Challenging current approaches to climate change adaptation

A study of climate change adaptation in El Salvador

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Chapter 1 Introduction

Future climate change and adaptation

“Are you making preparations in your countries to tell your industries and households what it means to adapt to a four-degree change and have you made estimates of what these costs are that will be borne by the public sector and households?”

(Artur Runge-Metzger, EU Chief Climate Negotiator, March 14, 2011)

“The world is on track for four degrees Celsius of global warming under current carbon emission trends”, stated the EU’s chief climate negotiator, speaking at a roundtable hosted in Brussels on March 14th 2011 (Neslen 2012). The London-based Royal Society report (Warren 2011) found that with planetary warming of four degrees or more, half the world’s current agricultural land will become unusable, sea levels will rise by up to two meters, and around 40% of the world’s species will become extinct (Warren 2011). It is, however, impossible to now know or even predict the exact impacts of this kind of change. The Royal Society Report concluded, however, that the limits for human and environmental adaptation are likely to be exceeded in many parts of the world.

Climate change is one of the most challenging and complex problems facing humanity, and will have significant consequences for human development and security in years to come. Actions of adaptation and mitigation, like learning to cope with living in an insecure world while drastically reducing greenhouse gas emissions, will require transformations at a rate and scale that have yet to be seen in human history (O’Brien & Hochachka 2010). Climate change adaptation is both a necessary and urgent response to a changing climate (Adger 2007, O’Brien 2009). It is also a process that happens regardless of people ever having heard a political statement or an academic word about it. Human beings are an adaptable species, but adaptation is not synonymous with smooth transition or change, and the complexity of the process makes it hard to operationalize a definition of it (Nelson 2009). One challenge is that adaptation happens in different ways in different places, resulting in different local outcomes of a global phenomenon. Living with a changing climate and adapting to it means living with increasing uncertainties and having to deal with consequences tied to complex and often invisible causal relationships. It can also be hard to separate the terms coping, which refers to aiming for short-term stability and adapting, which refers to the necessary longer term changes (Nelson 2009). What is certain is that climate changes affect normal people in their complex everyday lives in contexts of different risks and challenges (Pelling 2011).
Adaptation to climate change consists of initiatives and measures that aim to reduce vulnerability to the consequences of climate change in different sectors and social-ecological systems. Today’s climate change adaptation policies focus on increasing efficiency and optimizing the parts of sectors and social-ecological systems that can provide concrete economic results. This approach does not necessarily promote long-term sustainability, since the debate is reduced to “who should pay” with focus on climate quotas, different definitions of sustainability and green economy (UNEP 2012). The people who are most vulnerable to the effects of climate change are often forgotten or neglected. They are the world’s poorest, living with a high degree of insecurity even without the added stress of having to adapt to climate change. The results of today's policies and theories on adaptation to climate change are that large parts of the world’s population end up having to struggle for survival instead of living decent lives (Walker & Salt 2006).

The dominant climate change discourse describes a situation where human beings stand on the edge of catastrophe (Holling 2001, Lovelock 2009). The effect of such an apocalyptic description will often paralyze actions in situations where urgency in response would be the preferred alternative (Nelson 2009). A missing part of that apocalyptic representation is human agency and people’s capacity to live with changes and adapt to new situations (Holling 2001). Strategies of adaptation are often implemented and used by local people to deal with urgent problems in their immediate surroundings. Sometimes such strategies come from outside the local community, from NGOs or the state, influenced by international policies. Other times the strategies come from within the local community, and even when plans come from the outside, it is local people in a specific context who have to implement the adaptation plans. Factors such as people’s own knowledge, resources and innovations will then affect the processes. Climate change adaptation is more than an individual process; it can even be a political tool for action (Pelling 2011). Climate change policy has for some time focused on mitigation in order to help save human beings from the foreseen catastrophic results of climate change like temperature rise, ocean level rise, and stronger and more unpredictable natural disasters (Marland et al 2003). Mitigation can also be seen as a type of adaptation that will benefit future generations as well as our own because it can reduce the need for other types of adaptation (O’Brien 2009). Pelling (2011) argues that as climate change proceeds and mitigation policies fail the potential for dangerous climate change increases. He further argues that adaptation thus must be a political tool equal to mitigation, and that adaptation should be used in a wider sense than just as a measure to cope with vulnerability. Without
transformational adaptation undertaken with some measure of planning and inclusivity, dangerous climate change might force uncontrolled and more anarchic forms of transformation onto communities and societies (Pelling 2011). Seeing adaptation as political action requires looking at climate change adaptation from an individual level, as well as focusing on social-ecological systems (Hukkinen 2008). Internationally, the difficulties in creating global environmental policies are visible; locally, people struggle to deal with the impacts of climate change. Systems, institutions, politics and markets often appear to be large and uncontrollable, but they are all composed of individuals, and individuals have the potential to act, to manage and to change.

Research question

This thesis explores alternative ways of approaching climate change adaptation, and considers what an alternative approach to adaptation can look like in practice. Such a focus could contribute to the development of long-term solutions and sustainability in the interactions between human society and ecology. Through an analysis of what can enable constructive action in a challenging situation, this thesis will address the non-tangible aspects of climate change adaptation and explore how they influence community adaptation. This thesis addresses the question: “How can climate change adaptation processes connect better with local realities and engage people as subjects of change, capable of influencing their own future?” To answer this question, three sub-questions will be explored:

1. How can connecting with local realities in an adaptation process be realized in practice?
2. What factors fosters agency and engagement with climate change adaptation in local communities?
3. How are the experiences from investigating climate change adaptation in a specific local context relevant for dealing with climate change in other local communities as well as on a global level?

The thesis attempts to understand how people in El Salvador deal with climate change in their everyday lives and how people’s interactions with nature (interactions in socio-ecological systems) affect both society and ecology. El Salvador is one of the most vulnerable countries to local consequences of climate change both ecologically and socially (Hochachka 2005). This research approach recognizes that adaptation will not always have the intended effect, and humans trying to control nature could result in other consequences than desired.
Moreover, all human actions that affect nature and society are influenced by people’s values, subjective experiences, ideas and behaviour. At the same time that climate is affecting people who have to adapt; human actions are in turn affecting the climate system. Consequently, adaptation as acts that sustain the very systems that perpetuate climate change must be questioned (Freire 1999). How to approach climate change adaptation to really build a sustainable future is thus becoming an increasingly important issue. Through finding new and broader approaches to climate change adaptation it might be possible to promote action and attitudes that could enhance capacity to meet climate change with adaptation measures that are constructive for both societies and ecology, as connected parts of one whole system.

Disposition of the thesis

The analysis and answers to this research question is based on a field work carried out in collaboration with the Salvadoran NGO, Centro Bartolome de las Casas (CBC), through a study that approach climate change by focusing on the subjective sides of adaptation and climate change. Data material was collected in two local communities. The thesis will start with a background chapter describing the context of why it is important and useful to study climate change in El Salvador. The theoretical foundation used to analyze the data will be presented in Chapter 3. The main focus of the theory chapter is on how critical realism can provide a framework to study the world, and especially why this is useful when studying climate change from a social science perspective. The chapter also clarifies concepts that will deepen the understanding of climate change adaptation and factors that affect climate change adaptation. Chapter 4, the methods chapter, describes on what grounds and how the data were collected and the analysis has been conducted. This chapter presents action research as the method of research and explains the implications of this method for both data and analysis. Since action research methods have clear goals of not being neutral in the research process it is extra important to account for how this is affecting the research process. The method of Action research is also seen, in this thesis, as an important part of the data and results.

The analysis of the data will start in Chapter 5, by presenting results of the CBC climate study in El Salvador the spring of 2011. The two local communities Arcatao and Los Pozos that have been studied have a historic context that strongly influences the local community today. It has been important to identify how it is possible to understand and connect with people’s daily challenges and find out how people connect climate change challenges to their everyday life. The stories presented in Chapter 5 will show how connecting with people’s realities can
be realized in practice in an actual adaptation process. Chapter 6 explores what fosters agency and engagement with climate change adaptation in local communities in El Salvador by focusing on those connection points people have between their local reality and the concepts of climate change and adaptation. Exploring what fosters agency it is also important to discuss what creates resistance to a process adapting to climate change. Having looked at how people are capable of dealing with climate change in a specific local context, Chapter 7 will debate how these experiences can be useful also in other contexts. Exploring these research sub-questions through the thesis is important before concluding in Chapter 8. In this last chapter the findings from the study will be summarized, the usefulness and possibilities for using the research, as well as ideas for further research will be suggested.
Chapter 2 Background

El Salvador – a history of conflict

This thesis explores the possibility of connecting better with local realities in a climate change adaptation process with the aim of engaging people as subjects or agents of change. With climate change being a global phenomenon with different consequences in different local contexts, the historic and daily challenges people experience are important when planning adaptation measures. People in the two local communities studied in this thesis, Arcatao and Los Pozos in El Salvador, have a long history of adapting to changes and difficulties. The historic and social context in El Salvador is therefore relevant to understanding how people relate to changes and difficulties caused by environmental changes. The background for understanding these important aspects of people’s everyday life and challenges are presented in this chapter. It is possible to describe El Salvador as a country with high levels of poverty, environmental degradation, social inequality, post-war trauma, crime and violence. It is also possible to describe El Salvador as a country known for alternative models on social development like cooperative organization, popular education, and liberation theology (Hochachka 2005). The study of El Salvador in the context of climate change adaptation, with focus on these aspects of an adaptation process, have great potential to develop a better understanding of how human subjectivity and human agency affect climate change adaptation.

The history of El Salvador is marked by a conflict that is typical for many Latin American countries; the struggle for land. From the 1800s, only 14 big families owned the majority of land in El Salvador, and until after the 1980-1992 civil war the country was run by different military governments. The armed conflict that broke out in the end of the 1970’s was an answer to years of violent and brutal oppression of small farmers and rural land workers (Siverts 2009). An important group with strong influence on the history and society of El Salvador were the priests preaching liberation theology from amongst other the Jesuit church (Nordstokke 2010). Their ideology and actions were important before and during the conflict, and liberation theology priests still stand strong in many Salvadoran churches and communities today. Liberation theology stems from radical Christian priests in Latin America in the 1960’s, who were inspired by critical analysis of society like dependency theory and Marxism. They were critical of how the traditional role of the church legitimized the social injustice in the Latin American society, and wanted the church to take side with the poor and
oppressed (Nordstokke 2010). The social and political conflicts in El Salvador escalated to a full civil war between guerilla groups and the government army after one of the most important symbols of resistance, Archbishop Romero, was killed in a church massacre by an army death squad. The Archbishop had been one of the most important public figures who openly criticized the injustice and the military government, and liberation theology was very important in the resistance movement in the civil war (Blaser 2010).

Economic goals combined with international pressure were the main motives behind the peace negotiations, when the government army failed to defeat the guerilla movements who were joined together under the banner of Frente Farabundo Marti de Liberacion Nacional (FMLN). The peace negotiations were mainly about political structures, and the social and economic problems were neglected. The fact that the roots of the source of conflict never were addressed, and that the problems never really were solved, is something El Salvador still struggle with today (Blaser 2010). After the peace agreements were signed in 1992, FMLN became a political party. The first election after the war was in 1994, where the traditional and historic economic elite won the majority with the political party Alianza Republicana Nacionalista (Arena). As soon as the peace was secured, the Arena government implemented World Bank structural adjustments programs with extensive neo-liberal policies to maintain a good relationship with the United States, who had supported the government army during the conflict (Blaser 2010). Other examples of Arenas strong connection to the US government are how they allowed US military bases in the country for years, and supported the war in Iraq in 2003 as the only Latin American country. In 2001 they replaced the national currency, colon, with US dollars to stabilize the economy (Siverts 2009). The Salvadoran economy struggles with a large trade deficit, which for many years has been compensated by remittances from Salvadorans living abroad. As many as one fourth of all Salvadorans live in the United States, and El Salvador have been hit hard by the 2008 financial crisis, as problems of high unemployment rates in the country was combined with a sharp decline in remittances. This situation creates severe uncertainties in Salvadoran economy (Utenriksdepartementet 2009).

**Vulnerability**

The vulnerability to the consequences of climate change in El Salvador is affected by factors such as poverty and social unrest after the civil war from 1980-1992 (Hochachka 2005). The Salvadoran society is characterized by high crime and murder statistics. According to media and government it is gangs who are behind these violent statistics, and zero tolerance policies
have been implemented several times by both Arena governments and the new FMLN government from 2009. This strategy seems to have led to a stronger polarization between the parts and has made the situation worse (Ranum & Romero 2008). The development in El Salvador has since the war been influenced strongly by neo-liberalism, privatization, and multi-national companies with focus on a large manufacturing and sweat shop industry. The result is a socially and economically divided country with large environmental problems after years of extracting and exploiting natural resources. Many rivers are polluted, deforestation has been enormous, and local air pollution is a main cause of children’s deaths (Hochachka 2005). The last years a reforestation of El Salvador has happened through agriculture and people cultivating the landscape. Even though the result of years of deforestation still is visible when it comes to dangers of floods and landslides during extreme weather incidents; this shows the picture is not completely black and white. On paper El Salvador is still seen as a highly deforested country because the definitions and opinions of what is forest differs (Mertens 2008). This is one example of how human subjectivity affects policies and action in social-ecological interaction. Adaptation policies based on El Salvador as a deforested country will have certain effects; adaptation policies based on the contrary will promote other measures of adaptation. The result for people in a local community dealing with that specific reality will be affected one way or another.

Most environmental battles in El Salvador today are dominated by conflicts between people in local communities and North American companies in partnership with the historic power elite in El Salvador. The local interests in protection of the environment are often linked directly to the survival of individuals and their local communities. There are seemingly endless examples of multinational mining companies who have exploited mineral resources in El Salvador, leaving local communities behind with nothing but polluted and poisonous soil and ground water. In several local conflicts around such resource use, companies have tried to bribe, threaten and even kill local people who organize and rise up against the injustice (Husby 2010). The social differences contributing to vulnerability is also visible in how it is people’s livelihoods in agriculture that is first affected by climate change and extreme weather. A problem with the consequences of climate change is the increasing instability that makes it difficult to act and respond. Unstable weather gives unstable crops and an unstable and insecure everyday life (Berkes 2007). This also affects the ability to plan for the future and will affect the next generations.
Climate and adaptation approaches in El Salvador

El Salvador faces droughts, floods and hurricanes that destroy infrastructure and agricultural production (Hochachka 2005). Such extreme weather patterns have been a constant in the area before, but their frequency and intensity have changed, and climate change may affect these (Hochachka 2005, IPCC 2012). Geographically El Salvador is divided into three distinct regions: the southern coastal belt, the central valley and plateaus, and the northern mountains. The climate in El Salvador has a dry season from October until April, and a rainy season from May to September. Droughts have been studied attentively in El Salvador the last couple of years and it is concluded that drought is an enormous threat to future agricultural production in the country (UNDP 2009). How people in El Salvador struggle with the unstable weather pattern, coping with unexpected drought or massive amounts of water at the wrong time will be presented and explored more closely in chapter 5. Drought is the one extreme to which the weather changes, floods are another. In any case the question of water, whether it is too much of too little of it, is a pressing issue. In October 2011 a ten day heavy rainstorm created a national state of emergency in El Salvador. Extreme rain and floods created landslides and destroyed infrastructure all over the country. Some places 1200 mm rain was measured, three times the average amount for an entire normal month of October. The amount of water coming down in such a short period of time created situations worse than the large hurricanes during the later years like Mitch in 1998, Stan in 2005, and Ida in 2009 did. It was hard to carry out certain necessary preventive measures since it all happened so fast. The rain storm destroyed the country’s crops of corn, beans and rice, the staple foods of people in El Salvador (Husby 2011). In addition to destroyed homes, displaced people and deaths, the agricultural production of El Salvador was heavily affected. According to the agricultural ministry 34% of the total of cultivated corn was ruined, in addition to 50% of the cultivated beans (CentralAmericaData 2011). This situation was serious for people’s food security as prices of basic daily consumer goods increased.

A study by the United Nations committee, Economic Commission for Latin America and the Caribbean (Ordaz et al 2010), about effects of climate change on agriculture in El Salvador showed that climate change already have negative effects on crops like corn, beans and coffee. For these crops a temperature rise has already happened which affects the crops in ways that are difficult, if not impossible, to reverse. It is pointed out that higher levels of precipitation could mitigate the losses. However, it is probable that precipitation levels will decline, in some scenarios between 18% and 40% within 2100 (Ordaz et al 2010). Long term
perspectives on Salvadoran agriculture predict that staple food crops could reach a level of zero productivity in the future without adaptation and mitigation measures, and even with adaptation and mitigation it will cost. These predictions are based on a “business as usual” scenario of economic activity, and the predicted numbers are thus uncertain (Ordaz et al. 2010). Warren (2011) argues that most such assessments of vulnerability, costs and consequences of climate change are mainly single-sector or single region based. Even those who go with wider approaches generally consider impacts in sectors and regions independently, ignoring interactions. Extreme weather and adaptation processes are often poorly represented in such predictions, and losses of ecosystem services induced by climate change or human adaptation are generally omitted.

In El Salvador the Ministry of Environment and Natural Resources is currently working on a National Climate Change Plan that will include a National Action Program on Adaptation; and a National Appropriate Mitigation Actions in the context of the national development priorities (UNDP 2009). These plans focus on science and technology for adaptation and mitigation; national and local capacity building for adaptation and mitigation; and education, public awareness raising and participation of relevant actors and sectors in the design and implementation of the national public policies related to climate change (UNDP 2009).

Agriculture, water, coasts and forests have been identified as priority areas for adaptation in El Salvador. These areas have been identified through a series of key national documents. Guidelines for a national adaptation strategy were developed following the release of the First National Communication, and focused on coasts, agriculture (particularly staple foods and coffee) and forests (UNDP 2009). More recently, El Salvador’s “Five-Year Development Plan” highlighted agriculture, water management and ecosystems in the context of climate change adaptation. The Plan called for the development of a national climate change policy, which is under development (UNDP 2009). No list of prioritized adaptation action exists in El Salvador. Nevertheless, some key actions have been identified, particularly for the agricultural sector, including: the generation and cultivation of new crop varieties; improved water supply and irrigation; soil plant coverage; early warning systems; harvest forecasts; food surveillance systems; farming investment; insurance schemes; research and development; economic policy measures to stimulate grain production; more sustainable agricultural practices; farm zoning programs; and institutions that promote human development and food security (UNDP 2009).
These are good and necessary measures to meet climate change and promote adaptation. This thesis will, however, argue that these approaches are not sufficient for solving neither local nor global environmental problems if they are carried out forgetting the subjective sides of adaptation and change like worldviews, values and potential for human agency. Theories that further explain why these aspects are important will be presented in the next chapter.
Chapter 3 Theory

Critical realism – how to study a phenomenon in open systems?

Understanding how a new approach to climate change adaptation better can connect with local realities and engage people as subjects and agents capable of affecting their own future, it is important to look at how people understand the world, climate change and their own role in affecting the environment. This theory chapter will explore how critical realism can be used to better understand how people relate to climate change, and explain how it is possible to do research on such a complex phenomenon. The concept of adaptation will be presented and discussed to better understand how adaptation plays a part in creating sustainable long-term solutions to climate change problems. Deciding that sustainability is a goal for adaptation has practical implications for what kind of adaptation approach is to be preferred. Arguing that adaptation can be social and political action, the chapter explores how worldviews and awareness can affect an adaptation process. Finally a wider framework of approaching climate change adaptation as an adaptive challenge will enlighten how understanding the complex interactions in a social-ecological system affect all the different interests in such a system. Theory of adaptive leadership will explore how individuals have opportunities to affect a larger system, as well as how a larger system or organization affects individual behavior. These are important questions in regards to engaging people in a local community to consciously adapt to climate change so that the results of adaptation will be sustainable.

Climate change is a complex phenomenon that happens in open systems of interaction between society and ecology. Studying an open system demands considering invisible causal relationships and accepting that there are so many factors affecting this causality, it is not possible to extract elements and study them independently of context (Bhaskar 2010). Climate change demands research with a holistic perspective. Critical realism is an alternative way of seeing research in the scientific debate between empiricism/objectivism and relativism/idealism. In critical realism, reality has an objective existence but our knowledge of it is conceptually mediated: facts are theory-dependent but not theory-determined. Language and conceptualization stands out as one of the most important instruments for scientific research because of the nature of the relationship between practice, meaning, concepts and language (Danermark et al 2002, Sayer 2000). Critical realism indicates that the relation between the real world and the concepts we form of it must be the focus of the research.
process. Even though reality exists independently of our knowledge of it, no one can step out of their conceptual world and check whether reality really exits or what it essentially is (Bhaskar 2010, Danermark et al 2002).

Critical realism sees the world as stratified (Sayer 2000). The three ontological domains used to explain how the world works are the empirical, what we experience directly and indirectly; the actual where events happen regardless of whether we experience them, and the real which is what can produce events in the world, also metaphorically called mechanisms. Scientific work is to investigate and identify relationships and non-relationships between what people experience, what actually happens, and the underlying mechanisms that produce the events in the world (Danermark et al 2002). Critical realism says scientific methods necessarily involve observation of events, but reality is not just a series of events and cannot be reduced to only this. It is also essential to try to find and explore mechanisms that are invisible and unobservable (Danermark et al 2002). Almost all the phenomena in the world happen in open systems, and are generated by a multicity of causal structures, mechanisms and processes (Bhaskar 2010, Sayer 2000). Many such mechanisms are also operating at the same time and affect causal relationships in complex ways, which makes it necessary to look at them as tendencies, not as universal empirical regularities (Danermark et al 2002). Critical realism helps develop and argue that science should have generalizing claims. The explanation of social phenomena by revealing the causal mechanisms that produce them is the fundamental task of research. The nature of society as an open system makes it impossible to make predictions as can be done in natural sciences. It is however, based on an analysis of causal mechanisms, possible to conduct a well-informed discussion about the consequences of mechanisms working in different settings (Danermark et al 2002).

**Academic versus everyday knowledge**

Both scientific and everyday attempts to understand and explain the world starts from our concepts of it. In social science the researched objects are both socially produced and socially defined. Social science is thus carried out on hermeneutic premises (Danermark et al 2002). The objects of social scientists are other people who are interested and active participants, with own definitions and concepts, in the search for knowledge. Often everyday concepts compete with scientific concepts. A possible difference between everyday knowledge and scientific knowledge is that science systematically and consciously reflect upon how to employ different concepts, as opposed to taking them for given (Danermark et al 2002).
relationship between academic and everyday knowledge will be discussed further later in the thesis, as it is a key component of the data material presented in this thesis. How a person understands climate change and how people talk about it, is crucial to understand important but neglected factors in current adaptation strategies. How this can be explored using action research methods will be presented later in the thesis.

Communication and language is a convention in today’s society, and one of its qualities is that it lives independently of people’s intentions here and now. Using the language of our society is to enter an already interpreted world (Sayer 2000). Wanting to express new knowledge we must ask for intersubjective confirmation, other people and other researchers must approve our understanding of the concept we uses. Doing this the validity of our concepts and ideas will always be subject to intersubjective judgment and decision. An eventual agreement will depend on how knowledge has different meaning to different people (Danermark et al 2002). Finding solutions to existing challenges related to climate change demands a certain meeting point between people and their concepts and understandings of the phenomenon. Seeing the world as differentiated, structured and stratified is to acknowledge that existing conflicting practices and interests comes from not only different ways of seeing things, but also from people seeing different things (Danermark et al 2002). Sometimes conceptual changes could even involve change in a person’s entire worldview (Danermark et al 2002), which makes it important to connect with and understand how people see the world.

Environmental issues are good examples of phenomena exposed to interpretations from the social world, and where opinions from different ways of seeing the world affect action in response to challenges. The importance of including everyday knowledge in social science research, even though it is often called false, unreflecting, subjective or unscientific knowledge (Danermark et al 2002), is visible when it is necessary to understand the meanings and mechanisms behind actions and attitudes in a social world interacting with the ecology around it such as in climate change challenges. The aim of this investigation is exploring how people relate to climate change, and how this affects how they adapt to the local consequences of climate change.

Social science and climate change

Jasanoff (2010) argues that climate change and adaptation often have been studied and presented by the more positivist approaches in natural sciences, and that social sciences can contribute to creating a deeper and more relevant knowledge on the subject. An important
point in critical realism is that attained knowledge always is fallible and that its usefulness varies (Danermark et al 2002). Sayer (2000) presents this as an argument of how it is possible to say there is a world independent of what we interpret as human beings and researchers. Scientific activity is a working process. It has the characteristics of production, and does not occur in an intellectual vacuum. The connection between the real world and our knowledge of it could in the end be a question of practical relevance (Danermark et al 2002). The validity of knowledge and concepts depends on how well the knowledge works in practice. This does not mean that practical relevance equals truth in any way. Even though knowledge can be useful to someone, what is true is still dependent on properties, powers and mechanisms in reality, which exist and is what it is, independently of what we think of it for the moment (Danermark et al 2002). The critical realist ontology of a differentiated and dynamically relational world can support holistic thinking in climate research. Reducing the world and knowledge about it to observational events creates a situation where the structures around climate change are seen as less real because of the difficulty of demonstrating them exactly (Cornell & Parker 2010).

Critical realist ontology can combine the objective reality of life processes on the planet with recognition of the necessary complexity and difficulty of prediction of phenomena in open systems (Cornell & Parker 2010). The theoretical foundation that critical realism gives social research is useful in studying how people relate and adapt to climate change. Nature and climate change consists of forces outside human control, as well as forces affected and even tried to be controlled by human’s presence and action. The challenge is to develop an approach to adaptation that considers the difficulty of acknowledging and understanding the complex interaction in social-ecological systems.

**Adaptation to climate change - definitions**

Adaptation emerged as a term used in climate change debates early in the 1990’s when the United Nations Framework Convention on Climate Change (UNFCCC), Earth Summit, in Rio in 1992 suggested two categories of responses to climate change; mitigation and adaptation (Marland et al 2003). Mitigation has been the main focus of international climate change policies, where it continues to be seen as the most important measure to meet climate change (Clarke et al 2009). As climate change impacts started to become more visible, while emissions continued to rise globally, adaptation reemerged as an important term in global policies with the third assessment report by the Intergovernmental Panel on Climate Change (IPCC) in 2001 (Ensor & Berger 2009). The Bali Action Plan from 2008 identified the need for enhanced adaptation action, and the growing focus on adaptation included a special
concern for marginal groups who are dependent on climate sensitive resources and lack the means to adapt. The 17th Conference of the Parties (COP17) in Durban 2011, promoted the concept of adaptation further and an Adaptation Committee was funded. The focus on adaptation measures from Durban were to be defined by 2015, though there were no legal commitments or agreements on what was to be done. One of the main focuses of COP17 was also establishing, developing and getting finances for a Green Fund to channel funds for climate measures in development countries. This negotiation round was otherwise seen to have few other results than agreeing to keep negotiating (Fournier 2011). The international climate negotiations that for years have not managed to create agreement and enthusiasm around common solutions of mitigation or adaptation are one of the signs it is necessary to approach climate change in a new way. The question of how conflicts of resources are the main obstacles in promoting adaptation to climate change is also worth a challenge.

Studying human action in adaptation processes it is useful to look at how concepts around climate change and adaptation are defined. According to the IPPC’s fourth assessment report (Agder 2007), climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the Framework Convention on Climate Change, where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (Agder 2007). Adaptation is defined by IPCC (Agder 2007) as the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, the sensitivity and adaptive capacity of that system (Agder 2007). The definitions of climate change as events happening naturally or with human influence could be decisive of how people see adaptation to climate change and act in an adaptation process. Putting humans outside the equation can make it easier to promote a victim-based response-type adaptation, instead of acknowledging human influence as a power to deal with the source of the problem. This will be further debated with a presentation of Pelling’s (2011) framework to understand adaptation.
Adaptation as social and political action

There are different views on what adaptation is and should be. Pelling (2011) creates a framework to look at adaptation as resilience (stability), transition (incremental social change and exercising of existing rights), or transformation (demanding new rights and social change). He presents resilience as coping with stress and disturbance but staying the same basic structure and keep own ways of functioning, focusing on capacities of self-organization and social learning. He then asks whether imposing resilience in the face of great social inequality is problematic. The extent to which adaptation to climate change can embrace transformation depends on the framing of the climate change problem (Pelling 2011). Adaptation as resilience and transition is more amenable when vulnerability is attributed to local concerns like causes of unsafe buildings or inappropriate land use. If vulnerability is framed as an outcome of a wider social process shaping how people see themselves and others, their relationship with the environment and role in political processes, then the question of adaptation becomes a much broader problem and adaptation as transformation becomes relevant (Pelling 2011). This last definition is most useful in this thesis because the aim of this thesis is to explore how people can be enabled to act as subject with the possibilities of affecting and changing their own future in their own local context. This implies acknowledging that the responsibility for climate change, as well as vulnerability, is affected by social processes.

Pelling (2011) sees adaptation as a potential social and political act, and an opportunity to question dominating forms of development. He argues that what need to be made visible are the human processes driving anthropogenic climate change and the distribution of the impacts of it. Accepting that human action drive climate change makes questions of climate change adaptation a political matter because questions concerning placement of responsibility and payment of costs emerges (Hukkinen 2008). It is important to acknowledge that the climate change debate is about more than scientific facts, and that it is impossible for science to remain objective in a social context. Science often attempts to show causality, and in a social context this is often translated to evidence of liability. When so-called objective scientific proof is turned into a weapon in a social battle of who is to blame for unwanted consequences, there is no escaping science being drawn into politics. For example to accept that oil addiction might drive global warming is also to admit liability. Even though the world suddenly should agree upon human activity as a cause for global climate change, conflicts of what to do about it will then start (Hukkinen 2008. An important point is that adaptation as all other human
activity is political because it affects the world around us, and leads to consequences in a continuing transformation process. Processes of change and adaptation can take different amounts of time (Hukkinen 2008). People today need to acknowledge the problem to start the necessary processes to become able to deal with climate change, and time is not an unlimited resource in this challenge.

Defining adaptation as a political act requires goals for such actions. Even though it can be difficult to operationalize a definition of climate change adaptation, because it is a process that plays out in different ways as responses to different challenges, sustainability often comes up as a goal (Fullan 2004). The discussion of what sustainability is decides whether adaptation measures are evaluated to be appropriate and useful or not. Sustainability should according to Fullan (2004) contain elements like capacity building through networks, leadership, deep learning, and commitment to long term results. Adaptation measures that are implemented without the focus on the balance needed in social-ecological systems can be argued to be less sustainable than adaptation measures that do take different interests and ways of seeing the world into consideration. In academic and policy documents, sustainability is understood as containing ecological, economic and socio-cultural dimensions. A social-ecological system framework strives to look at the interactions between different dimensions of sustainability. In such a system you will have resources, resource-users and both physical and social infrastructure (Hukkinen 2008). The individuals, or resource-users, acting in a social-ecological system will affect the collective with their interests, values and behaviour.

Figueroa (2010) argues that despite the fact that the concept of sustainable development sounds quite innocent; development is part of the logic of modernization and promotes propagation of a capitalist market economy. This concept of sustainable development will not provide a qualitative understanding of growth. A concept of sustainability that insists that scarce resources can be replaced by new, and even not yet known resources, is according to Figueroa (2010) not very useful. Sustainability should instead be about creating a society beyond markets and market relations. Such sustainability would demand big changes in the ruling systems; governmental rules must be changed, priorities of business must be changed, planning systems must be changed, new economic incentives must be developed, and common values and cultures must be changed (Figueroa 2010). Brandt (2010) argues that western society has moved away from the rhythms of nature; people create a separate indoor climate with heat and lights, eat the same food all year round because they can import or grow it, and can shop and work all day and all night long if they wish. The answer, however, is not
to go back to a time without these possibilities of technology. Instead of going back we need to create new sustainable rhythms in daily life (Brandt 2010). Robinson (2004) also questions the eventual dichotomy between sustainable development and sustainability, and answers with promoting the importance of seeing sustainability as a set of concepts used in approaches in community-based thinking instead of one overriding concept.

Holling (2003) argues that sustainable development and management of global and regional resources is not an ecological problem, nor an economic one, nor a social one, but a combination of the three. Sustainable designs driven by conservation interests ignore the needs for an adaptive form of economic development, those driven by industrial interests act as if nature can be replaced with human engineering and management control. As investments fail, the policies of governments, private foundations, international agencies and NGOs flop from emphasizing one kind of partial solution after another (Holling 2003). A missing factor has been the sharing and learning across regions from these experiences. Each spasm of policy change builds on theory. The conservationists depend on theories of ecology and evolution, the developers on variants of free marked models and the community activists on theories of community and social organization. All these theories are partially tested and credible representations of one part of reality, but each misses a critical dimension (Holling 2003). Both natural and social systems can come under pressure because of one-sided exploitation. Even planning and management of adaptation and sustainability quite often creates an unexpected pressure on natural and social systems and can unbalance ecological systems (Hvid 2010).

To help understand the complexity of climate change adaptation it could be useful to think holistically keeping in mind the past, the present and the future of local social-ecological systems who are connected to each other in global networks. In each social-ecological system there are numbers of different stakeholders, including nature itself and other non-human interest. Sustainability in one system does not automatically imply sustainability in all other interconnected systems (Hukkinen 2008). Within a social-ecological system there is potential for action depending on factors like awareness, knowledge, resources, interests and will. There is an emerging consensus regarding the need for broader approaches and solutions to resource and environmental issues, as well as social problems. Many of these challenges need more creative forms of collaboration between scientist and society, and involve a broader range of disciplines and skills (Holling 2003). This is exactly the intention of the climate
change investigation exploring adaptation that will be presented and discussed further from chapter 4 and out.

**Developing adaptive capacity**

A part of promoting sustainability in complex interactions in social-ecological systems is dealing with vulnerability in the system. People most vulnerable to disasters related to climate change are often poor people in rural areas who have little to fall back on after a shock. They are often dependent on natural resources and their livelihoods are threatened when nature is unpredictable and unstable. Extreme weather in the form of wind, heat or rain erodes soils and reduces the productivity of harvests. Their livelihoods are often developed over generations and are based on intimate knowledge of the local environment. At the same time these are the people who find solutions and survive shocks, often because they have to, a strategy sometimes only possible to a certain extent (Ensor & Berger 2009). A definition of vulnerability to climate change is vague without answering; vulnerable to what? There are different categories of consequences of climate change; there are first discrete recurrent hazards like storms, droughts and extreme rainfall events. Another category can be called continuous hazards such as increases in temperature or decreases in mean rainfall over years or decades. A third category is discrete singular hazards, such as shifts in climatic regimes associated with changes in ocean circulation (Ensor & Berger 2009). Lenton (2009) points out how climate change often is presented as a smooth transition, but that small changes with large consequences referred to as “tipping points” can be a more accurate way of describing results of climate change. An adaptation process will look very different for each class of hazards. What are thus the limits for adaptation (Ensor & Berger 2009), and how can people sustain a livelihood if they barely are surviving (Hukkinen 2008)? The fact that vulnerability itself can affect sustainability will be further discussed with examples and results from the climate change investigation in chapter 5.

Seeing that people in poor local communities are those who are most vulnerable to climate change now, and acknowledging power imbalance as part of vulnerability to climate change, is a start to begin with capacity building in adaptation processes. Seeing that local communities often have knowledge and strength to meet these challenges gives an even better starting point. Ensor & Berger (2009) understand adaptive capacity as the ability to change in response to climatic changes, and resilience as the ability to absorb and cope with the unexpected. Adaptive capacity also encompasses the ability to shape and create changes in a
socio-ecological system, and contains both tangible and non-tangible aspects. Diversity supports adaptive capacity by providing communities with options at times of stress and change (Ensor & Berger 2009). Nelson (2009) argues that future research on adaptation will enhance our understanding of social learning, innovation and how transformational change takes place. The role of learning is recognized as a critical part of adaptive capacity. Biological diversity, diverse cultures and values are resources from which we can draw experience and knowledge for adaptation. A critical step in making transformational change a response to climate change is recognizing that we don’t need more adaptation to nature, but acknowledgement of how we “co-create” nature through our actions (Nelson 2009). This is a perspective possibly easier to see in a local context where people perhaps see more easily their own impact on their surroundings. Surprise and uncertainty will not necessary limit our adaptive capacity. Robustness of responses can permit successful adaptation without accurate knowledge of future conditions, but limits do exist and require developing capacity to live within those limits (Nelson 2009). Seeing adaptation as not limited to decisions about technical and economic responses to our climate, could according to Nelson (2009) mean an end of a western worldview placing humans and nature apart with economic growth as an overarching goal.

**Worldviews affecting adaptation**

The reason worldviews are important to discuss is that how people see the world affect how they act and adapt to climate change. Worldview is a concept that is used with different meanings. It can be defined as the overall perspective from which one sees and interprets the world, or as a collection of beliefs about life and the universe held by an individual or a group (TheFreeDictionary 2012). It is possible to talk about a western worldview focusing on technology, efficiency and economic benefits in sustainability. That is a more general and loose description of what a worldview contains. Another way of understanding worldviews is based on research of developmental psychologists who describe worldviews as various orders of consciousness that develop through a human life-span (O’Brien & Hochachka 2010). Each of these worldviews gives rise to different understandings of climate change and affects the adaptive responses. Drawing up some examples of what a worldview can be, it is possible to identify how different sets of values and behaviors respond to climate change issues. O’Brien & Hochachka (2010) construct examples of how to understand worldviews in relation to climate change. First they present a traditional worldview that often is associated with religious or mythic views, and conservatism that presents the “good old days” as a time of
sustainable practices and as a model of desire. A modern/universalistic worldview can focus on science and innovation, emphasizing the study of the scientific aspects of climate change, its links to peak production of fossil resources, and the potential for renewable energy. Responses that promote individualism and corporate freedom are often prioritized, with measures such as carbon trading, corporate wind farms, and support for avoided deforestation projects as a segue toward, and sometimes instead of, reduced industrial emissions (O’Brien & Hochacka 2010). In many ways this is a worldview that to a certain extent represents what has been defined as current approaches to climate change and a western worldview in this thesis.

O’Brien & Hochacka (2010) also construct a postmodern/pluralistic worldview which is characterized by the complexity of the issue. People with this worldview see the social justice dimensions and an ethical need for “thinking globally, acting locally”. Postmodernists will be the first to criticize carbon trading mechanisms, ecological modernization, and corporate models for responding to climate change. They understand the complexity of the situation that has caused climate change through overconsumption, overreliance on fossil fuels, and linear extraction of resources from the hinterlands to centralized locales. Yet the proposals for moving forward are not always realistic. People within this worldview would promote organic gardens in every household, biking instead of driving, and local recycling and resource use with the assumption that everyone will soon have green values and a world centric awareness (O’Brien & Hochacka 2010). This is a worldview also present in the western worldview, perhaps especially in the western environmental organizations battling political initiatives with the modern/universalistic worldview. This division and classification of worldviews is a picture of how it is possible to present how worldviews can relate to climate change and adaptation. In the local communities Arcatao and Los Pozos it is possible to see a mix of these worldviews depending on who you talk to. Elements from the different worldviews can be present in individuals and local communities. Worldviews are one of several factors affecting how people behave and act when dealing with and adapting to effects of climate change. Since worldviews are not easily changed, it is valuable to explore what people value and are able to relate to within their existing worldviews.

The idea that humans are changing the climatic system can be considered a radical belief that challenges many existing worldviews (O’Brien & Hochachka). Adaptation is thus also about the wider capacity of individuals and societies who have to respond to challenges to existing
beliefs, values and worldviews. No matter how excellent technology and systemic changes are, they will be of no use if people do not understand how to use them or have the motivation to do so (O’Brien & Hochachka). There is a need to consider how people and communities perceive the challenges of climate change, and to be aware of how the very idea of climate change affects and is affected by worldviews and beliefs (O’Brien & Hochachka). Climate change is affecting social-ecological systems in many ways, and can be seen both as a product of and a driver of change (Hukkinen 2008). For now climate change affect poor people living rurally more severely because they are in danger of losing their immediate livelihoods due to extreme weather and uncertainties (Huq et al 2005). In such scenarios adaptation as response to climatic events happens. Climate change will, however, affect larger areas and more people on a long-term basis (Ensor & Berger 2009).

The focus of the environmental movement in countries that not yet is perceived as strongly affected by climate change, is engaging in changing organizations and individual’s behaviors as solutions to the climate change issue (Crompton & Kasser 2009). This focus could lose the systemic dimension of whom and what are responsible for climate change and who needs to change behavior and ways of working. Human actions and behavior, whether in an adaptation as response scenario, or in dealing with consumption patterns and mitigation policies in the western world, meet perhaps some of the same challenges because one on all levels neglect the subjective sides of meeting climate change. Climate change is difficult to understand because of the complex and invisible causal relationships causing it, and because of the different views on what is actually happening or what needs to be done about it (Constanza 2010). Both the cognitive individual and the structural systemic challenges around why and whether people are able to deal with climate change have parallels crossing different local contexts and levels of organization. Studying how to connect with peoples realities in one local context can perhaps also enlighten aspects of difficulties in adaptation processes and actions around climate change in other local contexts, even though the concrete challenges differs. Antal & Hukkinen (2010) claim major behavioral change is urgently required to address the environmental challenges facing humanity. Belief systems describe how individuals make sense of their interactions with their social and biophysical environment, and are important drivers of behavior. Behavioral change has been identified as a key factor in both top–down and bottom–up approaches to climate mitigation and adaptation (Antal & Hukkinen 2010). An important factor that affects how people are able to deal with climate
change is the cognitive resistance to change that is visible in different ways in different worldviews.

**Resistance to change**

Antal & Hukkinen (2010) presents the history of human-environmental relationship as humans transforming the world around them to economic resources through focusing solely on the economic value of natural resources. They see this separation between humans and nature as an attempt of humans to break free from nature, but instead people are become more dependent on it. When people separate themselves from nature through for example using technology to transform and control nature, vulnerability can increase. In the case of human-environment interaction, an individual's belief that independence increases with expanding use of natural resources is contradicted by feedback from the broader social-ecological system indicating diminished options and increased systemic dependence for the individual (Antal & Hukkinen 2010). Antal & Hukkinen (2010) claim people will accept the lie that they are freeing themselves from nature by expanding their use of it and controlling it, rather than lose the false feeling of security by acknowledging that humans are ruining nature on a long-term basis. It becomes psychologically risky to identify the problem, because the truth interferes with amongst other things the different opinions and practices relating to short-term wellbeing. Antal & Hukkinen (2010) describes this conflict as a double bind, which is a cognitive conceptualization of human beliefs and behavior with respect to ecosystems. From the cognitive point of view, the existing science-focused way of communicating the climate change message only fuels the distancing in an individual's mind between beliefs concerning safety and social-ecological survival (Antal & Hukkinen 2010). This conflict of not wishing to acknowledge the problem is central in why people are resistant to dealing with climate change.

This cognitive challenge is related to people's worldviews and affects how people interact within the social-ecological system. It has earlier in this thesis been pointed out how fear stemming from the apocalyptic presentation of climate change can hinder constructive action in adaptation processes. Crompton & Kasser (2009) describe how strategies to cope with these fears can be defense mechanisms to get rid of feelings of anxiety and guilt that threaten own self-esteem and identity. One strategy is selective attention, replacing anxiety-arousing material about climate change with distracting material or limiting their exposure to that kind of information. Other behaviors included in the selective attention strategy is doing something
small, avoid thinking that far ahead, or even seeking pleasure and over consuming despite of environmental problems. Denial of guilt often combined with projecting guilt on someone else, or relativization of one’s own part in the problem are other defense mechanisms. The modern environmental movement is dominated by concepts that serve to reinforce the perception that non-human nature is an economic resource to be exploited. The business case for sustainable development, payment for environmental services, and green consumption are all examples of that (Crompton & Kasser 2009). Studies of almost one thousand university students from six nations also found that values for power and achievement were associated with viewing humans as consumers of, rather than part of, nature (Crompton & Kasser 2009).

Crompton & Kasser (2009) propose a strategy of encouraging values that are psychologically opposed to self-enhancing, materialistic values. This strategy suggests that environmental organizations can work to decrease the extent to which such values are modeled socially. This can help people cope with feelings of insecurity in more adaptive ways, and develop programs and policies that promote intrinsic, self-transcendent values for personal growth, close relationships and helping the broader world. In considering approaches to promoting intrinsic and self-transcendent values, it is important to recognize that the relationship between the values individuals hold, and the behavior they exhibit is a complex one (Crompton & Kasser 2009). From the cognitive point of view, a constructive approach is to begin imagining long term sustainability. A mental change in how to see civilization can be important. Believing people have to transform or save our civilization from natural destruction due to climate change, could create more resistance than focusing on how to maintain a civilization where the relationship between humans and nature is characterized by co-operation instead of conflicts of interests (Antal & Hukkinen 2010). Individual cognition, worldviews, beliefs and behaviors work together in complex relationships. This attempt to bring out a small incomplete selection of possible factors that affect human agency in climate change adaptation, is here used to show the complexity and richness of focuses needed to be studied related to adaptation to climate change. A challenge in climate change adaptation work seems to be taking into account these subjective aspects like values and worldviews (O’Brien 2009), that affect the process of adaptation. This thesis is investigating the hypothesis that exploring the way people think about climate change and adaptation is an important part of a new approach that can connect better with people’s local realities and everyday lives. The next section will argue that this requires dealing with climate change and adaptation as an adaptive challenge.
Adaptive challenges

Presenting and discussing adaptive challenges in an adaptation process, it could be important to note that the adaptive challenge concept is not directly connected to adaptation to climate change, but an approach to meet and analyze many different challenges. This thesis uses the concept of adaptive challenges to explore what focuses are needed in addition to existing approaches to climate change adaptation. Theory of adaptive challenges tries to understand the relationship among leadership, adaptation, systems and change in practical ways. Heifetz (2010) explains that actions of change that also require changes in people’s priorities, beliefs and habits can be called adaptive challenges. Adaptive challenges are different from technical challenges with technical solutions; known solutions that can be implemented with current knowhow. A sign of whether a challenge is technical or adaptive is if technical solutions have been tried, and tried again without results (Heifetz 2010). Recognizing climate change adaptation as an adaptive challenge might make researchers and policy makers look for new solutions to these challenges. An important point is that most challenges will contain both technical and adaptive elements, even technical solutions that we know how to execute might need a change in mentality to be made a common and useful practice. A big problem, however, is when adaptive problems are solved with technical responses; this only creates short term solutions. This thesis will show in chapter 5 how the main focus in current adaptation approaches focus on technical solutions and often forget or neglect the adaptive elements.

According to theory on adaptive challenges successful adaptation enables a living system to take the best from its history into the future. Since adaptive challenges are often treated as if they were technical problems, focusing on seeing the difference and acting accordingly promotes a type of leadership called adaptive leadership (Heifetz 2010). A leaders challenge lies in helping people decide what is essential to preserve and what needs to go in a process of change. Human beings have through history formed cultures through each generation learning from its elders, and cultural norms have helped people when changing livelihoods from one type of society to another. New environments and new ways of living require new strategies and abilities. Change and learning can be painful, and not many people wish to change or be changed (Heifetz 2010). The concept of adaptive leadership starts with separating the technical and adaptive elements of a problem. This way it is possible to identify where the problems really lies, and when it is a problem that lies in people, the solution also lies in people (Heifetz 2010). In a local community adaptation process there is a number of both
technical and adaptive challenges that must be taken into consideration as we will explore further through the thesis.

Adaptive challenges are difficult because their solutions demand a change in people’s mindsets. Many people apply solutions from earlier experienced problems to a problem of a different kind, without considering eventual new value-laden complexity (Heifetz 2010). Changing mindsets; priorities, beliefs, habits and loyalties involves trying new ways; tolerate losses, and gaining new capacities (Heifetz 2010). Such practical problem solving in a complex human dominated system requires integration of several elements. It requires active and ongoing envisioning of both how the world works and how people want the world to be. Second it is necessary with systematic analyses appropriate and consistent with that vision, and at last implementation of actions appropriate to the vision is in order (Constanza 2010). One could argue that to be able to start such a complex process, awareness of what is happening in the world and of what kind of a world people want for themselves is a key starting point. Adaptive challenges are hard to define and require people to reinterpret and question their own priorities, habits of thinking and behaviors. Promoting adaptive change often upsets the status quo and creates disequilibrium (Heifetz 2010). Adaptive leadership also challenges ideas about own values when it is necessary to make choices. One way of really knowing what you hold true or value, appears when one belief comes into conflict with something else you believe in (Heifetz 2010). Many people have ideas of what they believe in but do not consistently behave in ways conform to it (Festinger 1957). Larger social structures can also be a part of forming values and behavior that does not necessarily correspond (Bhaskar 2010).

It is necessary to recognize people’s losses in a changing situation, and help them deal with it and counteract destructive defensive patterns that can arise (Heifetz 2010). There is a myth that drives many change initiatives; that an organization or a system needs to change because it is broken (Heifetz 2010). What is often forgotten is that in any social system there are people who benefit from the current situation and have an interest of keeping it the way it is. They are often important people in the organization, and a person trying to name or address a dysfunction in such an organization will not be popular (Heifetz 2010). Many organizations get trapped in their current way of doing things, because this is how things have worked for a long time and it is how people who work in the specific organization have succeeded (Heifetz 2010). Asking questions about the methods and changing an organization can also be
challenging to a leader’s own ideas, values and beliefs. Heifetz (2010) points out that young leaders in organizations often become servants of what is, instead of shapers of what could be. Every organization defines success as different desired outcomes, and the behaviors that help generate those outcomes get rewarded, while those who do not get devaluated. Over time, the structures, culture and defaults that make up an organizational system, a local community or even an international society can become deeply ingrained, self-reinforcing, and very difficult to reshape. That makes sense when things are going well, but can prevent adaptation to a new context in a situation of change (Heifetz 2010). The results of analyzing what are adaptive elements and what are technical elements in adaptation processes in local communities in El Salvador, and how this can help in connecting with peoples local realities, will be presented in chapter 5.

**Awareness and action**

Since adaptive challenges is about dealing with change in values, attitudes, worldviews and behaviour to create action in a difficult situation, theory on how to create awareness and feelings of responsibility is suitable to discuss next. Paulo Freire’s “pedagogy of the oppressed” is a theory of liberation through a learning situation derived from an analysis of power relations. Freire recognizes that education is ideological and concentrates on the creative capacity of humans and their ability to resist in a power relation (Berglund & Johansson 2007). A dominance relationship is often built on a violent act of the party in power. Violence can be defined as power used to make people act against their will, actively or passively. Violence can be seen as a process that continues over generations in unjust power relations, creating livelihoods and worldviews for both parts of a power relationship (Freire 1999). An oppressed part in a power relation will often have a complex perception of the dominant part, which is subject to envy and hate. At the same time the oppressed part will often live with dreams and desires of taking part in the dominant parts side, where the dominant part is a picture of dignity. Conscientization is what is necessary for a person to become subject both in his own life and in historical processes (Freire 1999). The basis for the idea is that the oppressed must liberate not only themselves, but also their oppressors because both parts in a dominance relationship will have lost their dignity. There is often a danger in liberation processes that the oppressed part only will become the oppressing part if the current oppressors are overthrown, and no liberation will come from power exchanging hands (Freire 1999). In the conscientization process the oppressed part must reveal the context of oppression; through practice they must engage in reshaping the context and create a liberation
process. There is always the risk in such a liberation process that the people currently in power will feel oppressed because their opportunities and benefits associated with their existing power may disappear (Freire 1999).

Teaching and learning is to critically get to know the world, and it is a political act as the teacher defines the material (Freire 1999). In an actual conscientization process where people shall be made aware, one must move away from the traditional structure in which the teacher is the active subject and the student the receiving object. The student must participate, ask questions, and learning must be a dialogue, instead of reducing it to an action of one person transmitting own ideas to another (Freire 1999). In regards to climate change adaptation it is possible to make use of Freire`s pedagogy of the oppressed. Resistance to change often comes from fear of losing current benefits in an existing system (Heifetz 2010). Both on an individual level as well as on a structural level some people benefit from keeping status quo, whether it is from economic incentives or from keeping peace of mind with not thinking far enough ahead (Crompton & Kasser 2009). Bringing about conscientization is part of the way Centro Bartolome de las Casas (CBC) work, and methods that can lead to conscientization will be presented in chapter 4. To make the pedagogy of the oppressed useful in relation to climate change adaptation, Nurenberg (2011) argues it must also be matched by pedagogy of the privileged. Both pedagogy of the oppressed and the privileged is described as an inquiry process where people become engaged. The importance with pointing out the need for pedagogy for the privileged is that those in power and those in privileged groups play an important role in climate change policies. The point of a conscientization process is that knowing about a problem is not enough, feelings of responsibility and confidence in possibilities to act and change is necessary. A conscientization process deemed necessary for being able to deal with climate change adaptation locally, can be equally important, and perhaps even more so, within elites and decision makers nationally and internationally (Nurenberg 2011). Participation could then becomes an ecological imperative, and the failure to understand human participation in natural processes, and the connection between this and the damaging of the worlds ecosystems could become visible (Reason & Bradbury 2006). Exploring an approach to climate change adaptation that promotes conscientization in a local adaptation process could bring lessons to other contexts and processes where people have to deal with climate change issues.
A process promoting active participation could also be a means of reducing resistance to change. Pasmore (2006) demonstrate that participative management methods in a work situation, with discussions about changes between different stakeholders in an organization, are more effective than work situations where changes are forced upon people who don’t have a say. Studies have shown that behaviour of an individual depends on a combination of both personality and environment, and that leadership style is crucial to how a group of people function (Pasmore 2006). In a certain study only groups with democratic leadership styles as opposed to groups of autocratic or laissez-fair types of leadership managed high productivity combined with a low conflict level (Pasmore 2006). The ideas of pedagogy of the privileged, as well as the oppressed, can be seen in connection to the necessity of acting on several levels to create appropriate local responses to the local outcomes of the global phenomenon climate change.

A community, like an organization is never one overall system but a set of subsystems. Three important components that shape the way people deal with adaptive pressure are structures, culture, and defaults (Heifetz 2010). Structures create the playing field and rules for activities, each structure can enhance or constrain an organizations ability to adapt to changes. An organizations culture is made up of its stories, rituals, group norms and meeting protocols. These might not be written down and formally documented but powerfully determines what is considered acceptable behavior (Heifetz 2010). Adaptive leadership requires understanding a group’s culture and figuring out which aspects of it facilitate or stand in the way of change. Defaults are the ways of looking at situations that lead people to behave in comfortable ways that have generated desirable results in the past. This kind of response can contribute significantly to solving a short-term problem but might hinder a solution on a longer term basis (Heifetz 2010). Defaults can especially constrain adaptability in a changing situation in need of new ideas and action. Facing new realities requires taking on behaviors that feel risky and uncomfortable (Heifetz 2010), a necessary strategy when trying to find solutions to the complex challenges of adaptation to climate change. This is possibly one of the greatest challenges human beings have in dealing with climate change and adaptation, together with lack of connecting with peoples worldviews which can prevent or promote action to solve current as well as future problems. Critical realism’s point that people see different things because they experience the world subjectively combined with theory on adaptive challenges show the importance of dealing with all levels from the individual to the overlying systems.
An important element that often disappears is the invisible connections between the levels. Adaptive leadership could possibly be a part of becoming aware and acknowledging the complex and often unrecognized connections between human action and climate change, as leadership can be an opportunity for an individual to affect a larger organization, a community, or a system. Awareness and recognition of the dimensions of the problem is one of the first steps to create solutions. Solutions to problems in climate change adaptation processes are in need of an act of demand from people on different levels, from individuals and local communities. Adaptive leadership as leadership in contrast to authority and conventional power might be a way of bringing about such needed participatory conscientization processes. A research method promoting participation aiming to raise awareness about a field of study is action research (Reason & Bradbury 2006). Using action research investigating an adaptation process can contribute to develop understanding of the role of human agency in climate change adaptation processes. How this is done will be discussed further in the next chapter.
Chapter 4 Methods

**Investigating climate change**

A motivation for exploring new approaches to climate change adaptation is the desire to create knowledge and find solutions to climate change challenges that can create long term sustainability. As stated in the previous chapter many of today’s solutions are based on seeing climate change adaptation as a technical problem needing technical solutions. Politicians talk about technology, sustainable development and green economy in a framework of existing systems and existing ideas of how the world works and should work; without ambitions or even wishes to see the potential for change in today’s systems. Claiming that climate change adaptation should be approached as an adaptive challenge, where people’s worldviews and values also should be considered, need reflection on and a deep understanding of how people relate to climate change. This requires use of qualitative methods, which have traditionally been used in studies associated with deep understanding of a phenomenon. The method involves close contact between the researcher and those studied and raises practical, methodological and ethical challenges in the research project (Thagaard 2009). This chapter will present the theoretical scientific foundation of action research and the methodological choices made from this philosophic foundation. Explaining how the dynamics of action research work; and how it contributes to better understanding, knowledge and action in climate change adaptation processes, could contribute to deepening the understanding of the importance of such methods in climate adaptation work. A presentation of the methodological choices before, in and after the field work will follow, and a discussion of interpretation and analysis of the data will round up the chapter.

The thesis has been written in collaboration with the project Sustainable Adaptation in El Salvador: An Integral Approach (Salsita) led by Gail Hochachka from the Canadian NGO Drishti - Centre for Integral Action in collaboration with professor Karen O’Brien from the University of Oslo. The Salvadoran NGO Centro Bartholome de las Casas (CBC) has been the NGO executing the Salsita-project in El Salvador. Through action research and action dialogue in El Salvador and Canada, the Salsita-project seeks to contribute to the understanding of community resilience and human development in the context of climate change adaptation, and to share results with community organizations and communities in both countries. The ideas of the Salsita-project is founded on the idea that people’s capacity to act in an insecure and changing situation is what it takes to create constructive policies and
creative local action in climate change adaptation work. With the Salsita-project being a larger project with its own goals, methods and strategies, the focus in this thesis is based on a specific part of the research process. The thesis is depended on and grateful to the larger Salsita-project but is based on an own selection of the specific data worked out in collaboration with the other researchers. Since qualitative methods always depends much on the interpretation of the researcher, the thesis also stands on its own. This thesis has a specific focus on the selected material from a certain time in the project and hopes to contribute to the understanding of the phenomenon the larger project is exploring. The next chapter will answer more clearly the first research sub-question: “How can connecting with local realities in an adaptation process be realized in practice?” Keeping this question in mind also when reading this methods chapter is useful because the research methods used in the Salsita-project, and in this thesis, have been important parts of both bringing about the data and for the process of connecting with people’s local realities in practice.

**Action research**

As the changes and development in a society are affected by values and beliefs, so is also the knowledge about how society changes (Fals Borda 2006). Climate change adaptation processes deal with complex situations with many stakeholders who have different interests, and where social and ecological interests must find a sustainable balance to be successful (Hukkinen 2008). An important method in studying subjective aspects of adaptation and creating useful knowledge about this is action research. The foundation of action research is doing experiments in the field rather than in a laboratory (Gustavsen 2006). According to Gustavsen (2006) basic concerns for action research are how to connect theory and practice, and to recognize that unless people can relate to each other in a democratic way, no new ideas, just causes, or indeed any science, be it social or other, are possible Action research might not be as much of a methodology as an orientation toward inquiry. Action research desires to create a quality of engagement, curiosity, and question-posing through gathering evidence and testing practices. There can therefore never be one right way of doing action research (Reason & Bradbury 2006). In doing research on and creating knowledge about climate change adaptation processes; this is a crucial aspect of bringing about understanding of the complexity of knowledge needed to help people adapt to climate change. Action research is a participatory, democratic process with the aim of developing practical knowledge and useful solutions to existing challenges in people’s everyday lives. It is grounded in a participatory worldview that Reason & Bradbury (2006) see emerging at this
historical moment. It is also focused on increasing economic, political, psychological and spiritual well-being for people and communities, as well as on creating a more equitable and sustainable relationship between humans and the wider ecology. Action research is about working towards practical solutions and creating new forms of understanding (Reason & Bradbury 2006).

Reason & Bradbury (2006) argue that action research stands out from other forms of research by discussing the purpose of knowledge. As opposed to having as a primary goal producing academic theories based on action, it also seeks to liberate the human body, mind and spirit in search of a better and freer world. Another goal for action research is creating shifts in the power balance in favor of poor and marginalized groups in society. In addition to being concerned with producing knowledge and action useful to a certain group, there is also an idea that participation can empower people at a deeper level and make them capable of constructing and using their own knowledge (Reason & Bradbury 2006). An important point in action research is including everyday knowledge in the research process. By having such goals for the research, action research contrasts institutions of other views on science and academia where a monopoly of knowledge-making process often is created (Reason & Bradbury 2006). In regards to climate change Reason & Bradbury (2006) argue that changing people’s worldview is central in our time because there are epistemological errors built into people’s way of thinking that has led to material welfare at the expense of ecological devastation, human and social fragmentation and spiritual impoverishment. The participatory worldview is a political statement as well as a ground for theory of knowledge (Reason & Bradbury 2006), and can perhaps contribute to the idea of what kind of worldview is required for achieving success in present and future adaptation processes. However, changing people’s worldviews is not easy, and perhaps not even possible or ethically right. Connecting with people’s worldviews, however, could be helpful in an adaptation process as changes in behaviors and mindsets are required for adaptation to become sustainable. Freire’s (1999) concept of conscientization is perhaps helpful if arguing that worldviews must change to deal with climate change, with the focus that individuals must start the change from within. The political dimension of participation affirms people’s right and ability to influence decisions that affect them and claim to generate knowledge about them. The connection between knowledge and power might become more visible when focusing on showing hidden and muted voices from class structures, racism, sexism or homophobia, as well as in climate change adaptation processes (Reason & Bradbury 2006).
Participatory forms of inquiry aimed at solving practical problems have always existed in human cultures, and have contributed to all life-supporting human activities. Since action research move away from the empirical-positivist worldview that has been the foundation for western inquiry since the enlightenment, it is a part of a shift from a modern to a post-modern world (Reason & Bradbury 2006). Reason & Bradbury (2006) argue it is necessary to look at the practical consequences of modernism, and point out the importance of language in creating our world. Critical realism also argues that language, concepts and personal understanding of how the world work affects people’s actions in the world (Danermark 2002, Sayer 2000). Reason & Bradbury (2006) point to the participatory worldview as a new possibility of comprehending and acting in the world. In the last chapter people with post-modern worldviews were criticized for not being realistic in their belief that their worldviews of good intentions would spread throughout the world (Obrien & Hochachka 2010). This thesis argues that connecting with whatever worldviews people have are important to understand the relationship between human action and climate change and that an eventual change must come from within. Starting to connect with people’s worldviews acknowledging people’s local knowledge is then crucial.

**Acknowledging local knowhow**

Although action research exist and is widely used it is still an alternative paradigm competing for legitimacy, and the majority of important organizational decisions continue to be made by “experts” both in science, working life, as well as in politics (Friedman 2006). Human needs continue to be viewed as secondary to technical and economic advancement as measures of progress in society. Action research attempts to address the widening gap between social science theory/research and social science based on professional practice. Although technical rationality might work well in engineering and medicine, it won’t necessarily do so in social work, education, policy planning or management (Friedman 2006). Effective practice in these fields is often attributed to intuition and personal skills. According to action research there need not be any division between those who produce knowledge and those who use and implement it. The rules that produce valid positivist explanations of social problems can seldom produce the knowledge on how to do something about it, because they produce theories that are too complex to be used by practitioners who must function in a situation where all variables are constantly changing (Friedman 2006). The process of action research is cyclical in the way that diagnosing, planning, implementing, collecting and analyzing data, discussing outcomes with members and reaching conclusions of how to move on, all affect
each other (Flood 2006). Developing a cyclical system of how to continuously learn from experience, increases capacity to deal with greater complexity and change. Doing research on the premises of those who are being researched open up for new ways to create knowledge. It is also necessary to open up to untraditional forms of communicating to really emphasize the value of local knowledge (Berkes 2007).

Drawing, dramatization, storytelling and photography are forms of communication and presentation that could be more appropriate for doing research on communities where people are not used to, or comfortable with, question forms and interview techniques based on a western positivistic worldview (Lykes 2006). An example is the technique PhotoVoice, where participants take pictures to explain events, feelings and motivations. This technique offers important information both on the level of photography as documentation of reality, and from the subjective stories behind a photo. Creating collective stories by taking pictures in a certain situation can become an opportunity to develop both individually and together in the local community (Lykes 2006). Validating subjective ways of knowing is an incredible tool for empowerment, particularly for people who come from oral cultures or those who are illiterate. By using these tools of subjectivity and embodied practice, “valid knowledge” is not only contained in the written word, but is available to anyone (Lykes 2006). Making subjective knowledge accessible through this method can serve to empower people, and influence political or social behaviors in a society (Hochachka 2006). PhotoVoice was used as a main working method in the interview process in the Salsita-project in El Salvador.

**Case study**

After an action research field work, it can be useful to present the data and analysis as a case study, based on case study as a strategy for presenting a complex data material. The data is non-survey-based, qualitative, and the evidence is gathered in a real life context where case and context are difficult to separate. Yin (2009) presents case studies as investigating a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident. The product of a good case study is insight, and it connotes a spatially delimited phenomenon observed at a single point in time or in a period of time (Gerring 2007). These are some traditional criteria that recognize the case according to Gerring (2007), even though case studies can be presented with any form of methods used like survey-based, quantitative and large number studies as well as a presentation of a more complex single phenomenon. Whatever the chosen unit is, some
temporal and spatial boundaries must be assumed, and the methodological issues attached to a case starts with whether a single case can be representative of a larger population of cases (Gerring 2007). This particular case is limited to the research process of Centro Bartolome de las Casas in Arcatao and Los Pozos that took place during a two month long field stay there the spring of 2011. An advantage of case study methods is that it has high conceptual validity, and allows a researcher to identify and measure the indicators that best represent the theoretical concepts she wants to measure. By this it is possible to take context into consideration. The case selection should be based upon a well developed research strategy. Case studies have strong procedures for fostering new hypothesis, and develop theory (George & Bennett 2005). Based on the research question the most apparent goal of this thesis is to develop existing theory by widening the understanding of people’s relationship to climate change by bringing a range of perspectives into the debate. As mentioned earlier, the philosophical foundation of action research also promotes contributing to developing the studied local communities as an outspoken goal for research.

Field work with Centro Bartolome de las Casas

I went to El Salvador on April 25th 2011, and stayed with the NGO Centro Bartolome de las Casas (CBC) for two months before returning to Norway on June 20th 2011. The experience gave me the opportunity to work with a climate change investigation in a research team consisting of people from different disciplines like biology, anthropology, agronomy, theology and philosophy. During my first week in the office of CBC in San Salvador, I was introduced to CBC, and learned about what they do, and how they work. I also participated in meetings at the University of San Salvador, and in workshops in the office where they presented their way of thinking and working, also with other themes than climate change. CBC was founded to become a gathering place for people, ideas, values, and backgrounds, with the aim of not only to naming differences, but to also to find places of unity (Hochachka 2006). Some of the several subjects CBC works with are solidarity economy, theology and the bible, mental health, memory and trauma-work from the war, and gender and masculinity. They look at the individual in the collective and focus on how worldviews and emotions must be part of the whole picture. In their work CBC has embraced the way of active participatory work and research. The specific themes they focus on like masculinity in gender and equality work is a way of touching upon what would otherwise be left alone.
The climate change investigation named Salsita is a project where CBC brings new aspects into climate change research. CBC contributes to research on climate change with focusing on the whole picture using experiences and perspectives they have from working with themes like war-trauma and gender. The Salsita-project was carried out in several phases. In phase one the project researched local communities’ resilience to change with a literature review focusing on culture and human well-being in the planning of adaptation to climate change. The object was to examine how community resilience and human development could be better integrated into adaptation efforts in the context of climate vulnerability and to identify research themes through dialogue. Phase two of the project consisted of gathering community perspectives. This was the part I participated in when staying with the CBC. With the use of PhotoVoice local families were interviewed about what they face, where and how they feel most resilient, and what adaptation looks like to them. This was meant to increase awareness and deepen understanding of what works in regards to supporting sustainable adaptation to climate change in vulnerable communities. The PhotoVoice-interviews have later been followed by focus groups in which individuals shared their insights and information they generated through the exercise, which was then brought into discussions on community strategies and plans of adaptation. In phase three the object was North-South learning exchanges, with workshops in Canada and in El Salvador. The workshop dialogues involved sharing of knowhow and tech-transfer as well as sharing photos and narratives from vulnerable communities in El Salvador to contribute to understanding and innovations in climate change adaptation in other vulnerable regions. I have not participated in these later phases of the project.

The climate change investigation was executed in the two local communities of Arcatao and Los Pozos north in the department of Chalatenango on the border of Honduras. Each of the local communities has its own special micro climate. There are weather stations located in two different areas at a distance from Arcatao, and the official data about the local climate in the area is calculated and presented as a median of the measurements of these two closest weather stations. This is an example of the difference between scientific presentation and reality, as well as a reason why it is important to work in just this region. When the median between two other places are presented as the true representation of the weather in Arcatao, the scientific models of climate and weather are without real life connection with the local communities. This will present a wrong picture of the climate and changes in Arcatao and Los Pozos. This could create severe consequences for when the local communities plan for
adaptation. The real local weather, climate and changes must be studied and presented when the local community is to plan for adaptation, or else adaptation measures will not correspond with what is really needed.

The investigation of adaptation to climate change worked with seven families each in the local communities of Arcatao and Los Pozos. The families were found through other projects of the CBC in the region, like through a local economy project and a mental health project focusing on trauma from the war. I was introduced to the families as part of the research team, and met them several times for interviews during my stay. Through the time I was there my role as an outsider developed relatively smoothly from being the tall, weird “chele” (a pale person) who followed the research team around, to connecting with the participants of the project. I noticed that at first people just acknowledged my existence as a strange element that probably soon would leave without returning. When people understood I wasn’t just there to have a quick look and disappear, confidence rose little by little. In the research team we were aware that moving around like the locals did, and participating in local events created confidence. Walking for hours to get to the local communities when the car wasn’t working, sleeping in the communities and participating in events like memorial services and the weekly Sunday mass were important in understanding daily life and experience solidarity and connection with people.

Selection of methods

The methods used during the field work were direct observation, participatory observation and qualitative interviews in an action research context. Hesselberg (2011) points out the differences of opinions of what really is participatory observation, arguing that simply staying in the field is not enough. The action research philosophy encourages participation in all parts of a research process. Because I participated actively in meetings and workshops the data is based on, I would argue that this is participatory observation. Doing good research means to be able to recognize why the accounts generated by particular methods can be very different, and further to be able to use these differences. Different techniques put in use should each contribute something to the project, rather than being repetitive of each other (Valentine 2002). In the presentation of the data as an explorative single case, both interviews and observation contribute to a deep understanding of a complex context and process (George & Bennett 2005). Kvale & Brinkmann (2009) describes the qualitative interview as a situation where researcher and informant create knowledge together. An interview provides
information about informant's experiences, opinions and self-understanding. Observation gives basis for information about people's actions and relationships without having an outspoken statement about it (Thagaard 2009). Interview and observation can therefore often be smart to combine. Elin Sæther pointed out in a lecture on field work in the class SGO4010 at University of Oslo 10.02.11 that many students forget the importance of observation and the information you can get without asking direct questions about everything during the field work. This thesis sees the knowledge and data analyzed here as created and constructed in a process of communication between several co-researchers and participants.

The interviews executed in the project came about by the technique described as PhotoVoice. The process of PhotoVoice was; each family got two weeks with a camera to portray the answers to a question, the process was repeated until they had answered three different questions about climate change and adaptation. One person in each family was the responsible main contact person but all members in the family could take photos, and there were no limits to how many photos that could be taken. The conversations and interviews when we met were based on the specific questions and the photos that had been taken. When people were without the cameras we met up every week/two weeks to talk about personal stories, and the history of the war in the region and how people experienced it. This was a process that started before I came to El Salvador and that continued after I had left. The data I use in this thesis is based on the written field diary I wrote during my stay with transcriptions of all interviews and observations I participated in. Other than interviews, the data come from workshops and meetings both in CBC and with groups of people in Arcatao and Los Pozos. The part of the project I participated in was carried out together with researchers from CBC in the Salsita-project. Most of the time we were two researchers from the research team interviewing one main local project participant. Seeing it from an action research perspective, we have then been at least three co-researchers creating knowledge together in each interview (Reason & Bradbury 2006). The interviews have happened in people’s homes and gardens most of the time, with other family members and guests popping in and out contributing to the interviews in different ways. As a result of this the interviews have been loosely constructed conversations with the aim of creating awareness and knowledge about the participant’s relationship to the concepts of climate change and adaptation.

Once we came to a family, we had not been able to reach them for several meetings, and the photos to be discussed were not about climate change at all. The family had been away because of their grandmother’s death and funeral, and they showed photos of this event
instead of photos of climate change, very understandably. This showed both the difficulty but also the potential of working with photos this way. Getting photos that are unexpected can enlighten the questions in a whole new way. What do people normally take photos of if not the most special days and events of their lives? Perhaps mainly of the good ones but also of the days of grief and difficulty, like a funeral. Especially one photo of their grandfather and four of his grandchildren struck me as a symbol of the change we are looking for in the photos, the change of generations. Climate change affects people’s personal life, they feel the time passing, they feel the increasing heat or the lack of rain, and they struggle with agriculture and livelihoods. In the end what people care about is each other, friends and family. A funeral is an event of change, from life to death, and what people do is get together and celebrate, grieve and remember. These reflections came about after a discussion in the research team about whether we just got photos we had asked for. A methodological problem can arise when expectations affect the process and answers in the process, in this case in form of photos. Very many of the photos we received presented pictures of nature, and no people. Current approaches, discourses and images of climate change presents nature as the centre of the problem. Bringing people literally into the picture and reflecting on people’s role in climate change is part of what is missing in current strategies of adaptation.

The question of how to analyze the photos and interviews is difficult and interesting because they tell so many different stories about people’s everyday life and interior on so many levels. A co-researcher in CBC explained about a specific photo of many small coffee plants in plastic bags; “they grow the sprouts like this in the beginning between October and April, later they plant them in a new plantation. From this photo we can get many layers of information. First, the plastic bags are not new black plastic bags, but reused sugar bags. This shows that sugar is imported and bought from the outside instead of using the sugar that is in the region. In addition there are extremely many bags of sugar; this says something about the sugar consumption here.” The context of the photo was another, the man who took the photo wanted to illustrate how planting new plants were affected by climate change, he could not take the plants out of the bags before rain came. On one occasion we discussed in a group how people had felt during the time using the cameras. People expressed they had learned a lot about the technique of taking pictures, and using the camera. Some thought it was difficult and talked about low self-confidence in using it. They mentioned how it was important to always bring the camera in this process; several times they had come upon something important and did not have the camera at hand. A young man in Arcatao also
talked about how it was after being done with the process with the camera, he later wished the process could have continued. He told us he later thought a lot about the climate change and adaptation question and still found things he wanted to take pictures of. Some also expressed it was easier to take a picture than explaining it. A man in Los Pozos said it like this “the photo remains forever, it creates a reality”.

From an action research perspective the idea that research is participatory makes those who are traditionally called informants out to be co-researchers. The idea is that knowledge is created by all those participating and gives a different ownership to the knowledge that is created (Reason & Bradbury 2006). I will for that reason refer to them as participants rather than informants when presenting the results. Being part of an existing research team and an existing project had many advantages, like being handed co-researchers and connections. At the same time, finding and balancing my own role in the project and gathering data for my own analysis has been challenging. Much was decided for the data without my reflected intentions as to whether the selected case and the participants were representative or biased in any way. It is, however, a working process I try to study and present in this thesis, and the goal is not universal representativeness. Action research focuses on the how the created knowledge should be relevant for those participating from the local community. Making good local adaptation plans in the end was also a goal for the investigation. Staying within the limits of the project and using the offered opportunities, have given me a data material to work with that can contribute to this knowledge creation.

**Practical details around the research process**

All interviews, conversations, meetings and workshops I have participated in, and which is the base for the data material, happened in Spanish without an interpreter. My own knowledge of the language stems from living a year in Spain studying Spanish in 2006 and six months volunteer work in Bolivia in 2009. It is thus quite good, but definitely not perfect. I chose not to involve any external interpreters, believing it would complicate the communication process, and trusting my Spanish to be good enough. At all times during the interviews and workshops I had pen and paper, writing down everything I could of what was said, felt and happened. I also continuously digitalized these notes writing the field diary on my computer almost every day, or every few days. Since I often interviewed together with a co-researcher it was also possible to confirm with them that I indeed had understood what had been going on, after the different interviews and in meetings and workshops. With this opportunity of double
checking I feel confident that the communication and my understanding were sufficiently good. I find it difficult to put down a list with the number of interviews because I feel it would make a false impression of order in a research situation that has been anything but straightforward. The field diary contains so much more of feelings, observations and impressions which would be down prioritized in attention in such a presentation, and these other factors were also immensely important for the presentation and analysis of the data and the results. Kvale & Brinkmann (2009) focus on what is prioritized when discussing transcriptions of qualitative interviews. They question how silence, pauses, noises, hesitation, body language, attitude, and all other important aspects of an interview that easily can disappear on paper should be described in transcriptions. Kvale & Brinkmann (2009) focus on how interviews can help widen your knowledge when using them as the living conversations and the created information that they are, instead of using interview transcriptions as dead written material you have gathered (Kvale & Brinkmann 2009).

Being part of the research team in CBC, I experienced several times to be quoted to other people in the research process both written in minutes after meetings and orally over Skype to the Canadian co-workers. Hearing and especially seeing my own statements on paper and in Spanish made me reflect on the process of interpretation in a process of communication. Often I thought while seeing my own statements that this was not exactly what I had been saying, or had meant. This could perhaps also characterize the feelings of people of whom I write about when or if they read this thesis. What is certain is that an interpretation process happens when listening, when writing down (transcribing), and when it is read again. It is thus important to note that this is representations of real life, but must not be mistaken for absolute truth or absolute reality. A challenge in the research process with respect to communication was that the wording in a research question changed at a point because people didn’t understand the original question. The question that for a little while changed was “what do you do to adapt to the changes” to “what can you do to stop the changes”, a rather important and relevant difference in intentions of the question. It was not a language problem but a problem of not understanding the content of the question. This shows how difficult communicating the research questions can be, what seems logical and well thought through in the office does not work in the field, and the practical turns you take in the field sometimes alters the intention from the research design. The change could also reflect on different subjective interpretations within the research team. The challenge was solved by discussing
and rephrasing the question in the research team, and as far as my knowledge goes it was later reformulated again to the original intention.

A common method to get information as close to reality as possible from a field work situation is to use a tape recorder. This was also why I bought a tape recorder and brought it to El Salvador, however I used it only once while doing field work. The main reason for not using the tape recorder in the field was that I was told by a co-researcher that we could not use such devices because of post-war trauma. The local communities north in Chalatenango were FMLN-land during the civil war and suffered great losses in the conflict. Running around with tape recorders could easily bring up fear and memories of being controlled and watched. Later I observed other co-researchers using tape recorders with no problem. I still knew that they had a better knowledge than me about what was okay and not, and they knew the participants better, so I never took the chance of using the tape recorder. At times I also experienced difficulty with taking notes during interviews, sometimes because it was rude to sit taking notes when people were talking about very personal experiences. Other times it was problematic because it made people nervous. A young couple always became very uneasy when we took notes while they were talking, as opposed to the local teacher who are used to, and perhaps even expect, people showing such attention while she was talking. Such incidents made me reflect on the ethical situation in the research process. Even though action research philosophy intends all to be co-researchers and equal in the research process there will always be someone in charge, someone who starts asking the questions. Such a power relationship is also important to remember and to balance. It is thus important also in action research to honor this balance when planning and executing an investigation. Whether I succeeded with this in the research process myself, I am honestly not sure.

**Outside factors affecting the research process**

CBC is centered in San Salvador, the capital, a long journey from Arcatao which is situated north in Chalatenango, on the border of Honduras. We travelled all weekends and sometimes stayed during the week while interviewing and doing workshops. At times what affected the interviews were when they were set at times after people’s long hard work days and after the research team arriving after a long journey, sometimes including hours of walking to get there. A challenge in the field was to reach people. People could suddenly be gone when we came to visit for many different reasons. One very practical reason is that many of the participants were farmers and live from the earth, and was it weather to sow just that day, that
is what they had to do, regardless any appointment with a research team wanting to progress. That was of course understandable and very important to respect. A great challenge for me as an inexperienced Norwegian researcher was what one of my co-researchers called “Latin-American flexibility”. The understanding of time and appointments differs somewhat, not only between the different cultures but also within the local communities. It is not like every person in Latin-America or El Salvador does not care about time and appointments, but there was a system I absolutely did not understand and never got the hang of in form of what was acceptably late, or what was etiquette when missing a made appointment. Lacking infrastructure in telecommunications also contributed to this challenge. My frustration about this was just as much with the whole situation and the culture crash with my co-researchers, as well as with the other participants. Especially since travelling and infrastructure made the journeys long and unpredictable; it was frustrating to feel that we sometimes missed out on interview opportunities because of such types of misunderstandings. A question in research is objectivity versus subjectivity. A researcher will always have a subjective starting point from her own experiences and worldviews, certain expectations and a comfort zone in relation to exploring a phenomenon, even when trying to construct objective knowledge. One’s own limits can also be difficult to reflect upon. Staying within one’s own comfort zone is much easier than going out and beyond. Studying and developing solutions to effects of climate change will also demand researchers to question own values and worldviews, and outer factors challenging the research process does not make such processes any easier.

The time of my stay in El Salvador was just in the end of summer (dry period) and during May it normally changes to winter (rainy period). How this influenced the research practically and in the themes people talked about is important. Since the rainy winter is expected in May I was urged by people who knew Salvadoran climate to go as early as possible, this made me leave Norway in the end of April. Knowledge of insecure dirt roads, stories about bridges disappearing during last year’s floods and other types of extremes prepared me mentally for a difficult field stay, especially towards the end. It was however, the silent catastrophe of heat and drought that met me during the field stay. In regards to security of transportation in the field this was lucky for me, but the consequences for the local communities were severe and influenced the photos and the interviews. I arrived at a time they normally start sowing, but problems with heat and drought postponed the sowing date. Details of this will be presented in chapter 5.
Ethics in the research process

As mentioned earlier it is important to remember the power relationship in a research process and how this affects the research, even in an action research methods promoting equality. Qualitative methods, and especially action research requires close contact between people. The ethical dimensions around power relationships in research are thus important to reflect on (Marshall & Rossman 2010). Even though action research intends to create a more equal research process uniting researcher and academia with local lay knowledge, there are still challenges that need reflection. The person or researcher that has started the project will have power in choosing and defining the project, location, other participants, and way of working even with the wish of acknowledging all sides as equals. In this case the researcher also makes all choices of what and how the data will be analyzed and presented. This is perhaps often different in other action research processes where more of the co-researchers participate also in this phase. This power relation makes it important to discuss ethics around the whole research process from data gathering to data interpretation and presentation. The researcher has a responsibility not to abuse power, and to safeguard other participant’s integrity, anonymity and generally treat all involved with respect. As one of the overarching principles of ethics, it is crucial to sound research to do no harm (Marshall & Rossman 2010). This position promotes an ethical view that claims that the value of the research is not worth destroying people or communities in the process. I would also claim that this position ensures the possibility of doing future research and is worth following as far as possible, and most certainly in a master thesis when the researcher is inexperienced and new to the research in general.

I choose to make all co-researchers and participants in the project anonymous in the writing of the thesis. The reason for deciding this is not obvious. The people, who have worked and contributed to the Salsita-project as a whole, and by this have contributed to my thesis, are strong and knowledgeable people who I feel should be accredited for their participation. In the Salsita-project several participants are portrayed in the pictures from the PhotoVoice methods that have been used in the project. These photos have been presented through several parts of the project like during action dialogues, knowledge exchanges and photo exhibitions. Protecting people’s identities in that situation is difficult, and in a way it might even be disrespectful not to mention any names. Many of the statements and the theme of climate change as a whole could be seen as relatively non-controversial. At the same time some of the information is very personal, it touches upon private feelings and personal stories also
involving an armed conflict in the past. Thus, to be sure that no one feels they have shared too much and to protect their privacy I choose to leave out peoples real names in the presentation of the data. I do however mention the names of the local communities because it matters to the context of the data, and realize the double standards because it could be relatively easy to find out who the participants are. I still justify this by arguing that it is mainly a matter of protecting privacy rather than identity that is the goal.

It is a central ethical principle that participation in research must be voluntary and should be a conscious decision, and informed consent is one way of ensuring this (Johannesen et al 2010). Obtaining an informed consent from the researched participants requires that the researcher explains what the study is about, and ensures the participant’s anonymity as well as the participant’s possibility of withdrawing during research. In theory, the potential research participants can then decide whether or not to participate and give their consent orally or by signing a form. Being part of an already existing project where the interview process had started before I arrived, I never asked for informed consent from any of the participants, assuming this had already been done. How this was done formally I am not sure, but I trust all the participants were well aware they were participating in a research project since this required quite active participation. Some also dropped out during the process for different reasons so the freedom to do that was also present. An important detail in the field was to always present the research project as an investigation to the participants and other local people, and never as a project. The use of words here were important because several Spanish and North-American NGOs work in the zone, and the word project implies money and concrete benefits for those participating. Since we had nothing of the sort to offer, and it is an important point that people participate in research voluntarily we were consequent on this to not create any misunderstandings.

**Trustworthiness of the analysis**

Discussing trustworthiness of a study addresses a methodological issue as well as an ethical consideration. Marshall & Rossman (2010) claim that an important ethical concern is on how solid grounds the researcher draw her conclusions. Transparency in the research process and honesty about errors in the research process is important to be able to judge the trustworthiness of the data and the conclusions. Often a methodological discussion will do that, and intend to conclude as to how different factors have affected the data and conclusions. The trustworthiness concept might be compared to the concept of reliability (Marshall &
According to Thagaard (2009) reliability is whether the research is conducted in a credible and trustful manner, like making the research process transparent, and being able to check whether it is possible to replicate. Also the concept of validity questions the legitimacy of the interpretations, and asks whether the results are comparable with reality; in however way reality is understood (Thagaard 2009). Both these concepts are made for quantitative positivistic research rather than qualitative data. Replacing reliability with trustworthiness can affect how we see qualitative research as something unique rather than trying to compare it with quantitative research and use the same standards of measuring them, when this is impossible (Marshall & Rossman 2010). This is a qualitative research design presenting the data as a case study. It has earlier in the methods chapter been describes as an explorative single case. This methods chapter has intended to shed light on different factors that have affected the data and the analysis to ensure the transparency needed for this to be a trustworthy study. A good reason for using the trustworthy measurement instead of the validity and reliability measurement in this study is that I do not believe the research process is possible to replicate. That is because of the many specific events and circumstances laying the foundation for this specific data material.

Analyzing the data

Johannessen et al (2010) claim the real ethical challenges come when presenting the data, because that is when the researcher has to make up for errors in the former processes to ensure the study is ethically just. The first that must be done when analyzing data in qualitative research is reducing the amount of information and make a framework that can present the data understandably. Analysis means splitting up into smaller elements, the goal is to find a message or a pattern (Johannessen et al 2010). The starting point in this qualitative analysis is the oral statements and stories from interviews based on the taken photos that after the interviews, meetings and workshops were transcribed into the field diary. I started by organizing the data from the field diary into profiles on each person who were the head of family and responsible for the camera in each household. Each person’s profile contained the information and statements from this person and his/her family chronologically so that each profile showed the whole interview process creating a story. This was the first attempt to find patterns and information from the data. Then I began categorizing the same data according to three themes I had seen emerge, to be able to compare similarities between the stories and statements instead of looking for answers only within the story of each person. The three categories were:
1. Local observations about the weather and climate change
2. Personal stories from the war and post-war life in Arcatao and Los Pozos
3. Description of foundation for, ways of working, tools and methods of the CBC

Since the data tells such complex stories I did not use any technical data program, as I felt it was important to keep myself as a researcher in the process of analyzing and interpreting the data. From the first category I constructed the presentation of the stories of how people feel about and deal with climate change in their daily life. From the second category I constructed the presentation of local war stories to make visible the historic context of Arcatao and Los Pozos, and to analyze and discuss why they are important questions and stories in climate change research. From the third category I constructed the descriptions of how CBC work and the way the investigation has played out, to reflect on how this contributes to knowledge creation about climate change. Constructing the presentation of the stories from these three categories, I also went over the original text of the field diary again to see what had been forgotten and left out before finishing. Looking at the data organized in different categories based on first people’s profiles, then on themes, and at last going through the original presentation again helped to analyze and make meaning of the data. The stories and analysis will be presented in the next chapter.

The methods described in this chapter based on action research is an important part of finding out how climate change adaptation processes better can connect with local realities and engage people as subjects of change. Taking up the thread from chapter 3 on how a conscientization process is needed to create awareness, feelings of responsibility and action, action research is a method enabling the start of such a process. The next chapter will start presenting and analyzing the data and results of the adaptation work of CBC in Arcatao and Los Pozos gathered with the methods of action research.
Chapter 5 A broader approach to climate change adaptation

Climate change does not necessarily signify the end of the world, as much of current climate change discourse would lead one to believe, but it will result in many challenges in environmental and social systems. The reach of climate change will be global, and it could also become one of the impetuses for radical change in societies (O’Brien 2009). Nelson (2009) argues this change must be a dynamic process that emerges from many small individual actions. El Salvador is a country where people already feel the impacts of climate change. Since climate change is a global phenomenon, and El Salvador is not a country responsible for large parts of the emissions that cause global warming, adaptation as response to the changes seems to be the only measure of action people there can do. Adaptation can, however, be part of finding solutions to wider environmental and social issues, addressing underlying vulnerability linking environmental interests also with other interests than economic ones. Many of the discussions in ongoing research focus on the technological, financial and institutional barriers to successful adaptation, and it is believed that overcoming these barriers will make societies more capable of adapting to climate change (O’Brien 2009). However, there are many subjective barriers to adaptation that influences motivation and capacity to respond. A challenge in climate change adaptation seems to be to take into account how subjective aspects like culture, values and worldviews influence responses (O’Brien 2009). These factors also affect human agency and leadership in the process of adaptation.

The challenges in climate change adaptation contain many different components. Current approaches to adaptation focus on certain types of measures that address specific impacts such as improving infrastructure or construct devices to monitor the weather more closely. This thesis argues that these actions are not enough to connect with local realities adapting to the impacts of climate change. Presenting the stories from the fieldwork in Arcatao and Los Pozos, and analyzing what are technical and adaptive elements in an adaptation process, can show the differences between current adaptation approaches and the needed new approaches. The data material presented in this chapter is written down in form of stories and quotes that each tells something about how it is possible to connect with local realities in an adaptation process in practice. This chapter continue to address the research sub-question; “How can connecting with local realities in an adaptation process be realized in practice?” As mentioned in chapter 4 it is important to note that a large part of the answer to this question also lies in the methods of the research; thus from the philosophic and practical action
This chapter will argue that to help people and local communities to become able to do more than just react to change inflicted on them, it is important to approach climate change adaptation as an adaptive challenge. This chapter is built up as an analysis of what are technical elements and what are adaptive elements in the adaptation challenges in the local communities of Arcatao and Los Pozos. First the results of the adaptation investigation in Arcatao and Los Pozos will be presented, and then the technical elements and how these are taken care of in current approaches to adaptation will be focused on. Illustrating how the CBC approach goes deeper into understanding people’s everyday life, the adaptive elements and the importance of the focus of CBC will then be identified. Finally it will be discussed how both technical and adaptive elements can be integrated into a new approach.

Experiences of climate change – daily challenges

The stories about environmental change were told during the month of May 2011, a time when the seasonal change from dry summer to wet winter normally occurs. This is also the time when farmers start sowing the first crops of corn and beans of the season. The months of April and May 2011 were affected by a dry spell due to a delayed start of the rainy season in El Salvador. The local experience of this climatic event and the responses to it can be seen in the statement “Only God knows when rain will fall”. People did not know what was happening, or how to handle it, which showed in the stories about their everyday life. Several of the taken photos portrayed dried out rivers and empty water sources. One story was about a picture that a woman had taken on her way to look for the animals. It portrayed a place where people used to go to rest and drink, but she explained this was not possible anymore. “I feel bad about it; water is essential to life, now you have to go with a bottle of water because you cannot find natural water”. An elder gentleman also talked about how the water sources on his land had dried up. It was a problem because it was hard to get enough water for the animals in the field. Luckily his family had a reserve well on their land. Access to water also affects many parts of people’s livelihoods. “We cannot fish if the river is not clean, because we do not see the fish. The vegetation affects the water. With deforestation the water changes its paths, the water goes down in the ground” This statement shows how human action in one area affect their surroundings which again affect the human activity in using natural resources in another area. Awareness about this might help in local resource use and to create local adaptation measures.
A subject there was a lot of talk about was the increasing heat. People saw it as a problem because plants dry up. Especially trees close to where people live have dried up, while trees further away have survived better. A lot of the trees have been cut down to grow food. Many families have also had orange trees in their gardens; many of these haven’t survived the heat the last couple of years. A co-researcher explained “What many people don’t know is that these orange trees in people’s gardens were imported to El Salvador during the green revolution. They now die from a plague that comes from the warmer weather. About two years ago the plague killing the orange trees came to the high areas. The orange trees were introduced by the World Bank and are called Washinton Nabel”. Using new species, maybe even genetically engineered species can be seen as adaptation. The danger is that such adaptation measures do not consider sustainability across temporal and spatial boundaries, and such adaptation measures could cause unexpected problems in a long term perspective.

A problem when they built the road that connects Arcatao with Chalatenango and the rest of the world is that they cut down a lot of trees in the process. Without motorized transport the walk is long and hot to endure. Another problem is that the trees used to provide shadow, and with their removal, people now feel the heat from the sun more severely. A farmer explained about the increasing heat: “We cannot work in the afternoon anymore because it is too hot. Earlier one worked from 6 a.m. to 6 p.m. with machete. Now everyone uses pesticides, because the land dries up after you burn”. These statements show how vulnerability and human action in adaptation processes can affect the long term sustainability aspect related to adaptation. “People adapt little by little. Now, when it is so hot for example, people build their houses taller, so that it will be cooler inside”, is also a statement that represents how a need for change and adaptation can be answered. People are also affected by the heat with headaches and rashes. In one family the chickens got a disease they suspected came from the heat. Several photos are of the family’s children, bathing to cool down in the heat, without clothes due to the heat. “I am affected by climate change and the new generations will be even more affected, it is my grandchildren and the young ones that will suffer. My time is nearly over”, said an old man showing a picture of his granddaughter. Such a statement shows what is often forgotten in current climate change adaptation work; the long time perspective and the future.

The most severe impacts of the heat and drought were on the agricultural sector. “April 25th has traditionally been the first day to sow; now it is not possible because we do not know
when the rain will fall”. This statement came independently from two elder men, each respected in their local community. In 2011 the farmers had to wait to sow until it started raining. In the previous year the crops failed because of too much rain, the corn crops were destroyed. Some had seeds saved up from the year before to plant that year, and managed independently. Other families were dependent on family members or loans from the government to get seeds to plant this season. June 10th a man in Los Pozos showed a picture of a dried up well: “This is a place that normally has water this time of year, but we have only seen one rainstorm. Normally by now it should have rained for ten days and this would be full. The corn should have started growing by now, but it is not even planted yet. We feel bad because next year we will have no crop. It does not just affect our family. Right now we might not notice it, but it will come. We plant crops of beans twice a year. When the first is late we might not be able to plant the second one”. A man in Arcatao had told us five days earlier that he finally had sown. He had thought it would start raining, but it did not start after all and the corn dried up and died. The alternative was to sow again but that would mean more expenses and a late harvest. Another man in Arcatao said: “This is the first year I sow in June, but then again I haven’t lived here that long. There is an old saying, if you sow after June 11th the crop will be different; that is knowledge from the elder”. A picture of two small children having their daily dinner shows a concrete result of the crop losses. They have each a plate of cheese, tortilla and corn but because of the bad winter last year they lost the bean crop, now there are no beans for dinner. The result of this year’s weather and failing crops is likely to cause a lack of corn at next year’s dinner tables as well. “This is climate change to me”, said their mother who had taken the picture.

The rainy season in 2011 was expected by the locals to be more severe as winters have been for the few last years. During the rainy season of 2010 the River Sumpul flooded, and people had a difficult time to get to the memory service for the massacre in Las Aradas, which will be explained more about further down. The trees, vegetation and infrastructure were completely destroyed by the extreme rise of the water level in the river. Enormous trees fell over and the vegetation, meters over the river, was completely washed away. An old bridge disappeared and people talked about never having seen anything like it. Every winter the bridge between the centre of Arcatao and La Colonia, another part of the town, is flooded and there is no way out, only to the mountains. In Los Pozos a women told that she could not get to work in the neighboring town when the water level in the river next to her house rose. The water floods scared her and she was expecting it to happen again. As described in chapter 2,
the rainy season of 2011 also came with extreme weather that caused large damages to people and infrastructure in El Salvador when it first came. Chapter 2 on background from El Salvador told the story of the flood disaster that occurred October 2011, hence after this fieldwork was over. There was a sense in Arcatao and Los Pozos that extremes are becoming more extreme and many people experience increased uncertainty about future weather. People have had a hard time adjusting to the insecure weather. They do not know how to adapt their agriculture to it. People have the habit of sowing the first crop of the year in April/May, and when it doesn’t rain people get confused. They sow in desperation when it looks like it is going to rain and lose the crops. Many of the people in rural areas live in close contact with nature and are directly dependent on weather and climate for crops and livelihoods. In the studies from Arcatao and Los Pozos it is visible how irregularities in amount of water in the landscape can affect whether people can go to work or school, whether they can fish, and whether they get the food and seeds they need for daily and future use. Climate change in form of increased temperatures affects how people move; they cannot go that far without bottled water and sun protection, and cannot work the same amount of time as earlier because it is too hot. This creates a situation where people become more dependent on technical help and solutions, such as systems regulating water or artificial pesticides.

The stories of drying water sources are often mixed up with stories of how people burn the land for agricultural purposes. Several people connect the practice of burning in agriculture to climate change, drought and loss of crops. “One must not burn because then everything dries, erosion comes, more dust comes and makes people sick. They burn close to water sources and that is why it dries. After having burned, the sun shines directly on the earth, the water evaporates and it causes more diseases”. It is supposedly illegal to burn land like that, but practicing this rule is difficult. The local community tells people not to do it, but that is all, they don’t impose it: “If one person is to get a fine, everyone must get one. And if one person is allowed to burn, everyone must be allowed”. The fire also kills rats that otherwise would eat the seeds if sowing without burning. Another argument is that burning is at least better than using poison and pesticides. Those opposing to burning argue that “where you don’t burn, grass will grow, this gives nutrition to the earth, you don’t have to use a lot of artificial nutrition, you need more of that when you burn”, a statement that can show how people see the same phenomenon or reality in different ways, and where this perception forms how people behave. A possibility is to grow trees and let the earth rest. After burning there are no trees, it is clean, and this creates an increased danger of landslides when it rains because there
is no protection. It is possible to build barriers, living or dead, to prevent the landslides and to prevent the water from disappearing. “We are farmers and live from the land, thus we must also take care of it. To burn is to destroy the nutrition in the earth; other plants would give new nutrition. The earth is like a pregnant woman, it needs nutrition, attendance and affection. To take care of the earth is taking care of the future”. Adaptation in agricultural practices touches upon one of the most basic needs for all humans, food. Agriculture and food production is also affected strongly by traditions, culture and individual preferences. It is a perfect example of how applying technical solutions to problems also must take subjectivity and adaptive elements into consideration.

The stories people tell of being affected by changes in the climate, also shows the relationship between people and their surroundings, and how they affect it as well. People talk about how it is getting warmer and dryer, and about the consequences of that. The contrast between losing crops from floods one year to losing crops from drought the next year also shows the insecurity affecting the social differences in how people cope with the difficulties; differential vulnerability. Some families have seeds saved up. Some have not and need help from extended family, social networks and when possible government distribution programs. Being prepared only helps to a certain extent though; is the catastrophe severe enough such safety nets, although helpful, will not be sufficient. Since the goal in this thesis is to explore how to engage people to deal with such a complex challenge as climate change adaptation, it is useful to develop an understanding of how this vulnerability affects action, which again can affect climate change. It is important not to make out people as victims, but as agents able to act and affect their local surroundings. With Nelson (2009) arguing that change in systems must come from individual actions, it is possible to conclude that adaptation and action on the local level can contribute to changes in regional, national and global levels. While much vulnerability is related to systems and structures seemingly beyond the control of an individual or a community, human agency can contribute to vulnerability reduction as well as climate justice. A part of the vulnerability which must not be forgotten is the inability of people to understand their own role in affecting the environment. Understanding this connection could possibly contribute to engagement with climate change adaptation.
Current approach solutions – technical elements

The stories above suggest that people are adapting but will need to adapt more in the future. There are also many different factors, obvious and not so obvious, contributing to vulnerability. Studying the data of people’s experiences with climate change in the last section, current approaches to climate change adaptation would focus factors like the lacking infrastructure in the local communities. The main road leading from community to community ending up in the larger town of Chalatenango is vulnerable to heavy rain and large amounts of water that can create flood and landsides. The state of the infrastructure make travels long in this small country with relative short distances because people are dependent on walking when there is no bus or other transportation. The road to Arcatao was being reconstructed during the spring of 2011 by a development plan called Plan Puebla Panama. The project is part of a regional Central-American strategy to promote integration and development between South and North America (Pickard 2002). The stories heard about the project reflected that the people in the local communities where the road were to pass, were not satisfied with it, experiencing this as just another neo-liberal project thinking of economic benefits for the elite. Surely this opinion came into conflict with other opinions of people who saw the potential and opportunities of a good road in the region. Another example of lacking infrastructure is how many bridges are flooded in the rainy season; examples are the collapse of the bridge on the road leading to Arcatao in 2010, and in 2011 in Suchitoto (Ghosh 2012), both due to extreme weather with surprising masses of water. After this event in 2011 the Norwegian Development Minister Erik Solheim visited El Salvador, and donated money to reconstruction of the bridge in Suchitoto (Ghosh 2012). This is another example of symptoms relief instead of dealing with the larger problem, important but not enough. Floods also make smaller bridges impossible to cross in the winter during the rainy season even when they don’t break, and stop people from getting to work and school, or even getting from one part of town to the other. Another part of lacking infrastructure is there is no space good or large enough to store and secure food and seed; so people are dependent on social networks when their crops are destroyed.

The challenges of too little water or too much water show in different ways. The cutting down of trees makes it warmer and dryer, and it is hard having to walk far without finding shadow or water. Drought affects agriculture and food production suffers from the unstable shifts between floods and drought that destroys crops, seeds and livelihoods. Local farmers in Arcatao and Los Pozos are dependent on the land they cultivate, and depend on good weather
to get good crops. This balance that is easily disturbed both by humans and nature is an example of a vulnerable social-ecological system. The people in the system are vulnerable to losing their livelihood; nature is vulnerable to loosing biodiversity, to erosion and to flood. At the same time the case shows that many people throw garbage everywhere; there is a lack of systems dealing with garbage. This pollutes the local environment, which affects water sources and health of humans and animals. When water sources and sewerage systems are overloaded and polluted, this could cause infectious diseases and become public health issues. The IPCC chapter on Latin-America in the fourth assessment report (Magrin et al 2007) focuses on the adaptation measures of technology and better weather forecasts to be prepared and better deal with surprises. This is an important measure but it is possible to argue that places like Arcatao and Los Pozos might not be prioritized in this conflict of resources. The county of Chalatenango is located north in El Salvador, in the mountainous region on the border of Honduras. El Salvador is a country with limited resources when it comes to implementing adaptation measures and often the coastal areas seems to be prioritized in national adaption plans (UNDP 2009). Such measures will also only reach some communities, and the marginalized and most vulnerable are still missing out. In addition this is not a solution to the larger problem, knowing about a drought, a flood or a hurricane will only help to a certain extent. It cannot make rain fall to save crops, and even the best technological irrigation systems are of no use if there isn’t any source of usable water in the first place.

These are problems you could argue have technical elements in their solutions. According to Heifetz (2009) technical solutions are known solutions that can be implemented with current knowhow. The technical solutions are to improve infrastructure, build stronger and better roads and bridges, and planting trees as an answer to problems of flood and erosion. Technical solutions are creating local groups collecting garbage and caring for local water sources, spreading information on the threats of burning, or maybe making a law to prohibit such actions. These are necessary and good measures, but a problem that arises in such approaches is that people do not necessarily have the whole picture in mind when planning the measures. Adaptation strategies can be said to go wrong when the source of the problem never is addressed, all that is done is relieving symptoms. Building a stronger road and a larger bridge is basically a good idea, but what kind of catastrophe could be created if for example the natural ways of water in the landscape are forgotten, in addition to people having cut down vegetation around this new strong infrastructure. Adaptation measures made with
good intentions could go wrong without a holistic perspective, and the dangers of never addressing the real source of the problem will sooner or later become evident.

Adaptation strategies sometimes lead to building in areas that should not be built in. And it is the poorest that are forced out into the most exposed areas, with the least fertile soil, and become most vulnerable to disasters. In a situation where it might be necessary to relocate people either temporarily due to a surprise catastrophe, or even permanently due to irreversible changes, the knowledge of how this affected people during the war can be of use. People in Arcatao and Los Pozos experienced being forced away from their homes during the armed conflict and what they seemed to miss was the security of being at “home” with family and friends, examples of this will come in the next section. Relocating people as a solution without thinking of the wider consequences could create a situation where vulnerability is decreased only in a way of securing food and shelter, but not in ways of being able to live decent fulfilling lives that social security provides. In current understandings of sustainability the concept is often divided into parts like economic, social and ecological sustainability as if the three have nothing to do with each other. The connection that economic and social goals will not be fulfilled in the future if we extract all ecological resources now seems often to be neglected and ignored on behalf of short-term well-being. Adaptation that does not take this into consideration will never be able to address the real problems of climate change and find a long term solution to vulnerability for the poorest. Adaptation measures like trying to regulate water can even prove to cause other problems for other communities, something it is important to be aware of. This creates situations in adaptation that brings out conflicts of interests. Addressing the problem of sustainability is perhaps the ultimate adaptive challenge.

The lack of adequate adaptation strategies in Latin American countries to cope with the hazards and risks of floods and droughts is often attributed to low gross national product, the increasing population settling in vulnerable areas and the absence of the appropriate political, institutional and technological framework, claims the IPCC chapter on Latin America in the fourth assessment report (Magrin et al 2007). This is one side of the truth; another side is it is necessary to stop reducing environmental problems to a conflict of money and resources. An adaptation strategy implemented in a local context coming from outside the local community could succeed or fail due to people’s capacity to relate it to their existing everyday life. This will be explored further through the alternative approach to adaptation of Centro Bartolome de las Casas (CBC).
Going deeper: The CBC approach to adaptation

A reason it is important to explore people's relationship with climate change subjectively, instead of just constructing climate models and plans for what is about to happen, is the different experiences and views on climate change. The themes that came up in the dialogues and photos did not always present climate change in the way that the researchers or the other participants experience and described climate change. Some of the participants pointed out this difference when talking about their photos. While some presented how the local environment is damaged by people using burning in agriculture as climate change, others presented this as a local environmental problem that does not have anything to do with climate change. The fact that someone will present a local environmental problem like burned down vegetation as climate change, illustrates the importance of a close connection to one's immediate surroundings to understand how people affect nature and ecology. The complex causal relationships leading to climate change are hard to grasp for any human being, and perhaps even more difficult for people living in communities and societies with a larger distance between their everyday life and the effects their actions have on nature and climate change. The seriousness of this assumption becomes evident when arguing that it is people in the western world who need to cut emissions and consumption, not people living in countries like El Salvador. Presenting the adaptation approach of CBC is important to understand how connecting with people's local realities can be realized in practice. As pointed out before, much of the answer lies in the methods of action research, and the philosophic foundation that CBC bases their work on. In one of the introductory conversations we had in the CBC they talked about their work with the use of stories and symbols. In the CBC office there is a conversation room with chairs set in a circle, and on the floor between the chairs is a cloth decorated by words sown in with different colors. This is a bag of jute, decorated with colorful threads, telling stories of the different themes and emotions the CBC work with.

"Jute is a material from a coarse vegetable traditionally used to make Jute Sacks. It is used widely, especially in coffee production as bags for the coffee. It has a symbolic significance to us; it is something that is used and thrown away, when worn you can create a new one. This is a symbol of how we work with what has been forgotten and abandoned".

Using such type of symbols is often unfamiliar to people with a western worldview, and it could take some time and reflection before people who are not familiar with this kind of thinking realize the potential of communicating challenging themes with other methods than just words. The office of CBC is located in the historic center of San Salvador in a church.
The current city center of San Salvador is now moved higher up as the city has expanded towards the hillsides, and the richer inhabitants have moved higher up. This historic city center is seen as a frontier between rich and poor, old and new, and also this has a special meaning to the people working in CBC. “This place represents the transit and movement in the city. You can call the center a frontier in the city; here you can find anything and everything. One of the words that decorated the colorful jute cloth was the word umbral, which can be translated to threshold. It describes the position of the CBC. “This is the middle position and opens some doors and closes others. We are criticized for being apolitical, but the intention is to reach where others do not. We are not inside, neither outside; it is dialogue that is important. The Salvadoran society is extremely polarized and we believe cooperation is the key”.

Another important word in CBC is participation, something that needs thorough discussion in climate change adaptation as well as in democracy and politics. “Participation is often difficult for people. In the conflict, and earlier historically, people had to obey authority figures; this is the mentality in El Salvador. To demand participation can also be tyranny for those who do not want to participate”. About the focus in their work people in CBC say: “There is little focus on what people feel, why people do survive, and how to measure those factors. Embodiment is important; people's bodies and people's emotions are connected”. This is an aspect that is lacking in current climate change adaptation. Climate change adaptation can with current approaches be seen as a conflict, a conflict between different interests, and a conflict about money and for defining sustainability. Who and what will be prioritized in international policies and national adaptation plans? In such a game there will be some winners but probably more losers. Finding compromises and working out plans and measures that can see the whole picture and make the different interests in the conflict benefit demands a focus like the one of CBC. The thought of standing in the middle positions to reach as many as possible is crucial in El Salvador, as well as in the world with so many different interests at several levels. Standing in the middle position is also necessary when trying to understand how people’s everyday worries and context can be connected to climate change.

Frames of references – The war

The climate change adaptation approach of CBC focus a great deal on the experiences of local people in Arcatao and Los Pozos and on the context of a history with civil war. Most people in Arcatao and Los Pozos have direct experiences from a brutal civil war. The stories of how
they lived and survived during the conflict tell us something about how people get through
difficult times and why. For someone from the outside many people appear to live in poverty
in Arcatao today. Comparing it with how people suffered from lack of food hiding in the
caves in the mountains during the conflict, the difference in standards of living is enormous.
Understanding the context of war that people in El Salvador still experience in form of a very
present past, helps understanding what is important to people. Hearing and understanding the
stories about surviving the armed conflict, and how people relate to those experiences now,
can make it easier to connect with peoples realities and create awareness about climate
change. People did not just survive an armed conflict; they use these experiences today to
develop the local community.

Arcatao was an important battle field during the armed conflict. In the north and east of El
Salvador FMLN were in control, something that is visible still. The Sumpul River going into
the Lempa River, a river that must be crossed on the way to Arcatao, was a frontier and has a
heavy symbolic meaning to local people in the region. In addition this river is the main fresh
water source for 80% of the country. In Arcatao there is a local war history museum created
to preserve memories of what happened there during the conflict. I was shown around the
museum by an ex-combatant who experienced the war herself, and who has been part of
establishing the museum. She started her story by telling about how Arcatao used to be before
even the road came along. “People lived from growing coffee and it was hard work. In 1975
people started organizing, people had started disappearing, and a local teacher had been
killed. In 1982 the government army sent thousands of soldiers to massacre the local
communities. The attack on the town made all the inhabitants flee to the mountains to live in
the caves. From 1980-86 Arcatao was a ghost town and the numbers of child mortality were
especially high due to hunger. A lot of young people died”. The serious poverty during the
war is still present mentally in form of jokes and stories of people overjoyed by being able to
buy just one shoe, or about huge personal fights when two sisters each find one shoe from a
pair and won’t give up their part. Living in the mountains they had to hide the wounded, and
heal people only from reading a medical book they had. The women who acted like nurses in
the field did an enormous effort. So many children and adults disappeared and died, many are
still missing, and there have been made committees to help find missing people. “During the
war we had to organize to fight, we had no weapons, we had to find them or make them as we
went along. The weapons found after the war is evidence that USA paid and supported the
war in El Salvador”. Several of the local co-researchers are people who are important when it comes to carrying on the heritage of solidarity and memory from the armed conflict.

A statement from a woman in Arcatao during a conversation about dealing with different kinds of difficulties explained; “We live with these changes because we have to, the changes came, we had to move, now we have to adjust to the surprises that come, we have to live with what touches us”. This was after describing how her family was forced from Arcatao to a refugee camp in Honduras, and had to stay there for four years. She could relate to dealing with the surprises and unpredictability to dealing with today’s surprises and uncertainty. A common result of both challenges was lack of food, loss of livelihood and an insecure everyday life. The threats came from different places, but it was, and still is, about survival.

A part of the museum in Arcatao has the word Memoria written on the ground from white painted stones. Memoria can be translated to memory, but this concept stands for something more than just memories of what happened to the creators of the museum and the local people in Arcatao. “Returning to the town we brought small rocks from the areas where massacres and killings had happened, we could not bring the bodies, they were often buried where they fell”. The Memory Committee is one of those organizations working with this heritage of the war. In 2011 the committee worked a lot with a Tribunal, a social court, arranged to get testimonies about the war. They also work practically with the fact that people lay buried around in the area, and friends and families want their dead back. It is a long process, and it is very present in different areas like in the local Sunday mass, and in different Municipal meetings. The local priest was an important figure during the conflict, so are several of the working mayors in the local communities. The meaning of Memoria will be explored further in the next section.

The war stories can be seen as analogies that can contribute directly to understand how people relate to shocks, trauma and change in general. The experiences and stories people share can also be seen as frames of reference, a context and a viewpoint that affect how people see the world and act in it (Atherton 2011). The demands on families and local communities during the conflict were severe. A family of several sons could get one called out for the army, another called out by a guerilla group with no possibility to deny either. People did what they had to do to survive. Stories of loyalty conflicts appear a lot, and the threats came from both sides. One story tells of a man in Los Pozos who denied taking the army up to the local mountain Chichilco where the guerilla group was staying, because this would provoke the
guerilla men and they would later kill the families in Los Pozos for revenge. Another story tells of a sergeant from the army who helped local people escape because they had given him and his men food. Threats came from different places, and it was not always clear who would help who, and who were on which side. This seems to be somewhat taboo to talk about, and an assumption that people sometimes express stronger belonging to a certain side now is not completely unrealistic.

Los Pozos is a small local community in Nueva Trinidad, the neighbor county of Arcatao. Also here people had to leave during the conflict, but some came back also during the war. In Los Pozos several of the families are related, it is a small community, and the stories presented here are of several families leaving and coming back together during the armed conflict. Often when they fled, people had to leave without anything but what they were wearing. Once they were let back to fetch some sugar and corn, and were given a certain time before they had to leave again; if they were not out by then they were to be hanged. A few men missed the time only by minutes and paid with their lives. This story was told by several people in three connected families, during several interviews and describes the family’s experiences from the war: “We left by foot in the night, only with a few things. The coast was clear, we had to go. We were many who wanted to go, I don’t know how but we got away. Many had to leave everything when they left. We were some of the last ones leaving, we left for Sonsonate. Everyone had to leave, some to Honduras, and it was hard to communicate. It was no one here for about four years. What was different in Sonsonate was the heat and the coast. The ocean made so much noise. We liked it here (in Los Pozos). It was a risk to come back but we couldn’t stay there, our land was here, we are born here. We had no money to buy land there. We sent some men to check it out and they told us no one was here so it appeared to be possible to come back. We had to come back to the land we had left. It was our land, our home. First, we lived in a small house up there (pointing) because our house was burned down. Three families living in exile in Sonsonate came back during the conflict, in 1987.

We came back in a large group, with chickens and everything. In the years away we had missed to be together as a family. We had to work as much as we could to survive and had never time to talk. Left early in the morning and didn’t see each other. When we heard that others were going back we wanted to go to.
It was bad times; they threw a bomb here after we came back. They had weapons and grenades here in 1987 also. The bombs scared us, and a military company came by and ate all our food. We got no help from no one. We could not buy pesticides. We had some corn and beans to grow, the help came much later. But we had our animals. We had a small cow for milk, and bought more animals and started over in 1987. The earth had gotten to rest while we were away, but a plague of insects came and made it hard. Every Sunday we went to mass. The organization started after we came back from Sonsonate. From 1987 more people came back and the local community started to get a bit more organized. The local priest and some teachers participated. They taught people to read. The army tortured and killed people to get information about whether we had weapons. We had none. People were conscious of being organized and stand together. If people needed help in the middle of the night, they got it, like fetching and helping wounded and communicate with the guerilla soldiers. Some, but not many, joined the guerilla group from here. Most people just helped a little with the nightly favors. Local people gave and sold food to both army soldiers and the guerilla men that came by. What else were they to do? Not that many died during the war, mostly before the war, before we left.

Sometimes people had to go out at night to fetch the wounded. I had soldiers following me to work to observe what I did. It was not allowed to be organized in any way. People did meet and organize, it was important not to have anything written down to not get caught. Soldiers paid attention and harassed people they thought were organized. At the same time the Colonel in the area was mean to his own soldiers, and many were in the army involuntarily. They were forced to do this work and because he treated them badly, they did not always want to do as he said. We had to organize to get everything we have today. The community house, the school, the canteen. That is a victory. The materials were donated by Spain; the community house was built by everyone in the local community. After the signing of the peace agreement the local community was still strong when it came to organization in the local community. People supported in all the services in the church, festivities and marches. Later it was weakened, perhaps mainly since around five years ago. It has a lot to do with people leaving for the north. People leave an empty space when they go, especially people who know something. People leave to find a better economic situation and a better life.”

The stories from the war show how most people were caught in the middle of the conflict. Many of those who fought did so because they had to. Some were forced into the Salvadoran military; others had to go with different guerilla groups. Mostly people just tried to survive.
The first thing they brought with them when they fled was food and seeds to cover basic human needs. This question of food security is the same thing lost with today’s climatic changes affecting the agriculture. The Salvadoran state had to import beans from Ethiopia in 2011, an act that was debated in the media during the spring of 2011. This is often seen as an adaptation measure in current approaches to climate change adaptation. A country with greater purchasing power buys food from a country where four and a half million people were in need of emergency food assistance the same year (WFP 2012). It is adaptation in the way that the Salvadoran state reduces the vulnerability to a certain extent for its own inhabitants, but the question about what it does to the vulnerability of the inhabitants in Ethiopia is not addressed. Neither is the question of the ecological cost of transportation of the beans, or whether those who need the beans in El Salvador can afford them. In regards to what is important to people in a difficult situation Mire (2010) argues that preserving and focusing on cultural heritage is equally important to the practical details around securing access to food and emergency relief in a post-conflict country. Such a focus can help people relate to difficult times that have been, and perhaps will come again. The story about how people deal with the massacre in las Aradas in El Salvador is an example of how people use their cultural heritage to deal with a conflict-filled past, using it to develop the present local communities.

Using the past to build the present

May 14th in 1980, right at the beginning of the war, over 600 (and maybe up to 1000) people were killed in a bloody massacre in las Aradas on the bank of the Sumpul River. Those killed were local people from villages in the northern Chalatenango region, just on the border to Honduras. This border was and has been somewhat undecided and military from both countries went from house to house and chased the Salvadorans out of Honduras and into the war zone of El Salvador. A large group of people who fled into the mountains was chased into the river by the Salvadoran army. On the other side they met the Honduran armed forces. The river was colored red with blood and the area is still full of buried unidentified bodies that few or no one know where are. Many disappeared with the river. Nobody has been able to do anything about it since, in the nearly 20 years of ARENA rule in the country. Every May 14th people from all the surrounding villages gather in Las Aradas for a memory ceremony to remember their fallen friends and family. People walk for hours in the burning sun through difficult terrain to get there, the last obstacle is crossing the Sumpul River. The preparations for the day started early. Banners, flags, balloons and colorful paper decorations were hung up in trees and bushes. A group of people cut sticks, bound them together and made a large altar
for the service. Stones were fetched from the river and painted white, later relatives and friends wrote the names of their lost ones, and the stones were carried to the altar in the memory service. Some went around with lists, collecting signatures of those present, as more and more people were filling up the relatively small shadowy space under the trees in the middle of a sunburned nowhere. The program started while people still were coming walking in from all the villages around. Testimonies from survivors of the massacre, and relatives of those who died, are heard each in their turn over the sound system which was tied up in a tree. Testimonies about how they took her father/son/husband, how they tortured them and how they violated her are heard. “The worst”, described a man, “was the terror and fear the armed forces spread about them. We have to tell these stories and present the war so that it will never happen again.”

Music, song, and several theater plays where young people play out scenes from the war and the massacre were presented before the priest finally could hold his Mass. Dreams were also shared of how they would have liked to restore this place to create an official memorial site for the war there. “This place is already sacred, for here rests our family and friends! What we can ask for is a road so that everyone will be able to get here!” What these stories from the war show is amongst other things a way to connect with what people care about in their everyday life. Such a connection can be explained through exploring the importance of the concept of Memoria.

Connection to local reality

In one workshop in the office of CBC they presented a Map of Power of the region around Arcatao and Los Pozos. The different power factors were for example the church that represents a symbolic form of power over the larger region. The local priest is a man of the Jesuit order that did a lot of good for the communities during and after the war, he is a very popular man and is significant in running the local community. Another power factor is the mayor and the municipality administration, they have formal political power, and it is discussed who of the local mayors who have more or less power and due to what factors. It seems people that had a special role to play during the war are who people listen to now. To be a sobreviviente, a survivor, is hard to compete with. Several of the families we have contact with in the project are people present in local leadership. Especially the women we talk to have this kind of power, they were active during the conflict, as fighters, as
messengers, and as nurses in the field. They are also women of faith, expressed strongly
trough active participation in church activities.

Memoria, to remember the conflict, is said to be the key to connect with people. The research
team experienced this directly at a meeting with one of the local mayors, presenting the
climate change investigation to him. He appeared pretty cold towards the project until we
mentioned the part of including the interior dimensions, community resilience and people’s
experiences from the war. It is a political key; they do not want what happened to happen
again. It is an emotional key, everyone have some experience with and relation to the conflict.
The people who talk about Memoria are known to be strong, they are the leaders, they are
resilient, and people want these leaders. An anthropologist doing research on the post war
communities in the north Chalatenango region claimed during a meeting at the University of
San Salvador “people are proud to have been in the guerilla, the war was a time for
excitement not just suffering, people also had victories. Today’s teachers were formed during
this period, and the young today are an important part of remembering and ritualizing the
memories, they do not forget, they are the ones painting all the murals and those who act out
the feelings in plays on the memorial ceremonies”.

Memoria also affects present conflicts of interests. There are interests in Arcatao who wish to
start a tourist center on the local mountain, La Canada, where people from Arcatao sought
refuge during the war. Others consider this mountain with the caves sacred and oppose such
an idea. Other places in the region that equally important to remember the conflict, are
threatened by mining companies desiring to extract minerals. The mountain is sacred to the
survivors in Arcatao because the place gave protection during the conflict. The caves are
places where people, hid, starved, and survived while friends, neighbors and relatives died
and where several of them are buried. This is an example of how people’s experiences and
histories are connected to the terrain around them. Some describe Memoria as energy.
Sometimes saving natural areas, is not just about saving the ecology but about saving culture
and history as human experiences can be deeply connected with their surroundings. The war
is also important when talking about climate change experiences in Arcatao and Los Pozos.
People relate climatic events to important experiences, like when the flood prevented people
to go to the memorial service in las Aradas. The statement “The Sumpul River during the war
was full of water. There were many smaller rivers that now have dried up”, also shows how
the context affect memories of the nature around people. The Sumpul River was a frontier in
the war; it has great symbolic significance as well as being important as a natural resource of
water to the local communities. Understanding these layers of meaning shows ways of connecting what people care about to climate change. Many people in Arcatao and Los Pozos have their identity strongly connected to the war and to the concept of Memoria. Working in the Memorial Committee, building the museum, keeping up the work with finding missing people, arranging a Tribunal to bring about testimonies, and arranging memory services for the dead shows a capacity that can and should be taken into consideration when planning measures of adaptation.

**A broader approach – combining technical and adaptive elements**

To truly be able to deal with impacts of climate change that results in more than relieving symptoms it is necessary to develop capacity of understanding the theme of climate change and understanding people’s own role in the picture. The climate change adaptation focus of CBC brings out questions around awareness and understanding of such connections in practice. In the action research communication processes it is possible for people to become aware and feel responsible for changes in the environment. How this could prove important will be discussed in the next chapter. Listening to local knowhow and experience, making room for dialogue and exchange of experience in the local community in regards to this, is important. Recognizing the context of personal and social resilience may help people to connecting climate change issues with their daily life and experiences. The stories from the war in El Salvador tell about surviving a living situation stretched to the extreme. Such resilience can be connected to the similar concept of resistance as part of Memoria in the war stories. People in Arcatao and Los Pozos see this as a feeling of being together, working for a cause, feeling the collective community, and being with people who understand and have the same experiences.

People in Arcatao and Los Pozos identify with their home, their land, and the land of their families through the stories of surviving the war. Because of this they build their lives in places which might seem unattractive to others. A co-researcher explained: “**Even the young people who were so young they don’t remember or were born after the war still experienced the war. It is always there as a context and it affects the generations. The theme of the war is a key to open up a magical door to a universe of relations. The war is also a paradox, in Arcatao it led to people creating a name and an identity for themselves and people came with money and help from the outside after the war. Was there even anything there before the war?**” An important lesson from the conflict situation is that a threat can come from different
sides, not just from the obvious one. At the same time possibilities can also appear during uncertain times. For adaptation to be a part of the solution to global environmental problems it is important to take into consideration social aspects of the resilience concept, but maybe more important move beyond the resilience as an answer in adaptation. Connecting with people’s everyday experiences is important either way.

The way current approaches see climate change adaptation is characterized by solving it as a technical challenge. Programs, plans and measures focus on technology and infrastructure, the problem of lacking money and need for resources. The focus on what resources already exist and what it takes for people to change behavior is missing. Theory on adaptive challenges argues that in every organization some people will resist to change, mainly because they benefit from the current way of working. Changing behavior to reach a sustainable future will disturb and change systems that some have an interest in keeping. People, who make money on certain types of technology and current systems, or who desire prestige as a politician in a society built on consumerism, might not benefit from new approaches making real changes.

What is needed is a connection between what people value and experience in their daily life and what many see as an abstract unmanageable problem; climate change. The approach needed then is to see climate change as an adaptive challenge and deal with all the other factors in addition to the technical ones. Not acknowledging the subjective side of human’s relationship to the environment is part of not finding a solution to the problem.

The PhotoVoice methodology is, together with action dialogues, a way of letting people put their own subjectivity in front of them to study it. The stories that have come out of the investigation tell about both technical and adaptive elements in dealing with climate change and adaptation. This is a way of connecting with local realities in practice. The stories coming out from this approach show how climate change processes better can connect with local realities through building on what matters to people in their everyday life. The photos can tell something about what people find important in climate change, both on an abstract as well as on a practical level. People who are used to dealing with climate change and adaptation as a technical challenge applying technical solutions might be critical to the lack of focus on politics, money and resources in the approach. What is important to note here is that these factors are not neglected or forgotten. The purpose of this approach is also to find the subjective aspects around such solutions and potential conflicts that might help deal with them in an even better way. In practice this can be done by exploring people’s everyday
challenges and the local context in which they experience climate change. The methods of the research process: action research, the focus in the questions and the stories themselves are part of explaining how a new approach to climate change adaptation better can connect with local realities and engage action in an adaptation process. The next chapter will identify further what factors can foster agency and engagement with climate change adaptation in local communities.
Chapter 6 Fostering agency and engagement

Worldviews and awareness

When arguing that connecting to worldviews and values are necessary to meet local and global climate change issues, and arguing that current approaches to climate change adaptation does not do that, a new approach is needed. The previous chapter explored how the CBC approach can connect with local realities in practice through their focus on what is important to people in their daily life with their personal history of experiences. There seems to be a connection between connecting with people’s local realities and engaging action. One of the reasons the idea of climate change, and maybe especially human-made climate change, is so controversial is because of the complexity in variables, scales, types of data and perspectives in the debates. Many people don’t acknowledge climate change for different reasons, and even people who do acknowledge it have different reasons for doing so, as well as different ideas about solutions and responses when dealing with it. To understand the multidimensionality of climate change it is necessary to include subjective and intersubjective realities, not just so-called objective scientific truths (Esbjörn-Hargens 2010). The previous chapter argued that to connect better with local realities and engage action in climate change adaptation it is necessary to see it as an adaptive challenge and focus on values, worldviews, awareness, local context and frames of references. Drawing upon critical realism this chapter will explore and analyze how to promote necessary human action responding to climate change issues, and address the second research sub-question: “What factors foster agency and engagement with climate change adaptation in local communities?”

Critical realism describes a world where the reality exists independently of human beings, but at the same time it recognizes that the reality does not make sense to people without their experiences and concepts of the world (Bhaskar 2010, Danermark 2002). The many unintended ways that people affect natural systems have unexpected results, and it is hard to understand the connection between human action and the changing climate (Hukkinen 2008). Meeting these challenges it is useful to recognize the many complex and often hidden causal relationships between human action and climate change, and focus on understanding how people relate to climate change and adaptation on a personal level. When scientific data constructed within a certain worldview meets local realities with completely different understanding of how the world works, unsustainable adaptation will often happen. Attention to how people experience the environment and what they believe climate change is, combined
with reflection on the role of human action, could make adaptation processes more beneficial for the different interests in social-ecological interaction. Connecting better with local realities involves realizing that people see the world differently, at the same time as they co-create and affect the world with their actions. How people perceive and act in the world is affected by their worldview. The worldview can in different ways create resistance to change, as well as actions promoting change (O’Brien & Hochachka 2010). It is for many people easier to deny a problem instead of dealing with it when it is too complex (Kegan & Leahy 2009). Taking peoples worldviews seriously is important as a means of finding solutions that work in local contexts. Some connection points observed in the studies in Arcatao and Los Pozos could be presented as faith, *Memoria*, and sense of place and belonging. The Salvadoran tradition of liberation theology promotes action and solidarity rather than passive obedience in religion, and is a foundation for promoting action in relation to existing injustice and challenges (Nordstokke 2010. These factors could be seen as part of what fosters agency and engagement with climate change when people get the opportunity to relate climate change to their own daily life and experiences. When finding out what fosters engagement it is also important to consider what creates resistance.

Questioned about what climate change is to them personally, people in Arcatao and Los Pozos answered with photos of nature. Many, maybe most of, the photos came out with motives of nature, there were especially in the beginning almost no people in the pictures. This could be because people thought it was photos of nature that were expected. The way climate change is presented in current discourse and policies, it is something that has to do with nature. These photos can say something about how people feel they stand on the outside of nature and climatic events, more like observers and victims instead of as part of the process and challenges. By taking humans out of the climate change pictures, people do not see their own role in climate change processes. In the way CBC approaches adaptation, learning and developing in the process are important focuses. The action dialogues, workshops, and PhotoVoice are methods of making the participants in the project reflect on their own relationship with climate change and their own role in adapting to it. This gives a broader understanding of the problem and lays a foundation for a wider range of solutions, instead of just identifying who are vulnerable and applying a seemingly appropriate solution. In Arcatao and Los Pozos people live in close contact with their immediate surroundings and are dependent on good weather for good crops, the basis of their livelihoods. The conversations with and between the participants show how people have knowledge of what is sustainable in
their local community, but that it is not always easy to act in coherence with good ideas and intentions. When a farmer is dependent on using burning techniques or pesticides to get the best crop possible, he will probably do this out of mere necessity even being aware that this is not good for the environment.

The local farmers in Arcatao and Los Pozos are examples of people in communities who are very vulnerable to climate change. The severity of the situation for small farmers in El Salvador is visible in climate change models that predict a level of zero food production there within the next century (Ordaz et al 2010). Adapting to that scenario could prove difficult. This shows that adaptation measures based on technical solutions are important because there already are certain changes we have to adapt to. It is still important that the ideas and actions do not stop there and make people passive waiting for money or technology. Adaptation is often seen as a means of reducing vulnerability. This vulnerability of small rural farmers also affects their actions when they have to adapt to the consequences of climate change. This way both vulnerability and adaptation can lead to unsustainable practices, and adaptation can become another part of the unsustainable circle of dealing with climate change without really dealing with the source of the problem.

Local context and sense of place

An important part of people’s worldviews in Arcatao and Los Pozos seems to be where they belong. Identification with the place that is their home is visible in many of the stories from the war. The story from Los Pozos about how they returned to their homes before they knew it was safe, and how they endured the hardship of living there during large parts of the armed conflict was argued for in a very short sentence; “We had to go home”. It is also visible in the stories of how people are living and struggling with climate change today. In a conversation about how things are developing in the local community today a man stated; “I like living here, life in the city is good for those who live there because they are used to it, but for us it is better to live here”. In most models predicting climate change outcomes, as well as in models on how people rationally would act to obtain benefits, the human dimension of connection to family, home, values and what some might call irrational emotions are not calculated. Human action based on identity, awareness and feelings of responsibility for their community need to be counted in. At the same time many leave El Salvador for the north, dreaming of another life in the USA, which is draining the local communities for human resources. The reason for this is not explored in this thesis, but the numbers of how important remittances from
Salvadorans living abroad are for the country’s economy shows one contributing factor. Many of those leaving for the north, does so, to be able to send money home to remaining relatives and local communities. Seeing adaptation to climate change as a technical challenge might focus on the vulnerability aspect of why people stay or leave in a certain situation. This approach believes people live in areas vulnerable to climate change because they have no choice because of poverty, and that they would leave if they have the opportunity. Seeing adaptation as an adaptive challenge counting in the non-tangible aspects of family heritage and a connection to home is also important. Seeing climate change adaptation as an adaptive challenge and acknowledging that it is values and worldviews that is the key to promote change, it becomes important to focus on how to connect with people’s realities. This is necessary both to promote the best possible execution of technical solutions as well as going beyond the technical solutions and encounter the actions needed for real sustainability.

**Memoria – a link between the past, the present and the future**

In the case of CBCs adaptation work *Memoria* is a link that makes it possible to connect with people’s realities in Arcatao and Los Pozos. The leaders of these communities are people who experienced the war and still work a great deal with the consequences of the war. The position of CBC in the two local communities is based on them coming there working with *Memoria* and traumas from the war. The house CBC uses in Arcatao is called *Casa de Memoria* and is a meeting place for working with their themes and focuses. Being able to connect with people’s daily life demands finding links from one human being to another, one community to another and from one reality to another. Links can be emotions or relationships on different levels. It can be a concept, an understanding or an experience that people share. A link in Arcatao is death, everyone knows someone who have died in the war. Another link is surviving as part of the overriding concept *Memoria*. One of the reasons the technique of PhotoVoice might work so well in creating the links from the climate change focus to people’s preoccupation with the war is that the concept of taking pictures can be a part of conserving a memory.

Exploring what fosters agency and engagement means considering what creates resistance to sustainable climate change adaptation and try to move beyond it. When connection with local realities is part of the solution, finding ways of how to connect, as well as finding ways of raising awareness about the world when connecting, is crucial. The theory chapter discussed that even with good intentions it is difficult for people to deal with problems of climate
change, and behaviour and attitudes or values can be incoherent when dealing with such complex problems. The studies in Arcatao and Los Pozos show that vulnerability and a local context can affect how people act within their immediate surroundings which affect the environment. This makes it important to consider both cognitive and practical aspects when dealing with and adapting to climate change. Answering how it is possible to engage people as subjects in an adaptation process, exploring awareness raising through action research and adaptive leadership might prove helpful. Both these approaches could lead to start a conscientization process.

Conscientization – enhancing capacity to act

A new approach to climate change adaptation must include raising awareness at all levels in society to foster agency and engagement. Bringing in awareness raising through Freire’s concept of conscientization is useful when wishing to connect better with local realities and engage action in adaptation processes. This can also challenge existing ideas about possible solutions to the climate change crisis. This chapter argues that simply having knowledge about the climate change issue is not enough, feeling responsible and develop a deep understanding is important to be able to act. Overlying structures have also their part in this process of interaction, and it is a challenge to find out where to start when wishing to change individual behaviours as well as structures and systems. By asking questions about what matters to people culturally and subjectively it is possible to come closer to the solutions needed to face climate changes and help people make necessary changes in their lives. First to be explored in regards to raising awareness is the importance of acknowledging local knowledge and experiences.

Hukkinen (2008) states that combining different disciplines in climate change research is challenging because each discipline will have commitments and goals that might undermine the intentions of the other disciplines when trying to understand a phenomenon. It is then extremely important to acknowledge people as experts of their own everyday life where they continuously make sense of the world around them (Hukkinen 2008). It is important to remember that a social system is compounded of a population of reflexive, intentional organisms. Human beings tendency to construct rules for interaction with each other, and the environmental resources, is a key factor for change, and crossing the science-society divide has important implications (Hukkinen 2008). Knowledge about climate change and adaptation approaches is often based on expert knowledge without enough consideration of local context.
and lay knowledge. This expert versus the layperson dichotomy could dissolve if lay knowledge was seen as socially relevant and recognized as expert knowledge (Hukkinen 2008). The CBC investigates climate change through action research, with the goal that people in the investigation will participate and contribute in reflecting on their own impacts of nature as well as nature`s impact on them. Reasons to recognize the knowledge of laypersons is they are often the most committed to their livelihood and perhaps have the broadest knowledge about managing it sustainably (Hukkinen 2008), even though there are different ideas and interests in what is sustainable. Critical realism also enlightens this challenge when saying that scientific knowledge needs to be “approved” by people outside academia through for example a common understanding of language and concepts (Danermark 2002). A way to find a meeting point between everyday knowledge and scientific knowledge is through action research, the research approach of CBC. Action researchers can help further the conversations between people with different perspectives on reality, from economic to social to ecological perspectives as well as between academia, expert knowledge and the valuable knowledge normal people have in their everyday life situation when it comes to adaptation. Action research can be of significant value in building capacity for sustainable development. (Bradbury 2006). People participating in the climate change investigation of CBC expressed feelings of having their everyday life taken seriously and how this helped in connecting to questions of climate change in a new way.

In a context of climate change adaptation the combination of this subjective knowledge and the awareness created in a participatory action research process could be very important to find solutions to adaptation challenges where human agency must be considered. There are different views on what must change to meet climate change adaptation challenges. Action science and action research offer both theory and technique to loosen the bonds of beliefs and entrenched thought patterns enough to embrace new ways of learning, acting and inquiring (Reason & Bradbury 2006). In Arcatao and Los Pozos it was PhotoVoice and action dialogues that helped explore the theme of climate change adaptation. The complexity and breadth of action research methods reflects the need for both diversity and specific answers in different climate change adaptation processes. Human beings are preoccupied with their own security, their own livelihood, and react when it is threatened. Perhaps action research`s most important contribution is to focus on how participation and awareness creation help people understand how their own role, behavior and worldview affect climate change adaptation.
processes. This could prove important when discussing how individuals can act and affect systems in a process of change.

**Individual local action affecting a larger system**

According to how Clegg (2006) presents critical realism, some current approaches to climate change adaptation could be in danger of reducing environmental responsibility to the individual and deny structural powers at the social or cultural level. Another problem arise when worldviews and policies conceive people as no more than socially and discursively formed beings consequently with no real agency as in poststructuralist thought (Clegg 2006). It is important to reflect on how individual action can play a role in adaptation as processes of change, to be able to find factors that can help in connecting with local realities and engage action. The individual acts within a larger system and struggles with invisible causal relationships in how the world works as pointed out using critical realist ontology to understand the world (Danermark 2002). In climate change adaptation this means that even though this thesis argues adaptation must come from local action, the responsibility for climate change lies elsewhere. People in a local community like Arcatao or Los Pozos can through being aware about own role in affecting the climate and environment foster agency and engagement to deal with local impacts of climate change. This way they can to a certain extent influence their own future, even though also larger structures of for example international climate or trade policies could put restrictions on local political and individual possibilities for action.

Carlsson (2003) argues that people will only be able to understand and change the social world through identifying the structures at work that generate events and discourses. This could be seen as a critical realist argument to connect with people’s realities to foster agency and engagement to deal with climate change. Showing how important connecting with what matters to people in Arcatao and Los Pozos in an adaptation process, lays a foundation for exploring how people in other local contexts and other societies need the same to deal with even more abstract problems of climate change; like how to reduce overconsumption of energy and other goods. This will be further debated in the next chapter. The perspective of critical realism can thus be a help to acknowledge and promote the idea that individuals can change structures even though structures to a certain extent are decisive of how individuals feel, act and behave. At the same time it is important to be able to separate what factors are responsible for climate change and what adaptation work is about.
Taking the subjective elements of adaptation into consideration might help widen the range of solutions to many of today’s current and future challenges. Even though opportunities, resources and power are unequally distributed around the planet, this does not always affect directly the ability to adapt to changes or difficulties (Nelson 2009). It is thus important to look for answers to why and how people do or do not adapt on different levels of different societies. Since climate change is a global phenomenon with local outcomes, the global results and answers depend on solutions and actions from local communities and individuals.

**Adaptation: who will lead?**

The CBC approach climate change adaptation by asking people what climate change is to them, and how they feel about it as well as deal with it. By taking into account people in Arcatao and Los Pozos’ experiences and emotions they make connections between the strengths people used to survive the war and how people can use these strengths to meet today’s challenges with climate change. This approach creates a space where adaptation to climate change can be about finding compromises and solutions instead of approaches that mainly enforces conflicts of interests. Climate change creates a need for people to use problem-solving abilities and creativity, and transformation can be a chance to renew organizations, and to promote growth through greater creativity and innovation. In a transformation process the type of change and the degree of change are two important dimensions (Isaksen & Tidd 2006). A challenge is that people often are stuck in a mindset where they can see potential solutions only within the framework that created the existing problems. With this, people end up never seeing an entirely different solution to existing problems. The current challenge in climate change adaptation seems to be to develop ways of managing under highly uncertain rapidly evolving and changing conditions (Isaksen & Tidd 2006). A new approach to climate change adaptation, like the one of CBC, could enable people to better see the whole picture and go beyond adaptation as response and resilience.

Climate change adaptation processes require significant changes in mindsets. This demands changes in individual’s underlying meanings that give rise to their behavior, and the first who need to change are maybe those with the power to change others; the leaders (Fullan 2004). Different types of leadership and influence have different kinds of impact on creativity, innovation and transformation processes, and there are different ways of looking at leadership. A multidimensional approach to leadership focus on a complex set of considerations, like in situational approaches where different contexts require different types
of leadership (Isaksen & Tidd 2006). The orientation of followers can also influence how they prefer a leader to act. Followers with intrinsic values like responsibility and initiative prefer to work under a charismatic leader, while people with a more instrumental approach do not (Isaksen & Tidd 2006). This also shows how worldviews and values matter when dealing with climate change. Eventual changes in worldviews and values must come when individuals become aware, feel responsible and are ready to change from within. Manipulating or forcing people to change, on the other hand, is not constructive. Transformational leadership is not based on physical rewards but on motivation. Creative leadership is about understanding people, desired outcomes, methods and context. It is also about creating an environment for supporting creative talent and facilitating learning, effectiveness and innovation in a group. There are three basic dimensions in creative leadership; which are focus on tasks, on people and on change (Isaksen & Tidd 2006). A type of leadership that includes the focuses of transformational and creative leadership, combined with a focus on the whole picture of people’s relationship with nature is adaptive leadership (Heifetz 2010). Adaptive leadership as part of seeing climate change as an adaptive challenge, is important when exploring ideas of how individuals can change systems even though systems affect how individuals behave and feel.

Heifetz (2010) emphasizes that leadership is not equal to authority, but rather what emerges when someone challenge authority and bring people, organizations and systems further without pushing them completely over the edge. Isaksen & Tidd (2006) calls leadership wise use of power. Combining the thought of how the double bind and fear creates resistance in people to taking climate change seriously on the individual level, and the thought that change on the individual level is necessary to adapt and to act constructively in adaptation processes in a specific local situation, as well as in global environmental politics, could point towards change in leaders as especially important for creating sustainable social-ecological systems. The approach of CBC focuses on the subjective sides of adaptation like emotions and values. This is a different focus from promoting short term economic benefits, and it is challenging current approaches that define today’s climate change adaptation plans and policies. This can be seen as an example of adaptive leadership because through raising awareness in their work methods, the people participating get an opportunity to challenge own values and worldviews. Many of the leaders in the local community of Arcatao and Los Pozos are people who in different ways were central in the conflict and post conflict in the region, as are many of those participating in the Salsita investigation. Large part of their identity is built on faith and
surviving the war. Adaptive leadership is about helping people through loss, something these leaders have experience with. This specific type of leadership is necessary to bringing this approach to change to the rest of the local community. On another level, it is people in the CBC who execute adaptive leadership in the way they approach climate change adaptation and try to connect with the daily life of people in Arcatao and Los Pozos, taking their experiences and context into account. Technical solutions to technical problems will often have adaptive elements in them, and is not completely separated from adaptive challenges (Heifetz 2010). Analyzing what are technical and what are adaptive challenges is the first step in adaptive leadership, and is one of the focuses of the adaptation work of CBC through their action research approach. Recognizing these subjective elements needed in adaptation policies and plans could also make it easier to get sustainable long term solutions when applying the technical and practical parts of the solution.

Adaptive challenges can be uncomfortable to deal with, and the mental challenge lies with all people as actors in a society whether they are leaders, researchers or local farmers. Theory of adaptive leadership helps understand the relationships between leaders, adaptation, systems and change in a practical way (Heifetz 2010). Adaptive leadership is the practice of mobilizing people to tackle tough challenges and thrive, as is needed in adaptation processes. New environments and new ways of living require new strategies and abilities. Leadership in a changing environment must focus on questions of values, purpose and process (Heifetz 2010). In a climate change adaptation process where values, priorities and practical interests may clash, leaders with this focus might help solve many conflicts. What makes the approach of CBC connect better with local realities is; they take an adaptive leadership approach through action research, and this can create awareness and conscientization. Focusing on awareness at the individual level is not to put the whole responsibility on the individual. It is to give the individual a chance to reflect on its own role in a system and make a person able to change it when desired or necessary. When leadership manages to create constructive change in people, in communities and in societies there is hope of sustainability in social-ecological systems. Changing the way we think involves some basic elements; it is cognitive and occurs internally, it is a process that involves knowledge, and it is directed towards a solution to a problem (Isaksen & Tidd 2006). To go into cultural change, the very soul of organizations and its people, values and beliefs have to be considered. When leadership is not synonymous with authority, anyone can and must sometimes function as a leader in a certain context at a certain time, and anyone can learn to lead (Heifetz 2010). Leaders search for opportunities to
change the status quo, and passionately believe they can make a difference. This involves experimenting and risk-taking where mistakes and failure ideally should be seen as learning opportunities (Heifetz 2010). Leadership is to have visions for the future and affect others to work for the same goal; with good communication they can take initiative to turn visions into reality (Isaksen & Tidd 2006). It could be argued that having visions for the future is part of what fosters agency and engagement. In Arcatao and Los Pozos the photos and stories where people related climate change to their daily experiences, the photos portrayed friends and family. Especially children were portrayed as being those most vulnerable to climate change as people assumed it would get worse in the future. The thoughts and feelings around what had to be done today, was argued for by explaining how they had to take care of future generations.

**Focusing on opportunities**

Adaptive leadership is to make difficult choices and priorities in beliefs and actions, and make yesterdays adaptive pressures, problems and opportunities generate responses so that they become today’s technical problems and routines (Heifetz 2010). The foundation for connecting with people’s local realities is seeing climate change as an adaptive challenge. Isaksen & Tidd (2006) point out that intellectual stimulation from leaders have a stronger effect on organizational performance under conditions of perceived uncertainty. This includes effect on behaviors that increase other people’s awareness and interest in problems and help them develop ability to tackle problems in new ways. Tackling the concrete problems and existing challenges emerging from climate change must be a part of creating long term sustainability in social-ecological systems. Adaptive leadership focuses on how to increase people’s capacity to act in a system that tells them not to (Heifetz 2010). To be able to change an organization like a local community and the world it is necessary to lead people through a sense of loss in a changing and insecure situation to come out with a positive long lasting result (Heifetz 2010). In a situation of uncertainty like climate change, the discourse of catastrophe, the missing cognitive capacity of dealing with complex issues, or the victimizing of a part in the conflict can paralyze people and hinder actions to affect own future and daily life. In Arcatao and Los Pozos people participating in the project focused on their strengths and what possibilities they already have in the local communities. They have survived enormous stress and shock before, and they have the possibility of bringing the strengths of surviving the war into surviving with the changing climate.
This chapter has looked at what fosters agency and engagement with climate change. The many complex connection points that have been mentioned, like people having faith in God and in the future, as well as the experiences surviving the war but losing friends and family tied to the concept of Memoria, and the belonging they feel to the homeland they live in are part of peoples motivation to work and change when the connection between dealing with different challenges are made visible. This is all part of seeing climate change adaptation as an adaptive challenge. Connecting with these aspects of people’s lives could also start a process of conscientization. Action research and adaptive leadership has in this chapter been pointed out as catalyst to foster agency and engagement through creating awareness and promote change from within. The reflections in the two previous chapters have presented and discussed how it is possible to connect with people’s local realities and what fosters agency and engagement with climate change. The next chapter will explore further why it is so important to connect to people’s everyday experiences, and how the experiences from Arcatao and Los Pozos can be useful for other people in other local contexts dealing with climate change.
Chapter 7 Scaling up: a new approach in different contexts

The climate justice reason to act

The previous chapter brought adaptive leadership into the debate as a factor that can foster agency and engagement in climate change. Leadership is an example of how individuals can have impacts on systems, and adaptive leadership raising individual and collective awareness was argued to be important to engage action to promote change. The two previous chapters have explored how people relate to climate change in practice in a specific local context. This chapter seeks to explore how this can be relevant in other parts of the world with different local contexts. This chapter will address the last research sub-question: How are the experiences from investigating climate change adaptation in a specific local context relevant for dealing with climate change in other local communities as well as on a global level?

As argued through the thesis a part of why it is important to connect to people’s local realities is that people see and experience the world differently, which again affects how they act in the world. Adaptation is something that must happen because the environment already is changing, and what is important is to also bringing in the subjective and human aspects of climate change adaptation. In addition to creating long term sustainability, the justice aspect around adapting to climate change is important when discussing adaptation to climate change.

In Latin America many people have a strong feeling of injustice based on oppression of indigenous cultures and small farmers from the first steps of colonialism and later post-colonialism and imperialism (Morales 2010). Many people feel they live with the negative consequences of changes in the climate, as well as on the downside of the socio-economical imbalance in the world, which people of the west have caused by their consumerism lifestyles. This is an uncomfortable aspect of climate change adaptation that makes it more important to find solutions also in countries where climate change not yet have as visible effects and consequences as in El Salvador. Based on the experiences from Arcatao and Los Pozos it is possible to argue that a way for people to become aware of climate change issues is through seeing the direct effects of human action on their immediate surroundings in local environmental problems like lack of water, local pollution and disappearing trees. This is possibly more difficult on a global level and in places where people in communities do not see, or are not directly affected by, their own actions that affect nature and surroundings. The answers to the question “what is climate change to me?” show how people in Arcatao and Los Pozos talk about local visible effects of different environmental problems, and not what
climate change researches would define as climate change or what is depicted in climate change models. What climate change is to people personally is apparently different from what is presented as climate change research in for example IPCC reports. This has been argued through the thesis to be important when applying measures of adaptation in local communities, because it says something about what people are mentally and practically able to deal with. If the same mechanisms work for people in other local contexts; the subjective understanding of what climate change is, and how human action have impact on it, also matters when desiring to change behaviors of consumption and implement policies of mitigation.

Arguing that what is missing in current approaches is the focus on values and worldviews, as well as a general lack of connecting with people’s realities, creates challenges. According to double-bind theory global climate change represent such a complex threat that people are unable to deal with it in a constructive manner due to insufficiency in cognitive capacity (Antal & Hukkinen 2010). International climate policies and solutions do not appeal to many people, and even when it does, many people do not behave consistently with their environmental friendly attitudes and values (Høyer 2010). In a rich local community where the distance between people’s actions and the results of those actions are large, people are so accustomed to the mass consumption life style they have no interest in, or reason for, changing anything. In a poor local community where people’s livelihoods depend directly on their immediate surroundings people are at times dependent on using unsustainable practices to survive. Even though the explanations for the incoherence between behavior and attitudes in different living situations, it is nothing that implies that people in poor local communities would live sustainably if only they had a chance to. Vulnerability is part of making the situation worse, but sustainability will probably not become a priority if only vulnerability is reduced. It is necessary to connect with how people feel about and see the world, and from there enable people to find strength to act. The climate justice aspect is a reason to act before it is overtly necessary in a certain local context, because lack of action in one location means adaptation or inability to adapt in another location.

**Overcoming cognitive resistance to change**

In the process of studying adaptation to climate change it could be important to discuss whether it matters to talk about global warming and climate change as human-induced; or whether it is the process of adaptation that matters without debating the causes of climate
change. It seems harder to accept and adapt to climate change when seeing it as an external threat, than as a phenomenon people are partly responsible for through overconsumption of energy and resources. Adding to the lack of cognitive capacity presented as the double bind, theory on cognitive dissonance claim reasons for denial and such hindering both adaptation and mitigation processes could be stronger when being forced to accept climate change as results of human action (Festinger 1957). Many people, who see themselves as having good values promoting environmentalism, also have worldviews tied to a consumerism lifestyle.

Recycling, biking to work, or growing tomatoes in the kitchen window does not necessarily make people think twice about flying to the other side of the world for a political or academic conference, or a holiday. Enjoying eco-tourism and local short-travelled food after a 24-hour flight could thus be seen as somewhat ironic (Høyer 2010). A basic need for human beings is experiencing coherence between actions and attitudes. The psychological concept of cognitive dissonance explains that when people act in a certain way, they need to justify their actions internally. Studies show that because of this cognitive need for inner justification behavior affect attitudes more than attitudes affect behavior (Festinger 1957). How to act in a difficult situation is affected by thoughts and attitudes that defend existing behavior. Vulnerability will sometimes promote necessary behavior that again can affect attitudes towards climate change and adaptation issues. In other circumstances behaving in an environmental friendly manner can demand breaking through existing patterns of behavior even when people’s values tell them they are promoting sustainability. Awareness about how people’s own behaviors, comfort zones, values and attitudes can hinder or promote the way people feel and act in response to climate change should ideally be invoked in their worldviews.

Seeing adaptation and mitigation as connected parts in finding solutions to climate change problems globally, makes it important to talk about climate change as human-made, but not as a threat impossible to meet. This is important to create an understanding of how people co-create nature and affect their surroundings. This is a way of moving beyond adaptation as coping and climate change adaptation based solely on technical solutions. Climate change adaptation is an area where people have to try something new, to find ways to tolerate losses and gain new capacities. A step on the way of approaching climate change adaptation as an adaptive challenge is to help people decide what kind of world they desire, as well as analyzing how the world works (Heifetz 2010). If people do not desire a world that continuously must adapt to insecurity and catastrophes resulting from climate change it is
necessary go to the source of the problem; the interaction in social-ecological systems between actors and interests fighting over resources that are becoming more and more vulnerable. The process of finding out what world people want is also challenging, especially since many people find such strong incoherence in how they really wish to live their lives and how they think they wish to live (Høyer 2010). The point is that cognitive resistance to change, and to climate change in particular, is visible also in other local contexts as well as at a global level. Such subjective stories as presented from Arcatao and Los Pozos can be a part of defining what kind of world people want.

Just imagining another world than the one people are accustomed to can be difficult, but may be absolutely necessary to enhance capacity to act and change (Damman 2011). An important thing to be aware of is that change happens over time. Particular ideas and organizations are situated in a certain time and are affected by specific values and expectations of that time. Change must happen in ideas, organizations, and values, but does not always move in the same direction or at the same pace. The idea that created the term sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” shows the belief that today’s generations are able to determine what it will take for future generations to be able meet their own needs. This relies on a very strong predictive assumption regarding both capacities and values of future generations (Miller 2006). Miller (2006) quotes John Dewey who writes in the book Democracy and Education from 1915: “The conception of education as a social process and function has no definite meaning until we define the kind of society we have in mind”. A part of adaptive challenges is precisely to think ahead and imagine what kind of world is desired, and what the necessary actions to get to that world are. Creating a conscientization process as a goal in an action research approach, can be used in other local communities where people need to develop an understanding of how people’s actions and attitudes affect the environment around them, now and in the future. As discussed in chapter 3 some would call such awareness creation processes “pedagogy of the privileged” instead of “pedagogy of the oppressed” (Reason & Bradbury 2006). The goal is either way conscientization; giving people an opportunity to make internal changes and take responsibility for themselves, as well as the world around them.
Promoting new types of leadership on the international level

International policies on climate change fail possibly because people only see climate change as a technical challenge with technical solutions. A lack of political leadership combined with a lack of electoral demand, as well as opposition from strong interests often frustrates attempts to create policy interventions (Crompton & Kasser 2009). This does then not deliver the extent of regulatory change needed to address systemic environmental challenges. When current policy responses fall short of the level of intervention needed it is necessary to promote irresistible electoral demand, sufficient policy regulatory intervention and create global leadership (Crompton & Kasser 2009). Focusing on specific behaviors avoids focus on lack of structural and political changes and puts the responsibility on the individual (Crompton & Kasser 2009), while focusing solely on structures take responsibility away from the individual. Adaptation to climate change seen as an adaptive challenge could be used actively to solve this problem instead of letting adaptation continue to be mere symptoms relief or a question of blame and finances. Action and leadership must come from a national, regional, local and an individual level, not just from failing international agreements. This does not, however, mean that climate change solutions depend on individual actions alone without a thought about the structures of societies and international policies. The point is that approaches to climate change adaptation must take into consideration every level, also the individual, and not promote paralyzing discourses presenting an unchangeable system leading to destruction. In an adaptation process, be it to local changes or in global politics, leadership is a crucial factor in managing people in a desired direction. Theory on adaptive leadership focuses on promoting actions of guiding people through difficulties in a way that could lead to a positive result (Heifetz 2010). Adaptive leadership could potentially affect whether an adaptation process to climate change will turn to successful transformation and positive outcomes for social and ecological systems.

Systems consist of individuals, and to change systems towards sustainability it is necessary with leaders at the systems level who become explicitly conscious of the fact that they should be engaged in widening people`s experiences and identifications. Changing systems means changing the entire context people live and work within. Fullan (2004) promotes the term system thinkers in action, and claims that creating system thinkers who work towards strategies that alter people`s mental awareness of the system as a whole will contribute to altering the system itself. Emphasizing the focus on climate change adaptation as an adaptive challenge, people need to change the way of thinking and the way of working, change
individual cognition and organizational routines to achieve transformation. New challenges answered with old responses do not lead anywhere (Isaksen & Tidd). The CBC investigation on climate change adaptation in Arcatao and Los Pozos has been promoted in this thesis as adaptive leadership on a local level through analyzing what are technical and what are adaptive elements of adaptation. This could also be useful to do in other local communities, as well as on a global level. Finding out what the subjective and hidden sides of why international or national climate policies are difficult to agree upon could lead to solving some of the issues. Seeing climate change internationally as an adaptive challenge, it is necessary to find out who benefits from the current situation and why. People benefitting from keeping the status quo can be people who could risk their short term well-being or economic privileges, people who would lose a sense of feeling secure, or people who do not desire to change their view on how the world works and their role in it. The losses in realizing the necessity of change can thus be physical and practical, but also emotional and cognitively challenging. The losses in a local community context where different livelihoods might compete for resources might differ from a global context where political prestige and power might be at stake. It is still important to remember that many of the same subjective aspects of the challenge of climate change, like values and worldviews, are underlying for several organizational levels. Assuming that climate change adaptation processes could contribute to shifting power balances in different systems could make executing necessary changes in an adaptation process extra challenging, depending on how people who benefit from the situation would want to keep the status quo. Adaptive leadership is thus useful both on an individual and local community level, and could prove important in creating and executing international climate policy agreements.

Summing up this chapter the experiences from investigating climate change in Arcatao and Los Pozos can be relevant for other local communities as well as for climate change policies on a global level because many of the same mechanisms work the same way also outside these local communities. A reason for why approaching climate change in a new way is relevant is the aspect of climate justice. This focus on adaptation in El Salvador could be one small contribution to helping people in local communities, and people on other organizational levels, in countries responsible for the main amount of emissions and pollution trough overconsumption of goods and energy in the world, deal with the challenges of climate change. It has been argued in the previous chapters that the political and emotional key to connect with people in Arcatao and Los Pozos are through Memoria. This will not be the case
in other local communities, but finding a connection point like this should be possible also in other organizations and communities. Finding such connection points or keys to understand what people care about could be more difficult on a global level, and that is why connecting on the local level where it is possible to explore people’s everyday lives and challenges is so important. It is possible that the larger the distance between human action and the visible results for other humans and own life is, the harder it is to understand and deal with the complex interaction between humans and environment in social-ecological systems.
Chapter 8 Conclusions

An integral approach

This thesis has through seven chapters addressed the research question: “How can climate change adaptation processes connect better with local realities and engage people as subjects of change, capable of influencing their own future?” The introduction started with presenting a scenario where earth is facing a four degree Celsius global warming, which will have significant consequences for all social-ecological systems. It was argued that climate change is a global phenomenon with outcomes that will differ in local contexts depending on the specific events, as well as what possibility people have for dealing with these. The difference will depend on amongst other things how the local communities are organized and prepared to meet and manage risk and change. El Salvador is a country often seen as poor, affected by war and trauma and especially vulnerable to climate change. This thesis has with the help of CBC’s climate change adaptation approach, shown the potential for human agency that lies in people in local communities, even when many work within a climate change discourse that argue that people are not capable of affecting their own future. The thesis has argued that the way current approaches to climate change adaptation, which mainly focus on technical challenges and costs of adaptation, are insufficient. Through mainly focusing on technical elements in an adaptation process, and forgetting the adaptive elements, current approaches to climate change adaptation do not connect with local communities. Such approaches are not sustainable because the technical solutions that are used could be wrong for the local community; it might also often be a completely different solution that is needed. Approaches that apply responses to reduce vulnerability, using concepts of sustainability that promote growth without limits, need to include a wider range of perspectives. It is necessary to redefine what sustainability is and acknowledge that adaption can be more than a mere response to afflicted problems. A focus throughout the thesis has been that the human and subjective sides of adaptation like emotions, values, worldviews and sense of belonging are forgotten in current approaches to climate change. These elements need to be included in a new approach to climate change adaptation, both because of a climate justice aspect and to secure long term sustainability socially and ecologically as well as economically.

Through the thesis it has been discussed how the challenge of adapting to climate change is affected by the fact that the relationship between overlying systems and human behavior is a complex relationship of mutual affect. Consequences of climate change create vulnerability
which requires people to adapt to certain changes. These adaptation processes as a response to the created vulnerability can become factors causing more unsustainable human practices leading to even more severe environmental degradation. Other challenges in adapting to climate change are the lack of cognitive capacity to understand the complex and often hidden relationship between human actions and climate change, and the difficulties of behaving consistently with values promoting necessary environmental practices. Data material analyzed in this thesis has shown how people feel they stand on the outside of nature and climatic events, more like observers or victims, instead of being part of the challenge. By taking humans out of the climate change picture, people do not see their own role in climate change processes. This shows how resistance to change is a complex challenge needed to be overcome to promote climate change adaptation that can secure long term sustainability for different interests in social-ecological systems. Seeing that local adaptation processes can be part of affecting the environment, it is necessary to see adaptation as a possibility for social and political action instead of just a response to changes inflicted on a local community. Local communities like Arcatao and Los Pozos in El Salvador are places where people’s livelihoods in agriculture depend on weather and climate to survive. They are also communities vulnerable to effects of climate change and stand in the position of needing to adapt to the occurring consequences of instable weather in form of amongst other things droughts and floods. This thesis argues that connecting with local realities is important to engage action in adaptation processes that can lead to sustainable practices. In Chapters 4 and 5, a way of connecting with local realities in an adaptation process in practice was discussed, with an emphasis on how the NGO Centro Bartolome de las Casas (CBC) approaches it in their climate change study, Salsita, using action research methods and PhotoVoice. This thesis argues that the CBC approaches climate change adaptation as an adaptive challenge through their work and focus on the subjective sides of adaptation.

An important point when distinguishing the technical elements from the adaptive elements of a challenge is that both aspects are essential to finding solutions to the challenge. Arguing that it is necessary to see climate change as an adaptive challenge does not mean forgetting about the known and existing solutions to climate change vulnerability. Focusing on infrastructure, technology, existing ways of organizing and preparing for consequences of environmental degradation is immensely important. Bringing in the adaptive elements and seeing climate change as an adaptive challenge means to also consider the subjective sides of adaptation like cognitive capacity, worldviews, emotions and values when implementing the known
solutions. A focus on a bigger picture, considering a wider range of perspectives on adaptation than is done in current approaches, could contribute to existing practices being made more sustainable across scale and for different interconnected parts of a social-ecological system, as well as to find new ways of handling adaptation. In the stories resulting from the action research approach of CBC it was possible to identify that a connection point with people’s local reality in Arcatao and Los Pozos was Memoria. Memoria could be described as both a political and an emotional key for connecting with the way people see the world through connecting with the history of challenges people there have experienced. The focus on how people can learn from difficulties in the past and use this strength and experience to meet daily challenges, as well as build the local community today, could prove important in an adaptation process. Using the connection point Memoria can contribute to people learning directly from what has happened in the local communities before, but can also be used to find links between different issues in people’s lives beyond the concrete tangible knowledge from surviving a war. What is important to learn from identifying such connection points is that it is the finding and exploring of these links between what is important to people, and how this affect how they act in the world, that can be used in a wider context. In other local communities and on other organizational levels climate change is just as complex and incomprehensible as in this specific local context. The connection points will be others in other contexts. Finding the links that can help people understand their own role in affecting the environment can be crucial to implement sustainable adaptation and enable action and agency in a challenging situation.

Regarding what fosters agency and engagement with climate change adaptation in local communities, this thesis found that overcoming resistance to change and creating awareness and feelings of responsibility through conscientization were important parts of the answer. As shown it is the concept of Memoria, the feelings of belonging and faith in God and the future that were aspects it was possible to connect to. Connecting to what was important to people in Arcatao and Los Pozos through action research and the PhotoVoice methodology intended to start processes of conscientization. People participating in the climate change investigation of CBC expressed feelings of having their everyday life taken seriously and expressed how this helped in connecting to questions of climate change in a new way. The discussions of human agency and leadership in climate change adaptation processes have focused on overcoming the difficulty of cognitive and organizational resistance to change. Seeing climate change adaptation as an adaptive challenge from a social-ecological systems perspective shows there
are many factors that contribute to human action. Many of the stories told in Arcatao and Los Pozos show how people easier can relate to the concrete environmental degradation affecting their local livelihoods than to an abstract concept of global climate change. Critical realism has through the thesis been used to explain how human action and climate change interact in such complex relationships that this in itself makes it hard for people to act and adapt to climate change. The difference between what is actually happening in the world and how people experience it makes it important to acknowledge people`s everyday knowledge when creating science and policies on how adaptation should be implemented. Seeing climate change issues in the light of critical realism, it is possible to say that climate change is happening even though people do not have complete knowledge about all the mechanisms affecting it. What is important is exploring how people experience, talk about, and deal with climate change and adaptation in practice. This way people can come closer to understanding what is happening, and develop an approach to adaptation that consider the many factors affecting climate change, including human agency.

As mentioned above it has been argued in the thesis that conscientization based on Freire’s (1999) theory pedagogy for the oppressed can be part of the answer to help people become subjects of change, capable of influencing their own future (Pelling & Manuel-Navarrete 2011). The intended start of a conscientization process in the climate change investigation in Arcatao and Los Pozos created connections between past challenges and new challenges in the local communities. A new approach to climate change adaptation including action research promoting conscientization is about bringing in everyday knowledge to understand climate change issues. What is also needed in this new approach is leadership that can start such initiatives. It has been argued in the thesis that the CBC as an organization takes an adaptive leadership approach. By including the adaptive elements of significance from local context, history, emotions and worldviews in studying adaptation, CBC perform adaptive leadership. By helping people in Arcatao and Los Pozos explore what they value, what they have learned from the past and what resources they have to build on in the local community, CBC enhances people`s capability to affect their own future. At the same time many of the participants, the co-researchers, are adaptive leaders in their local communities. They are people of faith, people who believe in the future and people who work every day in and for their local community considering a range of aspects to their daily challenges. CBC starting a conscientization process could lead to more people becoming aware of, and feeling responsible for, the relationship between human action and environmental degradation. The
connection with local realities through action research from an adaptive leadership perspective can create engagement and awareness that again can result in sustainable and just adaptation.

Discussing the different approaches to how human agency play a role in climate change adaptation, from focusing on the cognitive individual aspects, the collective collaboration between experts and laypersons in local communities, and the focus on adaptive leadership show the need for new types of knowledge about adaptation processes and human action in relation to climate change. This focus in this thesis could be a small contribution to highlighting the importance of including a wider range of perspectives and approaches when studying and creating adaptation policies. Wilber (2000), Hochachka (2006), Esbjörn-Hargens (2010) and O’Brien & Hochachka (2010) call such an approach an integral approach. The integral approach focuses on that it is the combination of the different dimensions, and seeing the whole picture that will lead to useful responses (Esbjörn-Hargens 2010). This approach creates a space where adaptation to climate change can be about finding compromises and solutions. This could be more constructive than using approaches that do not move away from focusing mainly on conflict of interests and technical problems. The focus of international climate change conferences and policies on climate change and adaptation, have for a long time been on the financing of adaptation and mitigation (Climate Fund Info 2012). The next big international event on environment and sustainable development is Rio+20. The United Nations Conference Rio+20 start on June 20th 2012, and marks it is 20 years since the 1992 Earth Summit in Rio. The objective of the conference is to secure renewed political commitment for sustainable development, assess the progress to date and the remaining gaps in the implementation of the outcomes of the major summits on sustainable development, as well as addressing new and emerging challenges. The conference will focus on two themes: a green economy in the context of sustainable development and poverty eradication; and the institutional framework for sustainable development (Rio+20 2012). Since the Brundtland Commission’s Report in 1987, sustainable development has been an idea in environmental politics promoting goals of sustainability within the economic framework already existing in the world; some also call it the framework of neo-liberalism (Sneddon 2004).

If people, political leaders, and civil society at Rio+20 are to encounter solutions to challenges of sustainability, climate change and adaptation, the elements and factors to promote human agency and engagements pointed out in this thesis could be worth considering. Instead of
letting the concept “green economy” take over for the established “sustainable development” used for over 20 years, it could be useful to look at the other aspects of climate change adaptation and sustainability through a more integral approach. A mere change of terms might just uphold the current ways of handling climate change and adaptation, without seeing the need for changing mindsets, practices and larger systems. A new approach to climate change adaptation must be about finding a balance between these three dimensions, and not putting the whole responsibility on the individual. Claiming that individual action is necessary and important does not mean we should forget overlying systems and structures affecting individual behavior. Several ways of trying to engage people with climate change and adaptation promotes ideas of climate justice, and the idea that people’s worldviews will change if people just have enough information. These aspects could also contribute to making people passive instead of active. Action research can be a way to empower people, and participation seems to be a key in a conscientization process. The complexity and breadth of action research methods reflects the need for both diversity and specific answers in different climate change adaptation processes. Perhaps action research’s most important contribution is to focus on how participation and awareness creation help people understand how their own role, behavior and worldview affect the environment. The positive and solution based focus from critical realism, action research, theory of adaptive leadership, “pedagogy of the oppressed” combined with cognitive capacity research can give individuals, local communities and movements possibilities to act and adapt to the climate change challenges in a just and sustainable manner. What is needed in climate change and adaptation research today is thinking outside today’s existing frameworks, helping people cope with eventual loss, and promote change from within, still remembering structures of power and influence, imagining what people could gain from acting consciously in the changing world. What is needed is a new approach, an integral approach; an approach that has started in two local communities in El Salvador led by the people in the NGO Centro Bartolome de las Casas.
If an egg is broken from outside life ends, if an egg breaks from inside, life begins.

Great things always start from inside.

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