategy and practice of male out-migration to increase resilience at the household level can be understood as decreasing the individual adaptive capacity of the woman in the same household. As an unintended consequence of the male out-migration, the household's overall human capital available for agricultural work is reduced. This adds to the vulnerability of those left behind if they are overburdened by the workload. This shows how the panarchy model is crucial for

understanding the unintended consequences of adaptive strategies, and how what might be successful on one scale is at the expense of resilience on a different scale.

Resilience for whom?

To migrate and the practical consequences for the household is a change within the practical sphere of the three spheres of transformation (see O'Brien & Sygna, 2013). However, the analysis shows how this change, which can increase resilience at the household level, can have negative side-effects within sub-systems. The political sphere highlights how within each household there are choices that are made and prioritizations between different types of capitals, such as human capital or financial capital.

In this case, norms might influence the choices that are made when out-migration is considered a normal option. When one member out-migrate financial capital is prioritized over human capital at the farm. Another possibility is that migration for education provides a temporary loss of human capital, but then increases the human capital when returning with new knowledge. Thulstrup's (2015) definition of resilience does not prioritize any of the capitals as more important than the others. When only some members of the household migrate, the practice affects the livelihood resilience for those staying behind. To understand resilience on different scales with a focus on those staying behind to farm in the hamlet, the case study shows that the woman's individual resilience is connected to the household resilience, but not reducible to it. The question of "resilience for whom?" becomes important (Cote & Nightingale, 2012). This provides the background for targeting certain types of work considered the women's responsibility, to enhance their resilience and thereby also the household's resilience.

Another interesting aspect is how out-migration influences or is influenced by the personal sphere in the three spheres of transformation (see O'Brien & Sygna 2013). How are the deeper psychological consequences of out-migration affecting the quality of life for those left behind and those migrating? This is an area for further investigation with a focus on whether the strategies are socially sustainable, rather than just focusing on the practical and financial aspects of remittances. These differing views on the possibilities and limitations of financial and social remittances are connected to a broader debate on the role of remittances as either positive or negative to development (Haas, 2012).

In this thesis the practice of male out-migration is seen as a practice forming the context for development of planned adaptation interventions. This section has argued that male out-migration is a practice that contributes to a gender division of work. Male out-migration is an immediate challenge for the farmers in their everyday activities and therefore important to take into consideration for the adaptation interventions. This discussion highlights how out-migration can be both what is considered transformational or adaptive in the resilience literature (Walker et al. 2004).

5.3 Gender-oriented adaptation practices

As shown above, there is a gender division of labour and the male out-migration contributes to this. This shows how resilience at the household level can be at the cost of the individual level. As I will show below, the women's human capital was a focus for some of the interventions introduced as a way of avoiding trade-offs between resilience on the different scales.

5.3.1 The challenge of water

Both farmers and NGO-workers pointed to having enough water as one of the main challenges in the area. For the farmers, access to water is a daily challenge while getting water is an activity that is time consuming and physically demanding. This was something I noticed and reflected upon during my stay and in field notes:

> "An example is the water situation in the household where I am staying. It is quickly decreasing! (…) Five empty buckets stand before me in the hope that there will be more rain later (…) how challenging it is that there comes a lot of rain in periods and then it stops for periods. This is an vulnerable and difficult situation for the people living here without much of a buffer " (Field notes translated from Norwegian (3.6.2017)).

Figure 9: Woman carrying fodder in the dako namlo (Photo: Ann Kristin Schorre 2017)

The next day I was able to participate in getting water:

> ”In the evening, the household did not have more water and I asked whether I could join in as they collected more (…) We first walked to a tap about 10 minutes below the house. It turned out that the tap did not work (…) We continued to walk around 15 minutes more and found a different tap(…) There were other people from the hamlets there, filling up bottles and washing clothes (…) When it was our turn to tap water, the tap was empty.” (Field notes translated from Norwegian (4.6.2017)).

I was told that it did not happen that often that the tap ran out of water. However, the person I was with knew where to find a different water source, so it did not seem like the first time this had happened. After filling up bottles we carried them in *dako namlo* (a basket carried on the back attached with a strap around the head (see Figure 9) up the path back to the house. This was physically demanding and as a daily task it was time consuming. Some days the household had to go twice to fetch water for drinking, cooking, to the animals and other household tasks. Changes in rainfall patterns are seen as being one of the challenges associated with climate change (Bhatta et al., 2015). Changing rainfall patterns can have an extra impact on women and their workload because they are considered responsible for getting water. Based on this practice the CSA-project offered some innovations especially targeted at the challenge of water.

Innovations for water

One CSA-innovation aimed at addressing the challenge of water was a plastic pond. The pond was placed so it collected waste-water from activities such as washing hands or doing the dishes. Also rain water would contribute to filling up this pond. The water could then be reused in the fields around the house. This demands an investment of financial capital to get it installed but after this initial investment the pond can contribute by increasing access to water as a physical capital, and reducing the output of human capital by saving time by not having to go to the tap. It was

Figure 10: Picture of a plastic pond (Photo: Ann Kristin Schorre 2017)

pointed out that this innovation may rather increase the coping capacity, rather than the adaptive capacity, as the use of plastic is not an environmentally-friendly choice and not sustainable over a long period of time (Informant 1, NGO). The option to construct ponds with more lasting materials was also considered, but this posed a challenge with a trade-off in regard to price, as it is more expensive to invest in. I only observed the plastic pond at the houses of farmers I spoke with. For some farmers the plastic pond was combined with a drip irrigation system as an effective way of providing water for the fields. This innovation can be considered to reduce time used for watering and the amount of water used. With access to enough water being a challenge, these innovations were something several of the informants I spoke to had and that were thought of as helpful.

Another innovation in addition to the plastic pond and the drip irrigation, was a plastic house. This was in essence a plastic roof stretched over a wooden frame creating a ceiling over the crops. The plastic house could also be used independently and served to shade from the sun, as well as protect from heavy rain and hailstones. The plastic roof could be removed and thereby reduce the wear and tear from wind and weather if the field was not being used. From a systems perspective, introducing a plastic house is an initial financial investment that with time can serve to reduce the loss of natural capital by hailstorms, as they prevented them from damaging crops. At the same time, a farmer stated that the plastic house provided an option to grow more crops outside the normal planting season (Informant 17, Farmer). In this case, the increased physical capital can be transferred into financial capital if one can take the extra harvest to the market, which will be looked at more closely below.

Figure 11: Plastic house (Photo: Ann Kristin Schorre 2017)

5.3.2 Tools to ease woman drudgery

> "Because, being a developing country, we haven't even seen very basic or very simple technologies which have been long ago tested and used by people outside the country."
>
> (Informant 2, NGO).

I was described how there earlier had been very little use of technology in farming and a lot of the work was physically difficult and demanded considerable human capital. Some of the innovations introduced through the CSA-project were tools and technologies. These can again be separated into implementation at the household level and the farmers group level, due to a difference in how much it cost to invest in the tools and how often they were needed. Some of the smaller tools are practical enough to have in each household for daily farming activities, while others are only used a couple of times a year and it therefore makes sense to share among a group.

Tools for individuals

Some of the interventions offered to the farmers to help reduce the drudgery were several smaller tools. One was a handheld garden tool to help with weeding, but also gloves to protect the hands and kneepads for working were described as innovations. Another popular example is a corn sheller, which many farmers had and I was told was very effective in separating the maize from the stem. These tools are aimed at reducing the workload for women. Several of my informants used these tools when farming and said that it made their work less physically demanding. A female farmer told me that the introduction of new tools and that things were becoming modern had increased her husband's interest in farming, and that he had started to help her out with some of the work she normally had done herself (Informant 6, Farmer). This is further decreases the workload of the woman within that household and increases her free time.

Tools for the farmer-group

One of the tools introduced by the project was a finger millet-thresher, and this was introduced at the collective level as something the farming-groups (cooperatives for collaboration between farmers) could invest in. In this way, the collective could join together

to make a financial investment in a larger tool that was not used very often. This tool is, in the same way as the smaller tools above, saving the farmers time. It also takes away the risk of damaging the crop in the threshing process. This innovation is relevant as a way of increasing the household resilience by increasing natural capital and saving human capital. As a part of the CSA-practices goals, it contributes to increased food security if less crops are damaged and this results in increased production.

The work of ploughing the land was considered a male task by the informants I spoke with. Ploughing should not be done by women or by people belonging to the higher castes. Several of the female farmers said that they used to rent in external workers, *majdori*, to plough their fields since it was a job they could not do themselves. This was explained as buying labour and sometimes even renting the bullock to plough the fields. One informant told me that since they had so much *khet*-land demanding a lot of physical labour, she used a lot of the remittances her husband sent home on renting in workers to work on their land (Informant 20, Farmer). One innovation directed to address this challenge was the technology they called a mini-tractor. Because of the terraced fields this is a small machine (smaller than a normal tractor) that can help make the ploughing and tilling easier, as it would take away the need for an ox.

I was told by several female farmers that they could not use the machine because the machine was too physically demanding for them. One farmer told me that she could have used it, but she needed men to help her get it to the fields, and since this was not possible she did not use it (Informant 22, Farmer). In this case, the lack of physical capital, good infrastructure like a road and the possibility of getting the mini-tractor transported to the field are barriers to the innovation. One farmer told me that they wished they could have something smaller, so the women could do the work themselves without the men (Informant 16, Farmer). One person working for the NGO turned the issue around by pointing out that having a smaller machine may actually add to the women's responsibilities and contribute to the female drudgery (Informant 2, NGO).

5.3.1 Reproducing the social structures or creating room for alterations?

> "If women's needs are different, than we need to offer different solutions to women."
>
> (Informant 2, NGO)

The findings show how the sociocultural practice of a gender division of work can provide a background for implementing adaptation interventions with the motivation of targeting agricultural work women are responsible for. This division between the needs of men and women when adapting resonates with feminist research on adaptation (Bee 2016). The plastic pond, the plastic house and the drip-irrigation system are three innovations within the practical sphere of adaptation. Seen from a climate change adaptation perspective the innovations are aimed at meeting the daily challenge of access to water for farming activities such as watering the fields. Through interaction among different capitals (Thulstrup 2015), these innovations can also have positive side effects in terms of women's resilience. A plastic pond that collects waste-water that can be reused in the fields can contributes to increasing the human capital for female farmers, as this saves them time. The increased physical capital of a plastic pond can contribute to strengthening the human capital for the women. This finding shows how climate-friendly interventions in the practical sphere can be targeted to also be positive for women and their daily activities in particular, by targeting their work specifically. If women use less time farming, it can be measured quantitatively as a behavioural change. However, as explored below through the three spheres of transformation (O'Brien and Sygna 2013), the case study shows how these changes which can be placed within the practical sphere can have implications for the political and personal spheres as well, affecting households and perceptions.

Focusing on women as reproduction of sociocultural practices?

Seen through the lens of how our actions produce and reproduce the social structures (Berger & Luckmann 1967), one can argue that the design of the innovations is reproducing the sociocultural practices of a gender division of labour. They are introducing new practices and new solutions, changing how things are normally done in the practical sphere. The political sphere thus turns attention to how the innovations are following the sociocultural structures concerning the internal division of labour in the household. It appears to be an apolitical

technical adjustment that does not conflict with cultural barriers when implemented, and can be understood as acting in accordance with existing beliefs in the personal sphere. Seen through the lens of social constructivism, the fact that the interventions are specifically targeting the social identity of female farmers without challenging the norms and practices of what is considered female work can contribute to keeping these structures in place. If the sociocultural norms and practices are continuously reproduced, it legitimizes what is considered appropriate for the social identities of gender.

The relationship between these innovations and social structures can, however, also be seen from a different perspective. As stated above, a finding from my research was that several informants told me that the interventions made work easier and less time-consuming, which are changes within the practical sphere. However, when speaking with those working on adaptation to climate change there were different views concerning what this additional time could mean. The freedom to have time and to choose what one wanted to do with that extra time, even if that means having time to use on leisure activities, was highlighted as an important aspect in itself (Informant 26, NGO).

However, it was pointed out that a possible positive consequence could be that the extra time could result in more involvement in local politics, and thereby political empowerment and increased social capital for women. The first local elections in over 20 years were held in Nepal during my fieldwork there and during interviews, it was stated that it would be interesting to look closer at whether participants in the project participated more in local politics or not (Informant 25, NGO, Informant 22, NGO). This shows how the innovations in the practical sphere have the potential to create room for empowerment and voices that are raised within the political sphere. This is not necessarily the case, it might not happen and it depends on other factors as well. But in the changing situation of social identities in Nepal or even social transformation as Yadav (2016) terms it, the possibility of freeing time gives room for changing social structures that are constraining for women in the political sphere. This is in line with Huyer (2016) who argues that introducing new technology such as CSA is not neutral for gender relations.

Room for changing sociocultural practices?

> "So men are now interested to participate. Help their women."
>
> (Informant 22, NGO)

Even though the male out-migration was a practical challenge that played an important role for the gender division of work, there was still some room left to navigate in for the sociocultural practices connected to gender. From the NGO baseline report 40 percent of the households had a family member that had out-migrated (Bhatta et al. 2015). There were still men left in the hamlets, and those who migrated to work in the city did not have the longest distance to return home. Many of the houses in the hamlets had extra bedrooms, so they had the possibility of housing household members that were not there all the time. Still, even though the gender division of work was not absolute, I was told that farming still often was the woman's responsibility.

The way the challenge of gender division of work was framed above, the CSA interventions introduced can be considered a practical solution to a practical challenge (O'Brien & Sygna 2013). If the problem is seen as a lack of workforce because of male out-migration, small innovations like these can contribute to an increase of human capital. However, as explained earlier women have traditionally had lower status in the Nepali society. This means that the challenge of female drudgery could also be connected to women's relatively lower status in the Nepali society (Yadav 2016). In these instances, the introduction of new innovations makes room to alter the practices. As one female farmer said:

> "Sometimes my husband helps me plant after I got the tool, because it goes faster now. Everything is becoming so modern."
>
> (Informant 6, Farmer)

As described above, introducing these new technologies and tools did not in itself collide with the sociocultural norms and practices connected to the gender division of labour. However, since the new tools do not have established practices for how they are normally used, implementing them can establish new ways of defining how things are done. This is in line with practice theory, where the activities one does are a part of producing the social structures (Reckwitz 2002). Following this, new technology can contribute to externalizing new practices. For instance, it may become more normal for the man to help out with work that

was earlier considered a woman's job. In time, there is a possibility that it can become a new norm that certain tasks are not tied to a specific gender. If the practice of men helping out with these tools and technologies becomes the norm in the hamlets, it might that men who return after working abroad also take part in this practice when they get back. In this way, the material object of a tool or technology intersect with the reproduction of norms and practices connected to gender identities and can create a room to alter the sociocultural structure of who is supposed to do what (Berger & Luckmann 1967, Huyer 2016). This is in line with Onta and Resurreccion's argument that "adaptation processes are also gendering processes, where particular activities gradually materialise into appropriate roles for women and men" (Onta & Resurreccion 2011, p. 355). This says, however, little concerning whether there are changes going on in the personal sphere. Can the alterations of practices be a part of a broader movement of empowering women? Or will it only be a shift in who does what, with different work tasks added to the women's responsibility?

The transformative lens provided by the three spheres shows how CSA can be understood as technical changes and new practices in the practical sphere (O'Brien & Sygna 2013). The three red arrows going out from the centre shows how there are possibilities that these changes can create room to change norms for gender division of work in the political sphere, or even change assumptions in the personal sphere related to what the different relations can or cannot do. In this way, the implementation of practical changes can destabilise the social structures for the gender division of work (O'Brien & Sygna, 2013). In other words, it can be understood as opening up space in the political and personal spheres as well. However, it is not given that this will happen, it is not deterministic or proven that changes will spread to the political and personal spheres. Potentials must be realized by social actors.

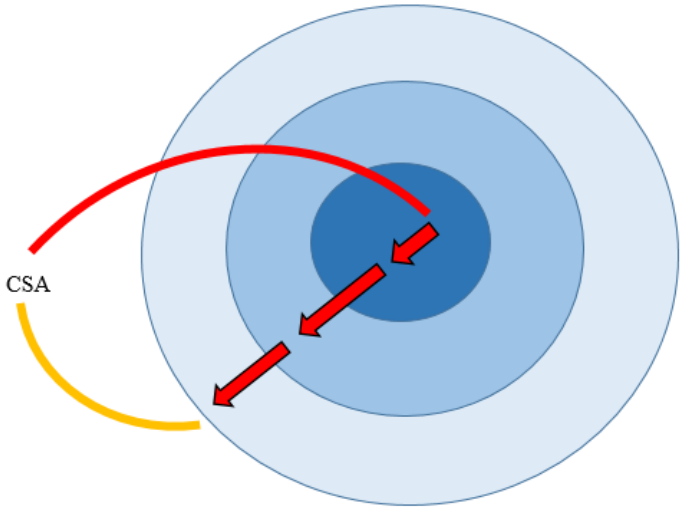

Figure 12: A Transformative Lens on Gender and CSA (Source: O'Brien and Sygna 2013, adjusted by author)

5.3.2 Gender friendly as climate friendly?

For the smaller tools one can argue that gender-friendly interventions have the capacity to be climate-friendly, even though at first glance they are not directly related to either mitigating emissions or adaptation to climate impacts. When analysing it through a livelihood resilience perspective (Thulstrup 2015), the interplay of the different capitals shows how it can be important innovations for climate change adaptation as well. Several farmers pointed out that the tools and technologies speeded up the work and made it more efficient. This led to less time used on farming and caused less wear on the body. By increasing the human capital these small innovations can contribute with increased flexibility with more time available at the household scale, which is an important aspect of resilience. In addition, minimising physical wear on the body increases human capital. In this way, the innovations can contribute to increased resilience at the household scale directly to meet unexpected future events. In other words, women friendly innovations that does not appear as aimed at adapting to climate change and ensuring food security, can through a understanding of connectedness between resilience at different scales be considered climate friendly as well (see Walker and Salt 2006, Thulstrup 2015).

However, does it make sense to consider CSA as an add-on to the other development approaches that work within the current systems and do not address the root causes of vulnerability? Can innovations that do not directly address adaptation or mitigation still be considered climate smart by increasing resilience and flexibility? This perspective could be critiqued for several reasons. First, CSA can be accused of being nothing more than a green add-on to more traditional development, or what Sherman et al. (2016) call technocratic risk management. Second, Neufeldt et al. (2013) critique the concept, pointing out that almost all improved agricultural practices can be considered CSA. Third, the way CSA is implemented does not directly challenge any dominant structures or power hierarchies in the political or personal spheres (see Nagoda & Nightingale 2017).

However, although CSA strategies and innovations are not radical, they are new to the context and situation. In my case study, the CSA intervention alone did not directly challenge the social structures in the political and the personal spheres, and it is not given that implementation will lead to any changes within those spheres. Yet, the changes that are visible within the practical sphere do free women's human capital and open up space for men to contribute to some of the work. My research shows that although flexibility of the concept

is often considered a weakness of CSA (Chandra, McNamara & Dargush 2017, Neufeldt et al. 2013), the flexibility to frame it in ways that are suitable in different places and context may actually be a strength. CSA does not state specifically *how* the sociocultural context needs to be taken into account, but the opportunity to do so is there.

As mentioned in Chapter Three, not all adaptation efforts create positive outcomes for farmers. Eriksen et al. (2011) outline some principles for sustainable adaptation, including the importance of taking local, multiple stressors into account. From the interviews I conducted it was clear that climate change alone was not the sole concern for farmers. There were other challenges facing the farmers, and understanding and including multiple stressors is important to avoid negative unintended consequences of implementing new practices. Targeting multiple stressors opens up a window of opportunity for both agrarian change and social change. Male out-migration and lack of human capital at the farm resulting in female drudgery were rooted in practices of how things are usually done, thus causing challenges for the farmers. These challenges within the practical sphere were addressed simultaneously through the CSA innovations introduced. As I highlighted, culture is dynamic with many nuances, so it is crucial that flexibility is combined with awareness, as the example explored below highlights.

5.4 The Grey-Zone: different understandings of the sociocultural practice of ploughing

As noted earlier, there can be trade-offs between different capitals at different levels. These trade-offs are relevant when it comes to designing and deciding which innovations to introduce as a part of the CSA project, and the introduction of the mini-tractor is an example of this. The mini-tractor was introduced to help with ploughing, a job that has sociocultural norms connected to how it should be done. I was told that women and high caste men should not plough. The mini-tractor would make the work less physically demanding. For households that had a man at home to do the job, the innovation would reduce the human capital used at the household level, and for those renting *majdori,* it would reduce the use of financial capital. Several farmers thought this innovation was challenging to use. One farmer said that if the mini-tractor had been smaller, the work could be done by women (Informant 16, Farmer). In this way it would also help out those families where there were no men available to do the work. For households that otherwise would hire in workforce, using the machine limits use of

financial capital and can help increase the farmer's resilience, in light of Thulstrup's (2015) livelihoods definition of resilience.

However, another understanding of the same case was that it could be negative to introduce an even smaller mini-tractor than the one they had currently. This was because it would open the possibility of transferring what was earlier considered to be a male job into a female job, and thereby increase the women's workload (Informant 2, NGO). In this case, a smaller mini-tractor could decrease the human capital at the household level. This could end up as a negative unintended consequence, if it contributes to further reducing the women's human capital and thereby decreasing their resilience. It becomes clear that how the challenge is framed plays a crucial part in understanding what solutions that are desirable. Which innovation that is chosen problematizes the question of "resilience of what and for whom" (see Cote & Nightingale 2012), and draws attention to the political sphere (see O'Brien & Sygna 2013). There are no easy answer to what the best solution is and it would probably depend on what kind of shocks the system is exposed to. As described above, women's resilience is dependent and a part of the household resilience, but not reducible to it.

This finding is important and it directs attention to the need to consider such possible unintended consequences from the CSA-interventions. The different assets that contribute to resilience can interact in ways that are not obvious. Seen through the three spheres (O'Brien & Sygna 2013), interventions with positive intentions in the practical sphere can lead to unintended consequences in the political sphere. This is important to be aware of to avoid reinforcing existing power hierarchies that marginalize some groups. Nightingale (2011, p. 17) identified the danger of adaptation interventions ending up favoring those that already hold a stronger position in the society. The finding here suggests that this is a challenge to be aware of. However, I nuance the picture by showing that there are both positive and negative connections between individual and household resilience.

The solutions preferred by the farmers are linked to assumptions in the personal sphere of what a women can or cannot do. When I asked why women could not plough, different answers were given. A practical challenge in this regard was that the ploughing of the *khet*-land was needed during a specific time in summer before the monsoon season. Therefore, even though there were some men left in the village they could not do it all by themselves (Informant 16, Farmer), which again points to the lack of human capital. If the farmers do not

have the capacity to use their land, it can become a negative spiral where a lack of human capital further leads to decreased natural and financial capital.

A different answer was that women ploughing was not good for society, or that men ploughing was the traditional way of doing things (Informant 15, Farmer, Informant 22, Farmer). This argument is different from the practical argument concerning a lack of human capital. When the reason behind the practice is that it is not "good for society" or that is "just how the traditions are", this suggests that the sociocultural norm and practice is internalised, reproduced and legitimized (see Berger & Luckmann 1967). It might initially have been rooted in a practical challenge relating to the physical hard work, with the practical solution resulting in men doing that job. Through the process of reproducing the norm through action it can be internalised for some of the actors and thus not challenged (see Berger & Luckmann, 1967). This opens up for exploring interesting aspects of cultural assumptions to be explored.

Different studies have different perspectives on the practice of ploughing. Aase and Chapagain (2018, p. 239) points out that "Ploughing is an exclusively male activity like it is all over Nepal", but they note Laxaas' (2015, p. 65) finding concerning how women can do the ploughing if they use tractors instead of ox. This shows the dynamics when introducing new innovations and the possibility of altering the reproduction of sociocultural norms connected to gender. Nightingale (2017, p. 14) points to the lack of male labour as a reason for why women have begun ploughing some places in Nepal. Based on these different understandings it is clear that there are differences internally and changes underway concerning sociocultural norms and practices within agriculture in Nepal. It will be important when introducing adaptation interventions to pay attention to interactions among the practical, political and personal spheres, and to recognize that these interactions are dynamic and context-specific.

In the table below I give an overview over some of the main findings analysed through Thulstrup's (2015) description of capitals and resilience. The relevance of human capital and gender sharing of work has been investigated in this chapter. The next chapter I will focus on caste, which is connected to social capital.

Figure 13: Table over the five capitals in relation to the case study site

Capital:	Describing:	In the case study area:	Addressed by CSA:
Natural capital	Land areas and natural resources	*Bari*- and *khet*-land, forest, water.	Intercropping and new crop
Physical capital	Infrastructure, technology, materials	Livestock, low level of technology, bus-connection to the city, water access	Plastic pond, plastic house, drip irrigation, tools.
Financial capital	Economic resources	Main income from farming and remittances	The possibility of selling from production
Human capital	Labour force	Characterized by male out-migration and gender division of work	Aiming to reduce female drudgery
Social capital	Social networks, group-membership and social status	Farmer-group, mother-group (also forest-group, male-group, but these are not discussed)	Collaborating with the farmer-group

5.5 Summary

In this chapter I have explored the relationship between sociocultural practices related to gender and adaptation, and potential to increase livelihood resilience. The first finding is that there is a gender-based division of work within agriculture in the case study area, often seen in connection with male out-migration. I explored how male out-migration contributes to resilience and the interplay between the capitals at different scales. The analysis shows how the individual level and the household level are not reducible to each other even though they are strongly connected.

The analysis shows how introduction of CSA-innovations in the practical sphere can be targeted towards what can be considered female work. In this way the innovations may influencing social structures related to gender division of work in the political sphere, without directly challenging them. They can therefore be understood as reproducing the current social structures. However, closer analysis shows that they can actually create room for altering the social structures. The last example of ploughing turns attention to how the sociocultural practices can in some instances be founded in the personal sphere. What are the beliefs about what a women can or cannot do? Is it the physical difference based on biological sex, or is it a

belief of what is good or bad? Differing perceptions on these questions give different solutions spaces for addressing both adaptation and resilience.

6 Caste, gender and resilience

This chapter explores the relationship between planned adaptation for resilience and sociocultural practices connected to caste and gender. As explained in the introduction, the concept of intersectionality highlights how everyone has several different social identities (Valentine 2007) . Based on the existing literature on climate change adaptation in Nepal, I focused my research on gender as well as caste and ethnicity. The intersectionality perspective highlights how social identities overlap, instead of being additive. In other words, this means that studying gender and caste together is different than studying them independently (Cho, Crenshaw & McCall 2013, Valentine 2007). However, I am approaching the study of social identities through sociocultural practices within farming and, as I will show, gender and caste played different roles. There was a significant amount of data on gender as a social identity within farming and adaptation interventions. It was more difficult to get data on caste and ethnicity at the case study site in relation to adaptation interventions. Possible reasons for this were multiple. As discussed in Chapter Four, this might be related to my positionality as a foreigner unfamiliar with the theme, to the fact that my translators were Janajati in their caste-membership or because of my connection with the NGO. Another possibility was that, rather than a direct examination of the dynamics of caste per se, my approach was to examine the topic through sociocultural practices within farming, which may have made it harder to study how the practices of caste played out. I therefore support my findings from the case study site to what informants connected to the NGO told me, and I will examine these findings in relation to secondary sources like Rai (2017), who conducted a case study in a different village in Nepal. Below, I explore the sociocultural norms and practices connected to caste and adaptation.

6.1 Farming as a common activity

> "There is no discrimination when farming. When farming we are all the same."
>
> (Informant 15, Farmer)

When I asked about practices, traditions or norms for caste and ethnicity when farming, I was told that the social groups of caste/ethnicity did not influence farming. However, some traditional practices were mentioned, for example that only the Janajatis and the Dalits were

allowed to have pigs (Informant 6, Farmer), which can be connected to norms in the caste system related to purity and impurity (Rai 2017, p. 113). This finding correspond with Rai (2017) who also identified that there did not seem to be any caste-based discrimination within crop and vegetable farming, but that the keeping and consuming livestock had social norms connected to it.

I also experienced that social capital was important for membership both informal and formal groups when farming. As mentioned in Chapter Five, *parma* is an informal sociocultural practice of working together. It was understood as a practical and effective way of working since the work burden varies with the seasons in farming. In periods with intensive work, cooperation is a strength. I was told that these practices of work-sharing within the hamlets did not follow caste and ethnicity lines, but was rather related to who one's neighbors were (Informant 15, Farmer, Informant 16, Farmer).

However, some of the hamlets I visited were homogenous in relation to caste and ethnic group composition, i.e. all people living in the hamlet belonged to one caste. The limited mix of different groups in the area can have had influence on the answers I found regarding how caste influenced practices in farming. An informant talked about how these forms of collaborating in farming were not only a way of overcoming the challenges of out-migration, but also had other positive qualities like social interaction and tying bonds between households where a member had migrated (Informant 23, NGO). By using one's social capital to get help for work, it can at the same time strengthen the network and social capital for situations where there are unexpected shocks to the system, which is in line with Thulstrup's (2015) understanding of resilience.

The farmer-group was organized in a crosscutting way and as such was not divided along caste and ethnicity divisions. The farmer-groups operate as a membership-based organisation for farmers, who had to pay a certain amount to become a member. The more expensive tools for adaptation were made accessible to the farmer-groups, so that several farmers within the same group could split the expenses and the use of such tools that were usually only sporadically needed across the year. Training for adaptation may also be directed at this level of farmer organization. I was able to observe a training-event in one hamlet. The local contact person for the NGO travelled to a hamlet to show farmers how to install a drip-irrigation system under a plastic house. We worked together in a group with nine other women in one field. When asking about practices and social identities the following day, I

was told that the women participating belonged to different castes, but were in the same farming-group. This example shows how social capital and social networks were important to the farmers, and the various sociocultural practices were connected to this, such as the formal organization of farmer-groups, as well as informal organization of working together by *parma*.

These findings imply that for sociocultural practices within farming, caste is not the most important social marker in the case study area. When looking through the data material, I realised that practices that are not directly related to the role as a farmer can still become relevant in connection to implementing CSA interventions. The findings provide a more nuanced picture of how sociocultural norms and practices connected to different social roles outside farming still have impacts on the possibilities for implementing some of the CSA innovations. The three social fields I identified where different social practices were made relevant included the household (with the gender division of labour mentioned above), the market (with discriminating practices for low-caste), and the hamlet (where spatial practices can limit farmers flexibility).

6.2 Sociocultural practices- Is farming really an exception?

Based on literature, I expected there to be some discriminating practices within farming that would be clearly visible (Onta & Resurreccion 2011). That I did not find this in my data material is an interesting finding in itself. However, as I argue in the sections below, even though the social identity of caste was not found to be challenged through sociocultural practices within farming, low social capital connected to group identity still interacts with adaptation and resilience in meeting climate change in the market and through spatial practices in the hamlet.

6.2.1 Sociocultural practices in the market

> "[The project] have made us into traders. That means we can now make money."
>
> (Informant 7, Farmer)

> *"*People do not want to buy milk sold by a Dalit, because they do not touch it (...) And you know, mentally, psychologically they [Dalit] do not consider that job as their job"
>
> (Informant 2, NGO)

One of three pillars of CSA is food security, which is relevant at both the household level as well as the national level. Several of the farmers pointed out that they had increased production after implementing changes in their farming activities from the projects. This occurred in varying degrees, some said that they no longer had to buy supplementary vegetables, while several others said they were now able to share with relatives or even sell in the market. This indicated that food security has increased at the household level, and if they sell to the market, it increases the food security for those living in the city as well. Increasing natural capital can be translated into financial capital, and this supports food security. This increase of food production was not necessarily due to one single practice, but rather to various practices. Some pointed to how the new practice of intercropping (i.e. planting different crops together) was more efficient as two different types of crop were planted using the same amount of land, which increased productivity and natural capital (Informant 3, NGO). Different ways of intercropping have been introduced as a new CSA practice, as a method to increase yields, and as a way to use the limited space of the terraces better. Another aspect of this practice emphasized that bigger plants could provide shadow or protection from hailstone for smaller plants, and in this way also be more resilient to climate change (Informant 3, NGO). The plastic house was also an innovation that contributed to increasing natural and financial capital, as it opened up the possibility of growing vegetables outside the normal seasons and for growing tomatoes, which also was reported as new for some of the farmers (Informant 17, Farmer).

The second quote above is referring to challenges when upscaling business for Dalit farmers to increase their financial capital. Their social capital marked by belonging to "the untouchable" group in the caste-system can have consequences for possibilities of increasing the financial capital. This is not necessarily in direct connection to the CSA-project at the case study site, and the issue was not discussed with farmers in the area. However, how the social capital of belonging to a low caste group interplays with the possibility of upscaling is an important discussion to look closer and will be discussed later.

6.2.2 Sociocultural practices in the hamlets

"We follow the traditions, but we do not dominate each other"

(Field conversation)

Several groups in the hamlets, both formal and informal, organized the use of resources between people locally. The NGO approached farmers through the farming-group and at the individual level with tools and techniques. A different social group, which was more informal at the level of the hamlet, was the *Aama Samuha,* mother-groups that worked for the betterment of the village (Informant 13, Farmer). The groups have different objectives; the farmer-group is connected to the resource use of natural capital and the mother-group is connected to culture, arranging different community events and collecting money for the betterment of the community. As explained above, some of the hamlets I visited only consisted of people belonging to one caste, but I also visited some hamlets consisting of a mix of two or more groups. In these hamlets, some of the informal social groups were following divisions based on caste and ethnicity, and there are instances where the social identity of caste/ethnicity intersects with practices connected to farming when implementing adaptation measures. In one hamlet the farmer-groups' members were similar to the members of the mothers group, but in a different hamlet the farmers group consisted of three hamlets, with different mother-groups.

These findings show how different social identities give membership access to different social groups. Below is an example that demonstrates how sociocultural practices connected to social identities might have implications for adaptation interventions.

6.1.2.1 Spatial practices and the caste system

There were several occations during my stay in Nepal where my outsider perspective of the caste-system and practices associated with these was expanded. I observed and talked with people about how certain sociocultural practices were followed by members of different caste-groups. An example is how people belonging to a low-caste would not go into certain rooms, like the kitchen, of people belonging to a higher caste. In my observations of this, following the norms and sociocultural practices appeared as a natural thing to do. In field conversations, I was told that discrimination does not have to be connected to conflicts, which differed from my expectation before doing fieldwork. This deepened my understanding of

how the caste-system works. I learned how several things can indicate which caste one belongs to, such as traditions and costumes connected to the different groups, languages spoken, whom to marry and surnames. From what I was told and observed, the spatial practices of purity and impurity were not directly related to farming practices in the fields. However, there are instances where the spatial practices linked to caste can play a role for adaptation in villages with mixed caste-groups collaborating for farming. One instance of this was discussed in relation to whether low-caste members would have access to collective tools in the farmer-group if the tools were kept in houses belonging to higher-caste members. I asked whether it might then be a problem if someone from the low-caste wanted to use any of the tools that were inside a house they did not have access to. When I asked directly about this, I was told that it was not a problem. However, the relationship between spatial practices connected to social identities of caste *can* be considered as affecting resilience, and as reproducing the group identities.

6.2.3 Sociocultural practices affecting resilience

Social capital is one of the aspects affecting livelihoods resilience as explained by Thulstrup (2015). As shown above, social capital was made relevant through the social groups in the hamlet and spatial practices. From a resilience perspective, the spatial practices concerning where you could or could not go can be seen as limiting the flexibility of those belonging to a lower caste regardless of how it connects to the CSA-innovations introduced at the field site. Personal beliefs connected to caste were followed in the spatial sociocultural practices in the hamlet. In the hamlet where I discussed this, it was not considered to be a problem. However, it may be problematic in other places. If resilience is being defined through access and use of the different capitals (Thulstrup 2015), the sociocultural practices and norms connected to caste is limiting the flexibility and gives a lower social capital for those belonging to this group and thereby also affects their resilience.

6.3 A transformative approach to sociocultural practices

The quotes above (p. 81) concerning informal discrimination against Dalits when buying milk illustrate the type of barriers Dalits can face when wanting to upscale production. This resonated with Rai's (2017, 114-119) finding that there was little discrimination within

farming, and also little discrimination clearly visible in commercial spaces. However, through further investigation he also found that there were no Dalits selling tea, as non-Dalits would not be interested in buying it. They could, however, sell milk through a mediator. This information shows the dynamic character and nuances of sociocultural practices and norms. As described earlier, caste-belonging is rooted in old, feudalist structures with a close connection between occupation and caste. The representations of these systems differ a bit in the details ascribed to the different castes. A traditional division was that Brahmins were priests, Chhetris were warriors and Dalits (which in actually is an umbrella term for sub-groups) were considered the occupational caste and untouchables (Subedi 2011, p. 139). I was told people followed the norms connected to occupation less strictly and that these clear divisions are becoming less visible, but it is harder for Dalits than other castes to challenge these structures (Informant 2, NGO).

Resilience in the personal sphere

The challenges of discriminating practices facing Dalits in some aspects (for instance for selling milk or which rooms to enter) can be understood as rooted in beliefs that correspond to the personal sphere. This relates to the pure/impure distinction which traditionally states that food and drinks touched by a Dalit was "polluted" and could not be consumed by a non-Dalit (Subedi 2011). As described above, caste membership is inherited from birth (Pariyar & Lovett 2016). Using the concepts from Berger and Luckmann (1967), this becomes a part of the in-group and out-group dynamics, and is passed on as objective knowledge about the way the world is and works, which then becomes taken as 'natural' or as a given. The quote about Dalits having trouble upscaling illustrates how social identity is made relevant by others ascribing it to them, but also how it can be a social identity that they ascribe to themselves as a static status. Moving outside that identity would not only runs counter to what a person has internalized as a norm, but would also run counter to what the social expectations are, and thus doubly difficult to overcome. Here, the circular reproduction between agents and structures are visible.

Growing up with the caste system, it can become naturalized and the roles internalized, such that it becomes a part one's identity (see Berger & Luckmann 1967). As such, it would make sense that lower caste members' lack of access to the building in which the tools for CSA were located was not perceived by a problem by local people. To be able to

challenge the discrimination, rather than remaining subject to the roles instituted by caste, the caste system itself would have to be examined as an "object", something that is possible to look "at" rather than "through" – recognizing that it is not a natural part of how " is just is" (Kegan & Lahey 2009). This is in line with Nightingale's (2011) findings on how this social identity is internalised and not questioned for some in Nepal. She points to a conversation where she was told by a Dalit man that he himself felt uncomfortable to touch someone from an upper class, as untouchability was a practice he had learned to follow (Nightingale 2011). Caste can thus be deeply rooted in the personal sphere in a belief-system or as assumptions about what is true in the world.

Attention to how these beliefs are rooted in the personal sphere highlight important aspects for adaptation. Interventions directed towards challenges rooted in the personal sphere are complicated and delicate when they are deeply embedded in people. As O'Brien and Sygna (2013, p. 7–8) argue transformation within the personal sphere should not be forced upon from the outside, as that would be manipulation or indoctrination. This adds complexity to the challenges of implementing adaptation measures. Is it possible to separate the traditions and languages of the different groups from the hierarchical, oppressing structures of the caste-system? And can this be done without oppressing other members of society? These questions are out of the scope of this thesis to investigate. What I try to highlight here is rather the importance of understanding how sociocultural norms and practices relate to adaptation interventions. In this case, beliefs about purity and impurity in the personal sphere play out as sociocultural norms within the political sphere that structure behavior and actions in the practical sphere.

The sociocultural norm of not buying drinks from a Dalit can prevents Dalits from going into that occupation, which in turn leads to not challenging the norm, but instead reproducing it. This created an identity that can both be internalized, as well ascribed by other non-Dalits. Upscaling a business can therefore be more risky for Dalits; although it does require financial investment, the greater challenge would be the sociocultural one. If there is a practice with a normative dimension connected to how people often do not want to buy your products, it will be a big risk to upscale. Avoiding this is hard, if not impossible because where you choose to buy your groceries is a private decision. This provides challenges for Dalits in scaling up production, especially related to food and diary-products. The social role as a farmer intersects with the social role as belonging to a group that have been discriminated

against historically and in many informal ways still are (Nightingale 2011, Jones & Boyd 2011, Nagoda & Nightingale 2011). It is possible to adapt to some extent by increasing production, but only to a certain limit and not further. Here, the capitals are influencing each other negatively; a lack of social capital and status makes it harder to gain financial capital (see Thulstrup 2015).

Seen through a transformative lens, as illustrated in Figure 14, the CSA innovations implemented do have implications in the practical sphere (red arrow), but they do not directly affect the social structures and norms connected to caste in the political sphere, or the assumptions and beliefs regarding caste and purity/impurity in the personal sphere. I have illustrated resilient beliefs and social norms as two yellow arrows that can be understood as creating barriers for changing sociocultural practices, norms and assumptions in the three spheres. However, this understaning of the relation between climate change adaptation and caste is not neccesarily supporting an argument to target caste directly, as I will explore below.

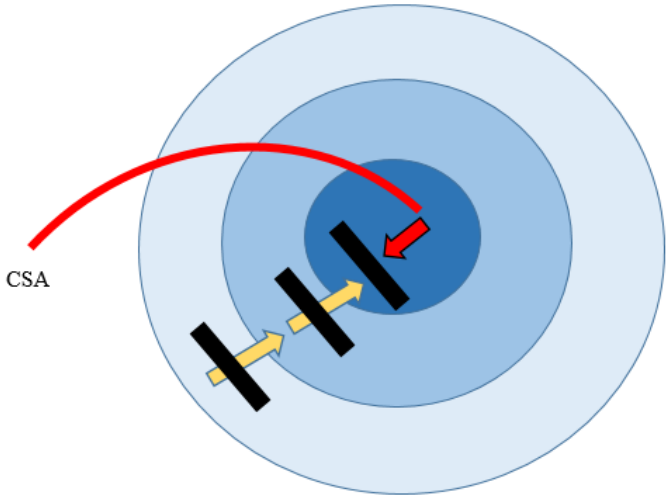

Figure 14: A Transformative Lens on Caste and CSA (Source: O'Brien and Sygna 2013, adjusted by author)

6.4 The challenge of targeting caste in adaptation

As described above, the social identity connected to caste can be considered as functioning as limiting farmer belonging to a low caste's social capital and thereby limiting their resilience. One question based on this is then, does this affect CSA-innovations? As described above, I did not find practices within farming that were based on caste-membership in relation to CSA. An important point raised by one informant was that if one were to target the social identity of caste in the same way as done with gender it could lead to discontent within the village for those that were not approached (Informant 23, NGO). To consider this point in connection to Berger and Luckmann's (1967) theory of social construction of society, the role of CSA in addressing this may be questioned. Seen through a social constructivist approach with a focus on practice theory (Reckwitz 2002), approaching a group based on caste can be considered as

contributing to reproducing the social identity, legitimizing its existence and play a role in keeping it alive. In this way the sociocultural norms and the way they are acted out can continue to be naturalized, instead of providing room to question the social identity of caste altogether. I was told that some of the ways in which interventions could target marginalized groups was through economical support (Informant 1, NGO). This approach can be understood as translating the social identity of "low-caste" into "poor" and rather approaching the latter social identity. The two identities can in many instances be overlapping, but they do not have to be. As explored below, a society where there are some parts of the culture that are changing and others that might seem more resilient, awerness concerning consequences from implementing new practices is important.

6.4.1 The importance of the political sphere

The law in Nepal makes it illegal to discriminate based on caste (World Bank 2006). Still, findings show how sociocultural norms and practices can play out subtly and informally. The consequences of these practical actions are a part of reproducing the discriminating hierarchical caste-system. However, several informants also told me that there are changes happening in cultural norms in Nepal and different sources for these changes where pointed out. Some pointed to out-migration not only as a challenge, but also as a possible opportunity with increased globalisation as a source of new information and that the people that returned bring with them new knowledge and understandings on how things can be done (Informant 23, NGO, Informant 25, NGO).

Technological changes, such as televisions and phones becoming more available, were also pointed to as possible reasons (Informant 1, NGO). Globalisation with longer travels and new ICT-technology can challenge embedded sociocultural norms by exposing people to new ways of doing things, which in turn can lead to questioning some of the things that have been internalized and naturalized by growing up in a certain cultural context. Seeing how it is different in other places can start a process of asking questions and maybe even alter the norms one acts in accordance with.

The insurgence was also highlighted in conversations as one factor that can have contributed to speeding up social changes. Sociocultural practices connected to gender and caste were directly challenged during this period. I was told that there were differences internally in the country on how sociocultural norms played out and one of the divisions was

between the cities versus more rural villages. In one conversation, my informant mentioned that it would be okay for the person to have a Dalit-friend come visit and go into the kitchen in the city, but the same person would not have challenged the structures when visiting grandparents in a rural village.

Even though it may seem from the discussion describing the social structures that they work as clear barriers, reducing resilience and as difficult to address by CSA, information from field conversations and the interviews with people connected to the NGO showed that there is an understanding that changes are happening. One aspect discussed in light of the local elections that were going on during my fieldwork, was how there are implemented laws and regulations to include discriminated groups formally (Braithwaite 2015), and rules forms systems in the political sphere (O'Brien and Sygna 2013). However, the data material show how changes implemented in the political sphere does not necessarily influence beliefs in the personal sphere, or that it takes time. Several of the informants at the NGO-level explained how there are changes occurring regarding discriminating sociocultural practices, which correspond with Yadav's (2016) study. However, some of the literature in the field shows how the power relations still can be considered resilient (Braithwaite, 2015). The changes in the personal sphere was be understood as partial, and happening through different dynamics and at varying speeds in different places and between age-groups.

My interpretation is that while it might be hard to address these dynamic changes for norms and practices connected to caste directly through the practical implementation of adaptation interventions, it will in any case be important to be aware of whether or not they are reproducing and supporting old hierarchical power relations. In this way, increasing resilience in the farming system needs to be aware of how it related to resilience of beliefs connected to caste.

6.5 Contributions of a transformative lens

In the discussions above, I first analyzed gender through a transformative lens, and then explored caste through the same perspective. There are different sociocultural practices identified, and studying them by the help of O'Brien and Sygna's (2013) three spheres of transformation reveals that there are different dynamics of resilience and change in the different spheres. Below, I bring together the findings to highlight how an intersectional

approach is relevant in the cases described as one-dimensional above. I further discuss the contribution of a transformative lens, and how it adds to the resilience literature.

6.5.1 The intersection of caste and gender

In Chapter Five I looked at social identities of gender and discussed it at the household level, where a household belong to the same caste. In this chapter, looking closer at caste, the examples of sociocultural norms in the hamlet and the market can be understood as an intersection of caste and gender. Farmers, belonging to the lower-caste and often being female, have less human and social capital. The lack of human capital can be addressed directly, but the negative social capital is not as easy to address.

An example is how Bahttarai et al.'s (2015) research show that gender plays a role in the market. Bhattari et al.'s (2015) case study (also from the Kaski district in Nepal) shows how increasing food production leads to women getting more work to do, but they do not necessarily have control over financials and decisions. This perspective was not brought up as a challenge during my interviews. I was rather told about the importance of household and collective decisions in field conversations. Still, an informant mentioned the importance of including the head of the household, who often is the oldest man, when implementing adaptation (Informant 24, NGO). This was despite it often being a younger female who was responsible for the practical implementation. Another interpretation of the gender dimensions concerning access to financial capital, was that a small increase in income would not be important, thus the women could have control of that (Informant 2, NGO). This shows the dynamic of culture and power, where there can be variations among cases in similar areas.

The separation between the social identities of caste and gender, the way I have done it in this thesis can be critiqued from the perspective of intersectionality, where they should be considered in direct connection. However, when comparing the findings for the two social identities below I show that they play out differently and that a nuanced approach of each one is important.

6.5.2 Differences between caste and gender when adapting

My analysis shows that even though women and Dalits can be considered less resilient in some instances due to sociocultural practices, there are differences in which sociocultural

practices they are challenged by and the consequences this has when implementing adaptation interventions. I therefor start with a short recap of the findings above.

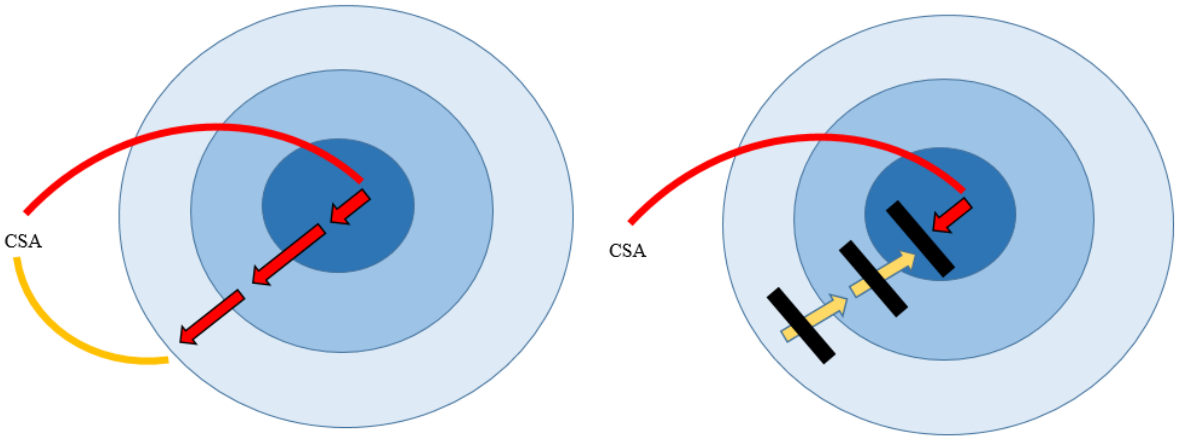

Figure 15: Illustrating the different relationships between gender and CSA (to the left), and caste and CSA (to the right). (Source: O'Brien and Sygna 2013, adjusted by author)

The two figures illustrates the interactions between CSA-innovations and social identities. For gender, the practice of gender division of work was to a large degree seen in connection to male out-migration. The challenge of lack of human capital for female farmers can be understood as a challenge in the practical sphere. The tools interventions can be targeted at work that is considered the women's responsibility. This can create space for weakening the structures and norms in the political sphere. This can create new beliefs and assumptions of what the genders can and cannot do in the personal sphere. The yellow arrow illustrates the possibility of the cultural assumptions, norms and practices as influencing the development and implementation of CSA.

The second figure illustrates the same relationship for caste. The challenge of purity/impurity connected to low caste can be understood as founded in the personal sphere and being resilient to change. This can appear as barriers for change in the personal, political and practical spheres for culture, and that the CSA intervention do not have direct consequences for low-castes social position. There is no yellow arrow symbolizing the influence of caste on development of CSA, while it can contribute to reproducing the current power relations and belief and assumptions discriminating low-caste people. However, as these illustrations might seem static, I have tried to convey that they are dynamic and

nuanced, and that there are room for changes in all the three spheres- but that some aspects might be more resilient to change than others.

Comparing how the two social identities relates to the sociocultural practices connected to CSA shows that they are differently affected. The way I have analyzed the data, the biggest challenge for low-caste people is located in the personal sphere, made relevant through norms and acted out as practices. For gender, the challenge of male out-migration can be considered more practical. An example is the case of getting water, which was considered a woman's responsibility, but which I observed being done by a man. The observation does not mean that it is incorrect when told that getting water normally is considered a woman's responsibility. It suggests that not following the practice does not necessarily lead to social sanctioning, and it might not have a clear normative dimension to it. To use the concepts offered by the three spheres, it does not break with the beliefs of what a man can or cannot do if he contributes by getting water. Sociocultural practices and norms presented are not absolute or deterministic. Ploughing appeared as a challenge in the personal sphere for one, but as a practical challenge for another.

Based on the discussion and findings in this thesis, I argue that sociocultural practices connected to social identities plays out in different ways when adapting to climate change and that there is a need to recognize this when implementing adaptation measures. Based on the case study I argue that CSA innovations to increase resilience within farming communities can contribute to ongoing transformations within the personal and political spheres for some social identities, yet may be limited for others. O'Brien & Sygna's (2013) three spheres of transformation provides a foundation to speak of how there is a two-way relationship between sociocultural practices and climate change adaptation interventions for resilience, and how they are affecting each other mutually.

Westley et al. (2002) highlight how social systems have characteristics that are different from ecological systems. In this case study I have shown that humans are not a homogenous group. This case study shows how O'Brien and Sygna's (2013) three spheres of transformation is used to study sociocultural practices in socioecological systems that influence livelihood resilience. The practical and political spheres highlight how the sociocultural practices affects resilience and can affect which CSA-interventions that are implemented. This is a way of situating resilience and opening up what sometimes can appear as a "box"- releasing humans from being considered a homogenous category to providing a

nuanced picture on the role of social relationships (see Cote & Nightingale 2012). The interplay between the practical and political spheres shows how practical changes can result in trade-offs or unintended consequences. However, adding the personal sphere gives yet another layer for interpreting differences between the challenges groups face, and how they intersect.

6.5.3 Resilience or transformation?

Adaptation, resilience, transition, transformation or transformational adaptation are all concepts of change, and several papers talks about the breadth, depth, scale and scope of change to differentiate between them (Fazey et al. 2017, Few et al. 2017; Kates, Travis, & Wilbanks 2012). In the introduction I highlighted the distinction between exploring change descriptively or prescriptively, and this thesis has set out to explore a transformative lens on resilience. So what type of change was triggered by the adaptation interventions at the case study site? Whether a change is transformational or incremental can be considered a subjective and relative dependent on the researcher (Fazey et al. 2017, p. 2).

FAO writes in a news story about a CSA project in Nepal that: "This is part of the climate-smart and sustainable agriculture approach that helps *transform* agriculture into *resilient systems* that effectively support development and ensure food security in the face of a changing climate." (Thapa 2018, my italics). The concepts of transformation and resilience are both used to describe goals for change. Transformation within agriculture can be understood to refer to the changes in the practical sphere. To use the three spheres as a framework (O'Brien & Sygna 2013), to change a crop is an action that can be located within the practical sphere, but it does not say anything concerning the political or personal spheres. It can be transformative within one sphere, but have little impact on other dimensions such as power relations or cultural beliefs. This case study shows that there is a need to specify in which sphere resilience is being discussed, and distinguish between socioecological resilience and sociocultural resilience, and still see them as connected.

Pelling (2011, p. 55) argues that neither resilience nor transformation are inherently good in themselves, but he is skeptical towards promoting resilience in empirical settings where it does not challenge the deeper structures. The findings in this case study suggest that enhancing resilience in the farming system to meet unpredictable future challenges from climate change or other stressors within the practical sphere does not necessarily mean that

one are arguing for resilience within the political and personal sphere as well. In fact, there are possibilities that resilience within the practical sphere, even when targeted in a way fitting to the social context, can weaken the social structures and existing power relations in the political and personal sphere (O'Brien & Sygna 2013).

Looked at through the transformative lens of the three spheres (O'Brien & Sygna 2013), this study shows how CSA does not in itself emphasize all the three spheres, but favors the practical sphere while the political and personal sphere is more dependent on the context and implementation. However, there is a risk that CSA might lose the flexibility that makes it possible to adjust it to the local setting if it is promoted as a concept at the international level, without considering the local context. What this thesis shows is the importance of acknowledging changes in all of the three spheres, not just the practical sphere, and paying attention to how implementation can affect different social identities in different ways. In this case study, internationally promoted CSA-strategies are suited to the local context by flexibility in the implementation.

Resilience theory do not include these nuances and the deeper dimension of the personal sphere. Even a more situated and social approach, like Cote and Nightingale (2012) and Brown (2014) calls for, including the political sphere and existing power relations, does not necessarily take in to account how these social structures are founded in the personal sphere. The intersectional approach applied in this thesis contributes by highlighting how gender and caste, can be seen as important categories within the political sphere. My understanding is that the combination of the practical and political spheres is the approach used by several of the researchers critically studying Nepal and adaptation to climate change (see Nagoda & Nightingale 2017, Nightingale 2017, Sapkota et al. 2016). However, the transformative lens on resilience give room to investigate how sociocultural norms and practices are constructed and dynamic. The three spheres reveal both the barriers and possibilities associated with CSA practices. The findings from this thesis suggests that there can be differences between the solution space for how gender and caste can be approached through interventions, and it nuances the picture of the social identities and sociocultural practices.

6.6 Further research

To use functionalist systems to describe relations between elements leads to the problem of setting boundaries (Leach 2010, Olsson et al. 2015). The particular system is socially constructed by the boundaries set by the framework and not apolitical or naturally given. The social identity I had set out as a starting point for sampling participants was farmer, and I limited my informants to farmers participating in the project and NGO workers, but I discovered when working with the theme that this framing had certain blind spots.

The focus of my study meant that I did not speak to the workers without land who were dependent on income from agriculture by getting financial capital by contributing with their labour force through the *majdori.* Still, it is important to mention how there can be trade-offs where an increase in the resilience of farmers in this study contributes to more vulnerability for other groups, like landless if their workforce are no longer used. Adhiferf (1995, p. 28-31) uses the term *occupational caste* to describe what is often referred to as Dalits today, and links this to how they were not allowed to own land in the past since they were to serve people from higher castes. In his results, the occupational cast (Dalits) clearly have a higher percent of income from waged labour compared to the other households, since they do not own much land themselves. I have discussed ploughing above as a job that had certain beliefs connected to it, and that several farmers told me they rented in workforce to plough. If improved agricultural practices means that the farmers do not have to rent in workforce any more, this can have negative consequences for what might be an even more marginalized group. Since this was outside the scope of my paper, I highlight it as an interesting area for future research. Generally, this case study represents an initial exploration where I have identified some relationships, but it also raises new questions. How are the returned migrants affecting the farming? What about women that out-migrate, and what are their roles in this story? Will the practical changes and potentials identified for social change end up actually changing the norms and beliefs about social identities of gender? A comparative case study of implementation of CSA in different places, or even in different countries with a focus on culture could also provide useful information to ensure conscious implementation of planned adaptation.

6.7 Summary

In this chapter I have explored the relationship between sociocultural practices related to caste, gender and adaptation to increase resilience. Both gender and caste can be considered exhaustive social identities in the Nepali context (Pariyar & Lovett 2016), and they play out differently when seen in connection to farming. I did not identify sociocultural practices within the activity of farming directly connected to caste-membership. However, I identified sociocultural practices through spatial norms in the hamlet and norms connected to group identity in the market which can be relevant for resilience and CSA in particular.

The analysis started from the personal sphere, identifying how beliefs connected to purity/impurity creates norms and social structures in the political sphere, both as objective structure that is followed in society and internalized as subjective structures for the low-caste person. In this way, social capital and sociocultural practices connected to caste can create barriers for increasing resilience through adaptation interventions. I analyzed why targeting the social identity of caste when implementing adaptation interventions could contribute to reproducing and legitimizing a social identity with a low social capital. The practices, norms and beliefs about caste seemed be dynamic in some instance and not in others. The analysis shows that it is important that adaptation interventions do not reproducing old practices for caste, and how increasing resilience to meet unforeseen challenges in the farming system should at the same time increase resilience of the social system of caste.

Further, the difference between gender and adaptation, and caste and adaptation shows how they in this case study can be understood as playing out in different settings and thereby provide different rooms for how they can be approached. Using a transformative perspective of the three spheres blurs the line between resilience and transformation, showing how they can work together in different aspects of change processes.

7 Conclusion:

This thesis has answered the question: *How can a transformative lens on resilience contribute to understand climate change adaptation in farming communities?* I have approached the question by exploring how a CSA project interacted with sociocultural practices connected to social identities. I have done a qualitative case study in Kaski located in the mid-hills region of Nepal, a country characterised by a lot of internal diversity as well as being highly vulnerable to climate change. Adaptation to climate change was narrowed down to focus explicitly on CSA, a set of strategies advocated internationally to contribute to food security, adaptation and mitigation. By defining adaptation in a broad sense (see Pelling 2011), as changes made in light of climate change, the theory of resilience in coupled socioecological system was used to explore how the relationship between sociocultural practices and adaptation played out. The research was anchored locally by approaching a Nepali NGO for collaboration and the possibility to study their CSA project.

The findings of the research nuance understanding of the relationship between transformation and resilience. By employing what I term a transformative lens on resilience, inspired by O'Brien and Sygnas (2013) three spheres of transformation, I show that cultural resilience can play out in all three spheres. The analysis shows how resilience can be a strength in some instances, like household resilience against an unpredicted shocks, or that resilience in beliefs in the personal sphere and norms in the political sphere connected to social identities actually contributes to weakening social capital and resilience for farming in the practical sphere. The transformative lens adds dimensions to the resilience approach who traditionally has a focus on the practical sphere, highlighting that norms and social structures are important for practical innovations, as well as the beliefs and assumptions these norms are based on.

7.1 Revisiting the research questions

Even though I wanted to employ an intersectional analysis, I decided to split up the overarching question by first exploring gender. The first research question was therefore:

a) *What is the relationship between sociocultural practices connected to gender and climate change adaptation and resilience?*

My findings suggests that certain sociocultural practices connected to gender do affect planned adaptation for resilience at the case study site. The gender sharing of work at the household level was the practice easiest to identify and was closely related to the practice of male out-migration. Women are regarded as mainly responsible for several activities related to farming. This has consequence for the adaptation intervention, while it makes it possible to target women's work tasks. By enhancing the adaptive capacity for female farmers by increasing their human capital it can provide opportunities for further empowerment. However, possible trade-offs between resilience at different levels, like the household level and the individual level were also identified. This shows the importance of awareness when adapting, and that there is likely to be subjective considerations attached to which capitals at what level that is important to enhance.

However, the possibility of targeting gender work can be seen in relation to the flexibility of how the Climate Smart Strategies are implemented. The approach have flexibility to target proximate stressors as well as distant stressors such as climate change, which is in line with one of the requirements for sustainable adaptation. However, this draws attention to how the livelihoods resilience concept as described by Tanner (2015), might be difficult to separate from development approaches focusing on livelihoods in general. Is that positive and includes the underling processes driving vulnerability or is it a way of co-opting climate change adaptation into development? This is an interesting area for future research.

A social constructivist approach to the social identities provides room to explore how adding new technologies, materials and practices to increase resilience can affect practices connected to social identities. One way of exploring the relationship is to approach targeting social roles as reproducing them. However, a focus on practices connected to farming and changing those highlights that reducing female workload can be understood as opening up room for other activities. Another possibility found was that the introduction of new technology can open spaces for changing what was earlier considered a woman's job to also be done by a man. This is not to say that these changes have already happened or that they necessarily will, but the information I gathered in the field shows that there can at least be created room for it.

b) *What is the difference between sociocultural practices connected to caste and gender when adapting towards resilience?*

When looking at caste and ethnicity, or even the intersection of caste, ethnicity and gender the picture got more nuanced. The perspective showed the importance of social capital, and how farming as an activity are considered as an area crossing group-boundaries that were relevant in other social settings. However, climate change adaptation can lead to other situations where access to tools or possibilities for upscaling can be relevant. In these instances, the impression is that practices connected to caste and ethnicity might work as barriers that decreases the persons adaptive capacity.

The findings for caste are different. Certain sociocultural practices appeared more as a barrier for adaptation and can affect the resilience of those belonging to lower castes. This social identity was not directly targeted from the innovations implemented. However, this it not to say that targeting the groups directly will be a better idea. The theory of social reproductions shows how it can be a way of further legitimizing a group identity with negative connotations. Practices connected to caste are anchored in the personal sphere and beliefs about purity and impurity, and is anchored in a different way that practices connected to gender. Even though several of the practices identified was at the intersection of caste and gender, while gender in other research-projects has been identified as important when upscaling in the market, the different social identities are made relevant in different social situations and not easily approached at the same time by the adaptation innovations explored. The case study suggests how the social identities are not additive, but works according to different logics, and this can suggest that they should be approached in different ways when adapting.

It was identified a possible two-way relationship between gender and adaptation. The social practices connected to different identities affected the interventions implemented. At the same time, the interventions introduced provides room for new practices to emerge, and can contribute to a change in norms and practices that are already going on in Nepal. Even through the innovations in the practical sphere are aiming at increasing resilience in the socioecological system to be more prepared for an uncertain future with climate change, this does not necessarily mean that they at the same time reinforce the current dominant structures in the political sphere. In this case study it appears as being differences between how the differing social identities plays out and that this leads to different solution space for how they can be approached. With flexibility in implementation as well as awareness towards the threat

of trade-offs innovations to increase resilience can contribute to ongoing transformations within the personal sphere for some social identities, but serve as a barrier for others.

7.2 Connecting to the bigger picture

After conducting a case study that for outsiders might seem much focused and limited, it is important to ask oneself the questions: So what? Why does this matter? The research represents a case study and is not generalizable. The relationships identified might not be true in other parts of Nepal or even for everyone at the case study site. However, the intent of this research was to explore how CSA translated to a specific social context. By using a transformative perspective on resilience I have explored how and why sociocultural practices matter. Even though the caste system is special for Nepal and the gender division of labour is not replicated in other places, the need to emphasize sociocultural practices and social structures will be important in any place where one is implementing adaptation interventions.

By differentiating between socioecological resilience and sociocultural resilience, I show that adaptation can lead to resilience to climate change while also opening spaces for social change, for example, by decreasing the sociocultural resilience of gender roles. This case study suggests that sociocultural dynamics are important to take into consideration when adapting, but there is no blueprint on how to do this. How we change and reproduce ourselves in light of climate change, will be influenced by and influence social relations in society. The narrative of this thesis is presented through technical concepts and an academic language. However, the essence is this; climate change is affecting our basis for life and livelihoods. How we interact and meet these challenges is shaping the future we will meet.

Reference list

Aase, T. H. & Chapagain, P. S. 2017. Organic Farmers on the Ridge: The Hyolmo of Sermathang, Nepal. In: Aase, T. H (Eds.). *Climate Change and the Future of Himalayan Farming* (1 edition, p. 229-266) Oxford University Press, India.

Adger, W. N. 2006. Vulnerability. *Global Environmental Change*, 16, 3. 268–281. https://doi.org/10.1016/j.gloenvcha.2006.02.006

Adhikari, J. 1995. *ETHNICITY, OFF-FARM INCOME AND RESOURCE USE IN THE SEMISUBSISTENCE FARMING SYSTEM OF KASKI DISTRICT, NEPAL* (Doctoral Thesis). Australian National University, Australia.

Bailey, C., White, C., & Pain, R. 1999. Evaluating qualitative research: dealing with the tension between "science" and "creativity." *Area*, 31, 2. 169–178. https://doi.org/10.1111/j.1475-4762.1999.tb00182.x

Bassett, T. J., & Fogelman, C. 2013. Déjà vu or something new? The adaptation concept in the climate change literature. *Geoforum*, 48, 42–53. https://doi.org/10.1016/j.geoforum.2013.04.010

Baxter, J. 2010. Case studies in Qualitative Research. In I. Hay (Eds.), *Qualitative Research Methods in Human Geography* (3 edition, p. 81–97). Oxford University Press, New York

Bradshaw, M. & Stratford, E. 2010. Qualitative Research and Rigour. In I. Hay (Eds.), *Qualitative Research Methods in Human Geography* (3 edition, p. 69-80). Oxford University Press, New York.

Bee, B. A. 2016. Power, perception, and adaptation: Exploring gender and social–environmental risk perception in northern Guanajuato, Mexico. *Geoforum*, 69, 71–80. https://doi.org/10.1016/j.geoforum.2015.12.006

Bennett, L. 2002. *Dangerous Wives and Sacred Sisters. Social and Symbolic Roles of High-Caste Women in Nepal* (2nd edition). Mandala Publications, Nepal

Berger, P. L., & Luckmann, T. 1967. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. Anchor, New York

Bhatta, K. P., K. Thapa, P. Chaudhary, R. B. Rana, A. Khattri-Chhetri, D. Rijal, and D. Gurung. 2016. Scaling up Climate Smart Agriculture in Nepal – Identification and Piloting Methodology Report. Local Initiatives for Biodiversity, Research, and Development (LI-BIRD) and The Consultative Group for International Agricultural Research's (CGIAR) Research Program on Climate Change, Agriculture, and Food Security (CCAFS), Kaski, Nepal.

Bhatta, K. P., K. Thapa, S. Gautam, A. Khattri-Chhetri, P. Chaudhary, R. B. Rana, B. Dhakal, K. D. Gurung, and B. Bhattarai. 2015. Scaling-up Climate Smart Agriculture in Nepal-Village Baseline Report. Local Initiatives for Biodiversity, Research, and Development (LI-BIRD) and The Consultative Group for International Agricultural Research's (CGIAR) Research Program on Climate Change, Agriculture, and Food Security (CCAFS), Kaski, Nepal.

Bhattarai, B., Beilin, R., & Ford, R. 2015. Gender, Agrobiodiversity, and Climate Change: A Study of Adaptation Practices in the Nepal Himalayas. *World Development*, 70. 122–132. https://doi.org/10.1016/j.worlddev.2015.01.003

Bista, D. B. N. 2004. *People of Nepal.* (Edt. 2004, originally 1967) Dept. of Publicity, Ministry of Information and Broadcasting, His Majesty's Govt. of Nepal.

Blaikie, N. 2007. *Approaches to Social Enquiry: Advancing Knowledge*. (2 edition) Polity Press, Malden

Braithwaite, J. B. 2015. *Gender, Class, Resilient Power: Nepal Lessons in Transformation* (SSRN Scholarly Paper No. ID 2685495). Rochester, NY: Social Science Research Network. Retrieved from: https://papers.ssrn.com/abstract=2685495 [Accessed: 20.5.2018]

Brown, K. 2014. Global environmental change I: A social turn for resilience? *Progress in Human Geography*, 38, 1. 107–117. https://doi.org/10.1177/0309132513498837

Burningham, K., & Cooper, G. 1999. Being Constructive: Social Constructionism and the Environment. *Sociology*, 33, 2. 297–316. https://doi.org/10.1177/S0038038599000280

Butler, J. 2003. The Question of Social Transformation. In E. Beck-Gernsheim & L. Puigvert, J. Vaida (Trans.), *Women and Social Transformation*. (p. 1-28) Peter Lang Inc., International Academic Publishers, New York

Butler, J. 2004. *Undoing Gender.* Routledge, London.

Chandra, A., McNamara, K. E., & Dargusch, P. 2017. Climate-smart agriculture: perspectives and framings. *Climate Policy*, 1–16. https://doi.org/10.1080/14693062.2017.1316968

Chapagain, B., & Gentle, P. 2015. Withdrawing from agrarian livelihoods: Environmental migration in Nepal. *Journal of Mountain Science*, 12, 1. 1–13. https://doi.org/10.1007/s11629-014-3017-1

Cho, S., Crenshaw, K. W., & McCall, L. 2013. Toward a Field of Intersectionality Studies: Theory, Applications, and Praxis. *Signs*, 38, 4. 785–810. https://doi.org/10.1086/669608

Christensen, A.-D., & Jensen, S. Q. 2012. Doing Intersectional Analysis: Methodological Implications for Qualitative Research. *NORA - Nordic Journal of Feminist and Gender Research*, 20, 2. 109–125. https://doi.org/10.1080/08038740.2012.673505

Cloke, P., Cook, I., Crang, P., Goodwin, M., & Painter, J. 2004. Talking to people. In *Practising Human Geography* (1 edition, p. 123–168). Thousand Oaks, Calif: SAGE Publications Ltd, London

Cote, M., & Nightingale, A. J. 2012. Resilience thinking meets social theory: Situating social change in socio-ecological systems (SES) research. *Progress in Human Geography*, 36, 4. 475–489. https://doi.org/10.1177/0309132511425708

Dalby, S. 2016. Framing the Anthropocene: The good, the bad and the ugly. *The Anthropocene Review*, 3, 1. 33–51.

Djoudi, H., Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Sijapati, B. B. 2016. Beyond dichotomies: Gender and intersecting inequalities in climate change studies. *Ambio*, 45, 3 248–262. https://doi.org/10.1007/s13280-016-0825-2

Dugmore, A. J., Keller, C., McGovern, T. H., Casley, A., & Smairowski. 2010. Norse Greenland settlement and limits to adaptation. In W. N. Adger, D. I. Lorenzoni, & K. L. O'Brien (Eds.), *Adapting to Climate Change: Thresholds, Values, Governance* (p. 96–113). Cambridge University Press, Cambridge.

Dunn, K. 2010. Interviewing. In I. Hay (Eds.), *Qualitative Research Methods in Human Geography* (3 edition, p. 81–97). Oxford University Press, Oxford.

England, K. V. 1994. Getting personal: Reflexivity, positionality, and feminist research. *The Professional Geographer*, 46, 1. 80–89.

Eriksen, S., Aldunce, P., Bahinipati, C. S., Martins, R. D., Molefe, J. I., Nhemachena, C., O'Brien, K., Olorunfemi, F., Park, J., Sygna, L. & Ulsrud, K. 2011. When not every response to climate change is a good one: Identifying principles for sustainable adaptation. *Climate and Development*, 3, 1. 7–20. https://doi.org/10.3763/cdev.2010.0060

Eriksen, S., & Brown, K. 2011. Sustainable adaptation to climate change. *Climate and Development*, 3, 1. 3–6. https://doi.org/10.3763/cdev.2010.0064
Fangen, K. 2010. *Deltagende observasjon* (2nd ed.). Fagbokforlaget, Bergen.
FAO. 2017. *The future of food and agriculture: trends and challenges*. Food and Agriculture Organization of the United Nations, Rome.
FAO. n.d.. Climate-Smart Agriculture. *FAO Homepage*. Retrieved from http://www.fao.org/climate-smart-agriculture/en/ [Accessed: 20.5.2018]
Fazey, I., Moug, P., Allen, S., Beckmann, K., Blackwood, D., Bonaventura, M., Burnett, K., Danson, M., Falconer, R., Gagnon, A.S., Harkness, R., Hodgson, A., Holm, L., Irvine, K.N., Low, R., Lyon, C., Moss, A., Moran, C., Naylor, L., O'Brien, K., Russell, S., Skerratt, S., Rao-Williams, J. & Wolstenholme, R. 2017. Transformation in a changing climate: a research agenda. *Climate and Development*. Retrieved from http://www.tandfonline.com/doi/citedby/10.1080/17565529.2017.1301864?scroll=top&needAccess=true
Feola, G. 2015. Societal transformation in response to global environmental change: A review of emerging concepts. *Ambio*, 44, 5. 376–390. https://doi.org/10.1007/s13280-014-0582-z
Few, R., Morchain, D., Spear, D., Mensah, A., & Bendapudi, R. 2017. Transformation, adaptation and development: relating concepts to practice. *Palgrave Communications*, 3, 17092. https://doi.org/10.1057/palcomms.2017.92
Flood, R. L. 2010. The Relationship of "Systems Thinking" to Action Research. *Systemic Practice and Action Research*, 23, 4. 269–284. https://doi.org/10.1007/s11213-010-9169-1
Folke, C., Carpenter, S., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. 2010. Resilience Thinking: Integrating Resilience, Adaptability and Transformability. *Ecology and Society*, 15, 4. https://doi.org/10.5751/ES-03610-150420
Geels, F. W. 2009. Foundational ontologies and multi-paradigm analysis, applied to the socio-technical transition from mixed farming to intensive pig husbandry (1930–1980). *Technology Analysis & Strategic Management*, 21, 7. 805–832. https://doi.org/10.1080/09537320903182280
George, A. L., & Bennett, A. 2005. *Case Studies and Theory Development in the Social Sciences*. MIT Press.
Gerring, J. 2004. What Is a Case Study and What Is It Good for? *The American Political Science Review*, 98, 2. 341–354.
Gillard, R., Gouldson, A., Paavola, J., & Van Alstine, J. 2016. Transformational responses to climate change: beyond a systems perspective of social change in mitigation and adaptation. *Wiley Interdisciplinary Reviews: Climate Change*, 7, 2. 251–265. https://doi.org/10.1002/wcc.384
Haas, H. de. 2012. The Migration and Development Pendulum: A Critical View on Research and Policy. *International Migration*, 50, 3. 8–25. https://doi.org/10.1111/j.1468-2435.2012.00755.x
Hackfort, S., & Burchardt, H.-J. 2016. Analyzing socio-ecological transformations – a relational approach to gender and climate adaptation. *Critical Policy Studies*, 1–18. https://doi.org/10.1080/19460171.2016.1191363
Hammersley, M., & Atkinson, P. 2007. Fieldrelations. In: Hammersley, M., & Atkinson, P. Ethnography: Principles in Practice (1 edition, p. 63-96). Routledge, London.

Head, L. 2010. Cultural ecology: adaptation - retrofitting a concept? *Progress in Human Geography*, 34, 2. 234–242. https://doi.org/10.1177/0309132509338978

Hodgson, G. M. 2006. What are institutions. *Journal of Economic Issues*, 40, 1.

Høiland, H. 2016. *Resistance Through Knowledge, Nature and Worldview. Aboriginal resistance against the Enbridge Northern Gateway Pipeline in British Columbia Canada* (Master thesis). University of Oslo, Oslo, Norway.

Holling, C. S., & Gunderson, L. H. 2002. Resilience and adaptive cycles. In L. H. Gunderson & C. S. Holling (Eds.), *Panarchy: understanding transformations in human and natural systems*. (p. 25-62) Island Press, Washington, DC.

Holling, C. S., Gunderson, L. H., & Ludwig, D. 2002. In quest of a Theory of Adaptive Change. In L. H. Gunderson & C. S. Holling (Eds.), *Panarchy: understanding transformations in human and natural systems*. (p. 3-22) Island Press. Washington, DC

Holling, C. S., Gunderson, L. H., & Peterson, G. D. 2002. Sustainability and Panarchies. In C. S. Holling & L. H. Gunderson (Eds.), *Panarchy: Understanding Transformations in Human and Natural Systems* (p. 63–102). Island Press, Washington, DC.

Holmelin, N., & Aase, T. H. 2013. Flexibility of Scope, Type and Temporality in Mustang, Nepal. Opportunities for Adaptation in a Farming System Facing Climatic and Market Uncertainty. *Sustainability*, 5, 4. 1387–1405. https://doi.org/10.3390/su5041387

Howitt, R., & Stevens, S. 2010. Cross-Cultural Research: Ethics, Methods, and Relationships. In I. Hay (Eds.), *Qualitative Research Methods in Human Geography* (3 edition, p. 40–68). Oxford University Press, New York.

Huyer, S. 2016. Closing the Gender Gap in Agriculture. *Gender, Technology and Development*, 20, 2. 105–116. https://doi.org/10.1177/0971852416643872

Ifejika Speranza, C., Wiesmann, U., & Rist, S. 2014. An indicator framework for assessing livelihood resilience in the context of social–ecological dynamics. *Global Environmental Change*, 28, 109–119. https://doi.org/10.1016/j.gloenvcha.2014.06.005

IPCC 2007. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. Retrieved from: https://www.ipcc.ch/publications_and_data/ar4/wg2/en/annexessglossary-a-d.html [Accessed: 20.5.2018]

IPCC 2012. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp. Retrieved from: http://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf [Accessed: 20.5.2018]

IPCC 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp. Retrieved from: https://www.ipcc.ch/report/ar5/syr/ [Accessed: 20.5.2018]

Jones, L., & Boyd, E. 2011. Exploring social barriers to adaptation: Insights from Western Nepal. *Global Environmental Change*, 21, 4. 1262–1274. https://doi.org/10.1016/j.gloenvcha.2011.06.002

Jost, C., Kyazze, F., Naab, J., Neelormi, S., Kinyangi, J., Zougmore, R., Aggarwal, P., Bhatta, G., Chaudhury, M., Tapio-Bistrom, M.-L., Nelson, S. & Kristjanson, P. 2016. Understanding gender dimensions of agriculture and climate change in smallholder farming communities. *Climate and Development*, 8, 2. 133–144. https://doi.org/10.1080/17565529.2015.1050978

Kates, R. W., Travis, W. R., & Wilbanks, T. J. 2012. Transformational adaptation when incremental adaptations to climate change are insufficient. *Proceedings of the National Academy of Sciences*, 109, 19. 7156–7161. https://doi.org/10.1073/pnas.1115521109

Kathmandu Post. 2017. *Floods claim 57 lives across country*. Retrieved from: https://kathmandupost.ekantipur.com/news/2017-08-14/floods-claim-57-lives-across-country.html [Accessed: 20.5.2018]

Kathmandu post. 2018. Woman dies in "menstruation hut." Retrieved from: http://kathmandupost.ekantipur.com/news/2018-01-08/woman-dies-in-menstruation-hut.html [Accessed: 20.5.2018]

Kegan, R., & Lahey, L. L. (2009). Reconceiving the Challenge of Change. In *Immunity to Change: How to Overcome It and Unlock the Potential in Yourself and Your Organization* (pp. 11–30). Boston, Mass: Immunity to Change: How to Overcome It and Unlock the Potential in Yourself and Your Organization.

Laxaa, G. 2015. *Feminization of Agriculture in Melamchi, Nepal? Addressing gender in agricultural production and household decisions* (Master Thesis). University of Bergen, Bergen, Norway. Retrieved from: http://bora.uib.no/bitstream/handle/1956/9938/133480403.pdf?sequence=1&isAllowed=y [Accessed 22.05.2018]

LI-BIRD. (2016). *Annual Report 2014/2015* (pp. 1–34). Pokhara, Nepal: LI-BIRD.

Mainali, J., & Pricope, N. G. (2017). High-resolution spatial assessment of population vulnerability to climate change in Nepal. *Applied Geography*, *82*, 66–82. https://doi.org/10.1016/j.apgeog.2017.03.008

Martinez-Baron, D., Orjuela, G., Renzoni, G., Loboguerrero Rodríguez, A. M., & Prager, S. D. 2018. Small-scale farmers in a 1.5°C future: The importance of local social dynamics as an enabling factor for implementation and scaling of climate-smart agriculture. *Current Opinion in Environmental Sustainability*, 31. 112–119. https://doi.org/10.1016/j.cosust.2018.02.013

Mercy Corps. 2018. Quick facts: What you need to know about the Nepal Earthquake. Retrieved from https://www.mercycorps.org/articles/nepal/quick-facts-what-you-need-know-about-nepal-earthquake [Accessed: 3.5.2018]

Ministry of Population and Environment. 2016. *Intended Nationally Determined Contribution (INDC)*. Government of Nepal. Retrieved from: http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Nepal/1/Nepal_INDC_08Feb_2016.pdf [Accessed: 20.5.2018]

Nagoda, S., & Nightingale, A. J. 2017. Participation and Power in Climate Change Adaptation Policies: Vulnerability in Food Security Programs in Nepal. *World Development*, 100, 85–93. https://doi.org/10.1016/j.worlddev.2017.07.022

Nelson, D. R., Adger, W. N., & Brown, K. 2007. Adaptation to Environmental Change: Contributions of a Resilience Framework. *Annual Review of Environment and Resources*, 32, 1. 395–419. https://doi.org/10.1146/annurev.energy.32.051807.090348

Neufeldt, H., Jahn, M., Campbell, B. M., Beddington, J. R., DeClerck, F., Pinto, A. D., Gulledge, J., Hellin, J., Herrero, M., Jarvis, A., LeZaks, D., Meinke, H., Rosenstock, T., Scholes, M., Scholes, R., Vermeulen, S., Wollenberg, E., & Zougmoré, R. 2013. Beyond climate-smart agriculture: toward safe operating spaces for global food systems. *Agriculture & Food Security*, 2, 12. 1-6 https://doi.org/10.1186/2048-7010-2-12

Nightingale, A. J. 2011. Bounding difference: Intersectionality and the material production of gender, caste, class and environment in Nepal. *Geoforum*, 42, 2. 153–162. https://doi.org/10.1016/j.geoforum.2010.03.004

Nightingale, A. J. 2015. A socionature approach to adaptation. In: Inderberg, T. H., Eriksen, S., O'Brien, K. & Sygna, L. 2015. *Climate change adaptation and development: Transforming paradigms and practices*. (p. 219-234), Routledge, London

Nightingale, A. J. 2017. Power and politics in climate change adaptation efforts: Struggles over authority and recognition in the context of political instability. *Geoforum*, 84, 11–20. https://doi.org/10.1016/j.geoforum.2017.05.011

O'Brien, K., & Sygna, L. 2013. Responding to climate change: The three spheres of transformation. In *Proceedings of Transformation in a Changing Climate* (p. 16–23). University of Oslo, Oslo.

O'Brien, K. 2015. Adaptation: **C**ombining **O**ld and **N**ew k**N**owledge to **E**nable **C**onscious **T**ransformations to **S**ustainability (AdaptationCONNECTS). Research proposal. University of Oslo, Oslo.

O'Brien, K. 2018. Is the 1.5°C target possible? Exploring the three spheres of transformation. *Current Opinion in Environmental Sustainability*, 31, 153–160. https://doi.org/10.1016/j.cosust.2018.04.010

O'Brien, K., Sygna, L., Datchoua, A., Pettersen, S., & Rada, R. 2018. Transformations in socio-ecological systems. In: EEA Report No 25/2017 (p. 28–34). European Environmental Agency. Retrieved from: https://www.eea.europa.eu/publications/perspectives-on-transitions-to-sustainability [Accessed: 20.5.2018]

Olsson, L., Jerneck, A., Thoren, H., Persson, J., & O'Byrne, D. 2015. Why resilience is unappealing to social science: Theoretical and empirical investigations of the scientific use of resilience. *Science Advances*, 1, 4. https://doi.org/10.1126/sciadv.1400217

Olsson, P., Galaz, V., & Boonstra, W. 2014. Sustainability transformations: a resilience perspective. *Ecology and Society*, 19, 4. https://doi.org/10.5751/ES-06799-190401

Onta, N., & Resurreccion, B. P. 2011. The Role of Gender and Caste in Climate Adaptation Strategies in Nepal. *Mountain Research and Development*, 31, 4. 351–356. https://doi.org/10.1659/MRD-JOURNAL-D-10-00085.1

Pariyar, B., & Lovett, J. C. 2016. Dalit identity in urban Pokhara, Nepal. *Geoforum*, 75. 134–147. https://doi.org/10.1016/j.geoforum.2016.07.006

Patton, M. Q. 2002. Qualitative interviewing. In: Patton, M. Q. *Qualitative Research & Evaluation Methods* (pp. 339–426). SAGE.

Paudel, K. P., Tamang, S., & Shrestha, K. K. 2014. Transforming land and livelihood: Analysis of agricultural land abandonment in the Mid Hills of Nepal. *Journal of Forest and Livelihood*, 12, 1. 11–19.

Pelling, M. 2011. *Adaptation to climate change: from resilience to transformation*. Routledge, London.

Ragin, C. C. 1992. Casing and the process of social inquiry. In C. C. Ragin & H. S. Becker, *What Is a Case?: Exploring the Foundations of Social Inquiry* (p. 217–226). Cambridge University Press.

Ragin, C. C., & Amoroso, L. M. 2011. *Constructing Social Research: The Unity and Diversity of Method* (2 edition).SAGE Publications, Inc., Los Angeles.

Rai, M. 2017. *Enduring inequalities: Practices of caste and development in new Nepal* (PhD Thesis). Austrailian National University, Australia. Retrieved from: https://openresearch-repository.anu.edu.au/handle/1885/131775 [Accessed: 20.5.2018]

Reckwitz, A. 2002. Toward a Theory of Social Practices A Development in Culturalist Theorizing. *European Journal of Social Theory*, 5, 2. 243–263. https://doi.org/10.1177/13684310222225432

Resilience Alliance. n.d.-a. Resilienace Alliance -Adaptive Cycle. Homepage. Retrieved from: https://www.resalliance.org/adaptive-cycle [Accessed: 18.4.2018]

Resilience Alliance. n.d.-b. Resilience Alliance - Resilience. Homepage. Retrieved from: https://www.resalliance.org/resilience [Accessed: 18.4.2018]

Rosenstock, T. S., Lamanna, C., Chesterman, S., Bell, P., Arslan, A., Richards, M., Rioux, J., Akinleye, A.O., Champalle, C., Chang, Z., Corner-Doloff, C., Dohn, J., English, W., Eyrich, A.S., Girvetz, E. H., Kerr, A., Lizarazo, M., Madalinska, A., McFatridge, S., Morris, K.S., Namoi, N., Poultouchidou, N., Ravina, S.M., Rayess, S., Ström, H., Tully, K.L. & Zhou, W. 2016. *The scientific basis of climate-smart agriculture: A systematic review protocol* (Working Paper). Retrieved from: https://cgspace.cgiar.org/handle/10568/70967 [Accessed: 20.5.2018]

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., Lenton, T. M., Scheffer, M., Folke, C., Schellnuber, H. J., Nykvist, B., de Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R.W., Fabry, V. J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P. & Foley, J. A. 2009. A safe operating space for humanity. *Nature*, 461, 7263. 472–475. https://doi.org/10.1038/461472a

Saaghus, A. 2016. *From flooding to formalization: A case study of the informal settlement of Green Park, Cape Town* (Master's Thesis). University of Oslo, Oslo, Norway.

Saldaña, J. 2009. An introduction to codes and coding. In: Saldaña, J. 2009. *The coding manual for qualitative researchers*. (p. 1-32). Sage, London

Sapkota, P., Keenan, R. J., Paschen, J.-A., & Ojha, H. R. 2016. Social production of vulnerability to climate change in the rural middle hills of Nepal. *Journal of Rural Studies*, 48, 53–64. https://doi.org/10.1016/j.jrurstud.2016.09.007

Scoones, I. 2009. Livelihoods perspectives and rural development. *The Journal of Peasant Studies*, 36, 1. 171–196. https://doi.org/10.1080/03066150902820503

Shah, S. H., Angeles, L. C., & Harris, L. M. 2017. Worlding the Intangibility of Resilience: The Case of Rice Farmers and Water-Related Risk in the Philippines. *World Development*, 98, 400–412. https://doi.org/10.1016/j.worlddev.2017.05.004

Sherman, M., Berrang-Ford, L., Lwasa, S., Ford, J., Namanya, D. B., Llanos-Cuentas, A., … IHACC Research Team. 2016. Drawing the line between adaptation and development: a systematic literature review of planned adaptation in developing countries. *Wiley Interdisciplinary Reviews: Climate Change*, 7, 5. 707–726. https://doi.org/10.1002/wcc.416

Shields, S. A. 2008. Gender: An Intersectionality Perspective. *Sex Roles*, 59, 5–6. 301–311. https://doi.org/10.1007/s11199-008-9501-8

Shove, E. 2010. Beyond the ABC: Climate Change Policy and Theories of Social Change. *Environment and Planning A*, 42, 6. 1273–1285. https://doi.org/10.1068/a42282
Sismondo, S. 1993. Some Social Constructions. *Social Studies of Science*, 23, 3. 515–553. https://doi.org/10.1177/0306312793023003004
Steenwerth, K. L., Hodson, A. K., Bloom, A. J., Carter, M. R., Cattaneo, A., Chartres, C. J., Hatfield, J.L., Henry, K., Hopmans, J.W., Horwath, W. R., Jenkins, B. M., Kebreab, E., Leemans, R., Lipper, L., Lubell, M. N., Msangi, S., Prabhu, R., Reynolds, M. P., Solis, S. S., Sischo, W. M., Springborn, M., Tittonell, P., Wheeler, S. M., Vermeulen, S. J., Wollenberg, E. K., Jarvis, L. S., & Jackson, L. E. 2014. Climate-smart agriculture global research agenda: scientific basis for action. *Agriculture & Food Security*, 3, 11. 1-39 https://doi.org/10.1186/2048-7010-3-11
Subedi, M. 2011. Caste system: Theories and practices in Nepal. *Himalayan Journal of Sociology and Anthropology*, 4, 134–159.
Surtiari, G. A. K., Djalante, R., Setiadi, N. J., & Garschagen, M. 2017. Culture and Community Resilience to Flooding: Case Study of the Urban Coastal Community in Jakarta. In R. Djalante, M. Garschagen, F. Thomalla, & R. Shaw (Eds.), *Disaster Risk Reduction in Indonesia* (p. 469–493). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-54466-3_19
Tanner, T., Lewis, D., Wrathall, D., Bronen, R., Cradock-Henry, N., Huq, S., Lawless, C., Nawrotzki, R., Prasad, V., Rahman, M.A., Alaniz, A., King, K., McNamara, K., Nadiruzzaman, M., Henly-Shapard, S. & Thomalla, F. 2015. Livelihood resilience in the face of climate change. *Nature Climate Change*, 5, 1. 23–26. https://doi.org/10.1038/nclimate2431
Taylor, M. 2015. *The Political Ecology of Climate Change Adaptation: Livelihoods, Agrarian Change and the Conflicts of Development*. Routledge, New York.
Taylor, M. 2017. Climate-smart agriculture: what is it good for? *The Journal of Peasant Studies*, 1–19. https://doi.org/10.1080/03066150.2017.1312355
Thapa, A. 2018. *Great hopes for climate-smart farming*. FAO Homepage. Retrieved from: http://www.fao.org/fao-stories/article/en/c/1095455/ [Accessed: 24.5.2018]
Thomas, G. 2013. *How to Do Your Research Project* (2 edition). Sage Publications Ltd, Los Angeles.
Thompson-Hall, M., Carr, E. R., & Pascual, U. 2016. Enhancing and expanding intersectional research for climate change adaptation in agrarian settings. *Ambio*, 45, 3. 373–382. https://doi.org/10.1007/s13280-016-0827-0
Thorén, H., & Olsson, L. 2017. Is resilience a normative concept? *Resilience*, 1–17. https://doi.org/10.1080/21693293.2017.1406842
Thulstrup, A. W. 2015. Livelihood Resilience and Adaptive Capacity: Tracing Changes in Household Access to Capital in Central Vietnam. *World Development, 74*, 352–362. https://doi.org/10.1016/j.worlddev.2015.05.019
Tissier, J., & Grosclaude, J.-Y. 2016. What About Climate-Smart Agriculture? In E. Torquebiau (Ed.), *Climate Change and Agriculture Worldwide* (p. 313–324). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-017-7462-8_24
UN Nepal Information Platform. n.d.. Map Centre-Nepal: Administrative Unit - State 4 Map. Retrieved from http://un.org.np/resources/maps [Accessed: 20.5.2018]
UNFCCC. 2015. Paris Agreement. Presented at the 21st Conference of the Parties, Paris: United Nations. Retrieved from http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf [Accessed: 20.5.2018]

Valentine, G. 2007. Theorizing and Researching Intersectionality: A Challenge for Feminist Geography*. *The Professional Geographer*, 59, 1. 10–21. https://doi.org/10.1111/j.1467-9272.2007.00587.x

Vandernoot, J., & Hove, C. V. 2014. Disparities between Development Regions and District Development Committees in Nepal. *International Advances in Economic Research*, 20, 3. 353–354. https://doi.org/10.1007/s11294-014-9479-7

Vera, H. 2016. Rebuilding a classic: The social construction of reality at 50. *Cultural Sociology*, 10, 1. 3–20.

Walker, B., Holling, C. S., Carpenter, S., & Kinzig, A. 2004. Resilience, Adaptability and Transformability in Social–ecological Systems. *Ecology and Society*, 9, 2. https://doi.org/10.5751/ES-00650-090205

Walker, B., & Salt, D. 2006. *Resilience Thinking: Sustaining Ecosystems and People in a Changing World*. Washington, DC: Island Press.

Westley, F., Carpenter, S. R., Steven, R., Brock, W. A., Holling, C. S., & Gunderson, L. H. 2002. Why Systems of People and Nature are Not Just Social and Ecological Systems. In L. H. Gunderson & C. S. Holling (Eds.), *Panarchy: understanding transformations in human and natural systems* (pp. 103–119). Washington, DC: Island Press.

Whelpton, J. 2005. *A History of Nepal*. Cambridge: Cambridge University Press.

World Bank. 2006. *Unequal citizens : gender, caste and ethnic exclusion in Nepal : Summary (English)*. World Bank, Washington, DC. Retrieved from http://documents.worldbank.org/curated/en/201971468061735968/Summary [Accessed: 20.5.2018]

Yadav, P. 2016. *Social Transformation in Post-conflict Nepal: A Gender Perspective* (1 edition). Routledge, New York.

Appendix I: Revised questionnaire to farmers

Tell about the informed consent, who I am, how to get in contact etc.

1. Could you tell me briefly about your household?
    a. Follow up on male migration: Many males are migrating from this area, why do you think that is?

2. What are the importance of informal groups like mother groups in this village? (Different groups to talk about: Ama Soumah,, Youth club, Farmer-group, village council)
    a. How are these groups structured?
    b. What is the role of caste?
    c. The role of gender?
    d. Who makes decisions?

3. How is the work shared?
    a. In you household?
    b. In the village? (Different practices: Parma, Huri, Majdori)
    c. Do people own or rent land in the village?
    d. How is the work shared between the genders generally?

4. Project:
    a. How did you hear about it?
    b. What changes did you make? Small tools, big tools, knowledge
    c. When did you make these changes?
    d. What was your motivation for making the changes?
    e. What has changed?
        i. Challenges?
        ii. Possibilities?
5. What are the connections between the local groups (discussed in question 2) and the project?
6. What is the connection between the local groups and farming?

End the interview by asking if they have questions for me, wondering anything, want to add anything more.

Appendix II: Informed consent

Request for participation in research project "Cultural Aspects of Adapting to Climate Change"

My name is Ann Kristin Schorre and I am a masters student in Human Geography at the Department of Sociology and Human Geography at the University of Oslo in Norway. The purpose of this fieldwork is to gather data about cultural aspects connected to adaptation to climate change for small-scale farmers in Nepal to use in my masters thesis. The goal of the thesis is to get a better understanding on what key stakeholders in an adaptation project perceive to be limits and possibilities in the local cultural setting for the adaption of the project, with a focus on traditions, gender roles and practices. The master thesis is in cooperation with the AdaptationCONNECTS project at the Department of Sociology and Human Geography at the University of Oslo and with a Nepali NGO called LI-BIRD.
I would like to interview key stakeholders in a LI-BIRD adaptation project, both people working for the NGO centrally, locally and farmers participating in adaptation projects. The interview is expected to last about one hour and I will use an audio recorder and take notes during the interview. The interviews will take place during May/June 2017. Questions will concern motivations and objectives for participating in the adaptation project, how it has affected traditional practices and daily life.

The data collected from the interviews will be anonymous, unless otherwise agreed upon. However, your identity may be recognized due to the affiliation with the project. The transcribed interviews will not be coded with the participants names. The information will be stored in my personal Dropbox account and locally on my personal password protected computer.

The thesis is scheduled to be completed by May 2018, and it will be published on the University of Oslo's webpage and shared with LI-BIRD. The data may be used for a paper with others working for AdaptationCONNECTS and co-written with LI-BIRD staff and this will be settled within six-months after the thesis is finished. All personal data collected will be deleted after this process is over and only the anonymized interviews will be kept.
I hope you have the opportunity to participate and share your perspectives and knowledge on this theme with me. It is voluntary to participate in the project, and you can choose to withdraw your consent at any time. If you decide to withdraw, the information you have given will be deleted and not be used in any of the work.

If you have any questions concerning the project, please contact me on a.k.schorre@sosgeo.uio.no or telephone XX. In May/June 2017 you can contact me on my Nepali telephone: XXX. You can also contact my supervisor, Professor Karen O'Brien at the Department for Sociology and Human Geography, University of Oslo on karen.obrien@sosgeo.uio.no.

The study has been notified to the Data Protection Official for Research, NSD - Norwegian Centre for Research Data.

Appendix III: Informants

Informants:	Relation to the project:	Where:
Informant 1	NGO	Kathmandu
Informant 2	NGO	Pokhara
Informant 3	NGO	Hamlet 1
Informant 4	NGO	Hamlet 1
Informant 5	Farmer	Hamlet 2
Informant 6	Farmer	Hamlet 1
Informant 7	Farmer	Hamlet 1
Informant 8	Farmer	Hamlet 2
Informant 9	Farmer	Hamlet 3
Informant 10	Farmer	Hamlet 3
Informant 11	Farmer	Hamlet 3
Informant 12	Farmer	Hamlet 4
Informant 13	Farmer	Hamlet 4
Informant 14	Farmer	Hamlet 4
Informant 15	Farmer	Hamlet 5
Informant 16	Farmer	Hamlet 2
Informant 17	Farmer	Hamlet 2
Informant 18	Farmer	Hamlet 3
Informant 19	Farmer	Hamlet 6
Informant 20	Farmer	Hamlet 6
Informant 21	Farmer	Hamlet 6
Informant 22	NGO	Kathmandu
Informant 23	NGO	Pokhara
Informant 24	NGO	Pokhara
Informant 25	NGO	Pokhara
Informant 26	NGO	Kathmandu
Informant 27	NGO	Kathmandu