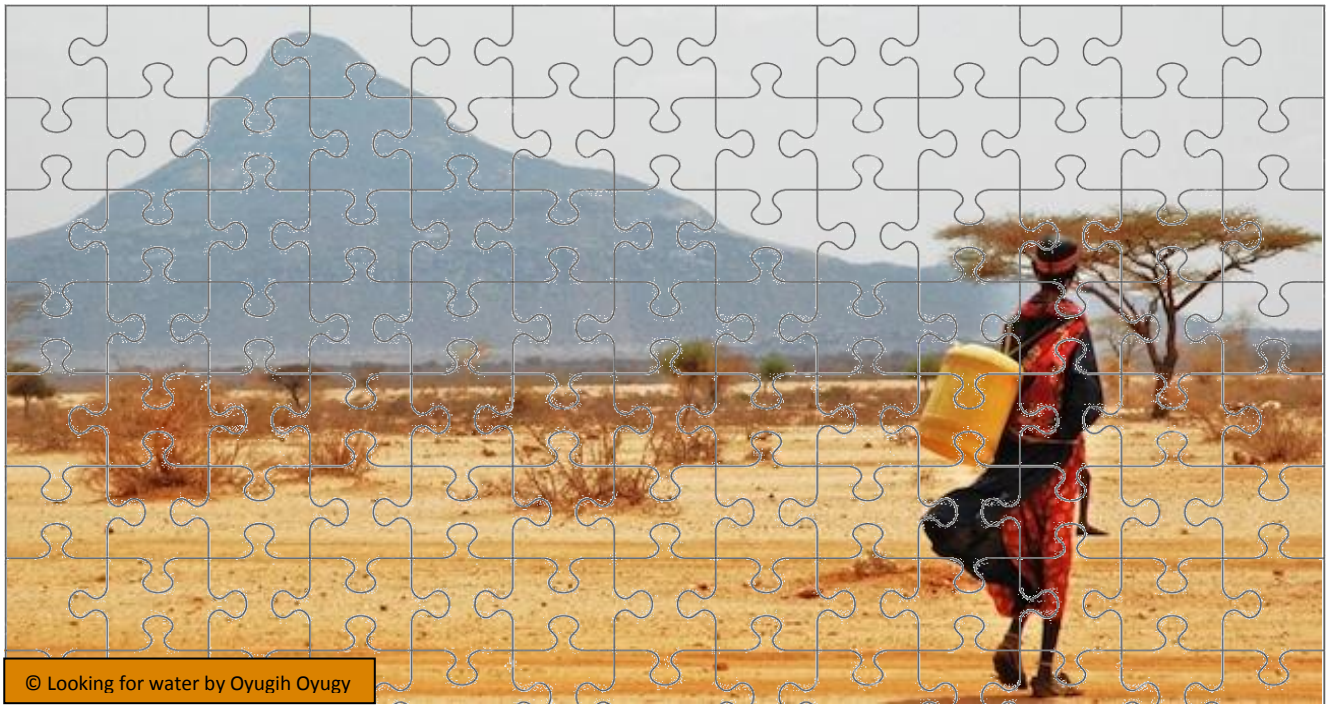
Forest and Nature Conservation Policy Group [FNP]

How Community Practitioners Adapt to Climate Change

Integrating climate information in adaptation practices:

Case studies from Kenya



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Abstract

Climate change impacts in Kenya are getting worse every year. Each year the frequency and intensity of climatic events has increased and gotten worse. More events such as droughts and floods has resulted in loss of livelihood and sources of income for many community groups in Kenya. To cope with these extreme events, communities are adapting their livelihoods to the impacts of climate change. Climate change adaptation therefore supports communities to adapt to impacts of climate change by understanding the past climatic condition and how these conditions may change in future. Often this involves applying climate information through climate scenarios, early warning systems, indigenous and local climate knowledge or historical climatic data. To integrate climate information into adaptation practices requires understanding of climate information, understanding the social context in which adaptation practices occur and how climate information is performed in adaptation practices. This study therefore incorporates practice theory to further understand the elements that constitute adaptation practices in Kenya and the social context in which adaptation practices are situated. Practice theory was also applied to get an understanding of how climate information is performed in adaptation practices in Kenya. This was done by studying three local NGOs in Kenya through a case study approach that incorporated participatory observation, in-depth interviews, and literature reviews. To support these findings, twelve local organizations were selected using purposive and snow-ball techniques, and in-depth interviews were conducted. The concepts material, meaning, competence, performance and situated agency were applied in this study. The results reveal that climate change adaptation practices are situated in practice. Further, findings also suggested that climate information is performed in adaptation practices within given social settings. This study therefore argues that integration of climate information in adaptation practices should be situated in practice.

Key words: climate change adaptation, climate information, practice theory, performance, situated agency, Kenya

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List of Acronyms

ACTS	African Centre for Technology Studies
ACC	Africa Conservation Centre
ALIN	Arid Lands Information Network
ASAL	Arid and Semi-Arid Land
BEACON	Building Eastern Africa Community Network
CAFOD	Catholic Agency For Overseas Development
CCFAS	Climate Change Agriculture and Food Security
CEO	Chief Executive Officer
CSO	Civil Society Organization
CoP	Conference of Parties
CRM	Changiani Rasili Mali
ELCI	Environment Liaison Centre International
ENSO	'El Niño–Southern Oscillation
GCM	Global Circulation Model
GDP	Gross Domestic Product
GoK	Government of Kenya
HBF	Heinrich Böll Foundation
ICPAC	IGAD Climate Prediction and Application Centre
ICT	Information Communication & Technology
IEWM	Institute of Environment Water and Management
IPCC	Intergovernmental Panel on Climate Change
IRI	International Research Institute
KARI	Kenya Agriculture Research Institute
KCCWG	Kenya Climate Change Working Group
KMD	Kenya Meteorological Department
LINKS	Livestock Information Network and Knowledge System
MET	Meteorological department of Kenya
NCCAP	National Climate Change Action Plan
NCCRS	National Climate Change Response Strategy
NGO	Non Governmental Organization
OIAST	Online Information Service for Non-chemical Pest Management
SADC	Southern Africa Development Community
SEI	Stockholm Environment Institute
SIDA	Swedish International Development Cooperation Agency
TROCAIRE	Overseas Development Agency of the Catholic Church in Ireland
UK	United Kingdom
UKCIP02	United Kingdom Climate Impact Programme 02
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. INTRODUCTION

1.1 Climate Change and Climate Change Adaptation Practices

The world's climate continues to change every year. In particular, impacts of climate change are now worse than the years before. (Adger et al, 2003). It is evident that mankind is aware that the global climate is changing, nevertheless, the extent and the rate to which the change is occurring is not fully known to scientists (Karl & Trenberth, 2003). Debate on climate change, its causes and the mechanisms behind it dates back to the beginning of the 19th century (Hulme et al, 2001). From that time to now, scientists have undertaken research to provide more evidence on the extent to which the climate is changing (IPCC, 2007).

The past century has seen an increase in climatic events worldwide (IPCC, 2007). The intensity and magnitude of flooding in Africa, the typhoons in Asia as well as the hurricanes in North America have increased over the years (IPCC, 2007). Scientific evidence shows that the past century has seen a rapid increase in the global temperatures of about 0.8˚C (IPCC, 2007). Although this figure seems insignificant, it translates to an average rise in sea level by about 1.88mm per year, a record reported between 1961 and 2003 thus implying looming disaster such as flooding for low-lying delta countries such as Bangaladesh (IPCC, 2007: 31). Furthermore, increase in global temperature can be accounted for from drastic observable changes such as decrease in snow and ice cover in the arctic region (IPCC, 2007). Scientist argue that the rate at which the earth is warming is much faster than anticipated (Dawson et al, 2011). In fact, reports state that Greenland is melting at a faster rate than the rate at which scientific reports are produced (IPCC, 2007). Other reports estimate that Greenland could lose majority of its ice in less than 2000 years (Howat et al, 2008). If this would happen, it could imply dire consequences especially to low-laying countries such as Bangaladesh, that are already experiencing major flooding and drainage challenges as a result of impacts of increased sea level in the delta region (IPCC, 2007).

The intensity and magnitude of climatic events is expected to increase across the globe (IPCC, 2007). Reports state that North and South America would experience an average increase in precipitation; in contrast, other regions such as the Sahel, Mediterranean and southern Africa are anticipated to experience a decrease in precipitation (IPCC, 2007; 2001a). The increase and decrease of precipitation across different regions is also expected to be accompanied by extreme climatic events such as tropical cyclones, typhoons, storm dust, tornados, El-Niño and La-Niña (IPCC, 2007). These events have been reported to have lead to landslides, damage to property and even loss of human life (IPCC, 2007).

Similarly, the impacts of climate change are anticipated to, not only, affect the human population but also, affect the development sectors such as the economy, environment and political systems (IPCC, 2001a; Hulme et al, 2001). These changes are anticipated to gradually occur over an extended period of time within a given area (IPCC, 1994). Impact and vulnerability assessment studies have been carried out to ascertain the magnitude of these changes in order to cope with the sudden events (Carter et al, 2001). The ability of people to cope with the impact of climate change depends on their exposure to the impacts and adaptive capacity (IPCC, 1994; 2007). Sudden

changes such as the above would affect people's livelihood and ecosystems in various ways for instance; a sudden change in the temperature range can disrupt species optimum range and further cause extinctions (IPCC, 2001). In response, people may adjust to these changes such as through diversifying livelihoods, adjusting farming practices in response to weather patterns, initiating conservation protection plans for wildlife resources among others (UNFCCC, 2007).

While debate goes on in the international arena to find ways to reduce the anthropogenic causes of climate change, humans on the other hand have been forced to live with the consequences of climatic events such as hurricanes, drought and flooding (UNFCCC, 2007). Over the years the talk has now shifted from a focus on mitigating climate change to also include adapting to the impacts of climate change (IPCC, 2001). To incorporate adaptation, there is need to understand the extent to which the climate could change and how these changes would impact society, livelihoods and ecosystems (IPCC, 2001). Consequently, this knowledge and information builds on the adaptive capacity of humans and ecosystem to adjust and cope with the impacts of climate change (UNFCCC, 2007).

Adaptation thus provides an opportunity for humans to adjust their livelihood in response to the sudden impacts of climate change (IPCC, 2007). For vulnerability communities such as those in Africa and other developing regions, adaptation is important in order to reduce the negative impact of climate change on humans and to enable humans to live within certain limits of these changes (IPCC, 2007). Adaptation therefore involves understanding the potential impacts of climate change, its exposure and the sensitivity of ecosystem and livelihoods to impacts of climate change. Adaptation can be achieved by reducing the vulnerability to these impacts and increasing resilience of a community and ecosystem to impacts of climate change. To do this, efforts need to be put to build the adaptive capacity of a system, this is can be done by improving the economic wealth, infrastructure and technology, institutions and services, information, knowledge and skills, equity and social capital of a community (IPCC, 2007; UNFCCC, 2007). Building the adaptive capacity of a community therefore can be understood as a 'top-down approach or as a 'bottom-up' approach (IPCC, 2007, Füssel, 2007). As a top-down approach, often carried out at the government level, adaptation is incorporated in the development planning framework. This approach is interpreted through policy action such as construction of dykes and flood-proof structures, or providing incentives for relocation of people through planned budgeting (Füssel, 2007). In contrast, at the local level, community practitioners incorporate adaptation through rolling out projects and programme. This approach, often referred to as the 'bottom-up' approach, includes supporting community groups to practically take up activities such as changing farming practices, diversifying livelihoods, keeping fewer breeds of livestock, breeding high quality cattle or using improved seed varieties (IPCC 2001 & 2007; Füssel, 2007). Combining these two approaches aims at building a community's adaptive capacity.

1.2 Climate Change Adaptation Practices in Kenya

Developing countries such as Kenya is highly vulnerable to impacts of climate as it highly relies on its natural resources for economic growth and development (Mutimba et al, 2010). Kenya is a country found in the east coast of Africa. The country has diverse landscape and agro-ecological zone that supports large agricultural and tourism activities (Mutimba et al, 2010). Subsistence agriculture is mainly practiced by local small-holder farmers that rely on the rainfall patterns (Mutimba et al, 2010). Studies carried out indicate that the country would experience a general increase in temperature and a decrease in rainfall in future due to impacts of climate change (GoK, 2010).

For a country that heavily relies on rain-fed agriculture, and its natural landscapes, changes in precipitation and temperature would also affect the economy as these sectors are the main economic back-borne of the country, thus making Kenya most vulnerable to impacts of climate change (Mutimba et al, 2010). The Kenya government has taken prompt measures to respond to the effects of climate change by commissioning a study that maps out the vulnerable sectors and prioritize the actions to be taken (GoK, 2010; 2013). The National Climate Change Response Strategy and the National Climate Change Action Plan provides a framework to dealing with climate change issues in Kenya (GoK, 2010; 2013). To enhance the adaptive capacity of the country non-state actors such as non-governmental organizations (NGOs), community practitioners and civil society organizations have also joined this bandwagon (GoK, 2010). In response, NGOs and other community practitioners roll out projects and programme, awareness and advocacy campaigns aimed at building the adaptive capacity of communities especially in the agriculture sector (Mutimba et al, 2010). These programme support the country's adaptive capacity through providing information, knowledge and skills, supporting social capital by improving social networks, strengthen institutions and services thus supporting economic growth and reducing the vulnerability of the community (IPCC, 2007, UNFCCC, 2007). Adaptation therefore entails that practitioners understand the impacts of climate change, how the climate would change in future and developing practices in anticipation of these climatic conditions (IPCC, 2007). To understand the historical and future climatic conditions involves incorporating climate information into adaptation practices.

Climate change adaptation practices in this study are taken to mean activities undertaken to help cope with or reduce the observed or and projected impacts of climate change on the community, ecosystem or livelihood (IPCC, 2007). Whereas climate information in this study is take to mean a collection of historical and future climate data. This data includes metrological data i.e. historical and future seasonality data that incorporates the observed historical weather events (rainfall, temperature etc), indigenous and local climate data and climate change scenarios. Therefore this study focuses on the bottom-up approaches supported through non-state actors, particularly from community practitioners including NGOs and CBOs (Community Based organizations). This category of practitioners is taken in order to get a better understanding of local adaptation practices that are directly affecting community livelihoods on-the-ground and they provide a link to grass-root adaptation practices in Kenya (GoK, 2010). These grass-root adaptation practices include: livelihood diversification projects, promoting cultivation of indigenous crops and varieties of drought-resistant crops, water storage and cattle breeding projects among others (GoK, 2010; 2013). The study took a

case study approach by carrying out participatory observation and in-depth interviews of community practitioners working in three NGOs namely, Arid Lands Information Network (ALIN), Environment Liaison Centre International (ELCI) and the Kenya Climate Change Working groups (KCCWG). The findings from the case studies were further supported with in-depth interviews from twelve other community practitioners including agricultural extension workers, research scientists and local NGOs. This approach was taken not aimed at generalizing findings, but rather at getting a detailed description of climate change adaptation practices and a better understanding of how things actually happen in practice.

In order to understand how climate change adaptation practices in Kenya come into being, this study applied practice theory to understand how practices are enacted. The study perceives that human action is organized through practices. In other words, through this study, I imply that, in order to understand social change, it is essential to understand human practices (Shove et al, 2012). Practice theory is therefore applied in this study in order to get a better understanding of climate change adaptation practices enacted by community practitioners in Kenya. This study understands a practice as the integration of elements of 'material, meaning and competence' that are linked together through their performance (Shove et al, 2012:22-5; Arts et al, 2013) and that these elements are situated in practice (Bevir, 2005).

Therefore, this study views adaptation as a practice as it involves community practitioners implementing a set of activities that requires the coordination of skills, information and techniques aimed at responding to the impacts of climate change. Take for example the practice of preservation of pasture as an adaptation practice, it involves relating the pasture (material elements) with the technical knowledge required to convert grass to hay, (competence), and the significance of preserving pasture in anticipating of a drought (meaning). Likewise, climate information therefore relates with adaptation practice in this way, take for example the same practice of preservation of pasture, when pastoralists incorporate climate information e.g. through indigenous local climate data, this implies that pastoralists can observe the behaviour of animals, such as goats feeding on particular herbs or tubers (material elements) and through this they have the skills and know-how to understand and interpret (competence) the meaning and implication of that action in relation to climate condition (meaning), in this way pastoralists are able to know when to start preserving pasture and what type of pasture to preserve or even decide if they would rather sell-off their livestock in anticipation of the drought.

In other words, climate change adaptation and climate information as practices incorporates elements of material, meaning and competence that are linked and situated in practice. This requires one to understand the elements that compose these practices (materials, meanings and competences), how they are linked through their performance and finally, how the practices are situated in the context in which they occur. Therefore this study incorporates concepts of material, meaning, competence, performance and situated agency to explain how climate change adaptation practices in Kenya are enacted. For elements I mean material, meaning and competence. In other words, by material elements I imply studying objects, things, physical and bio-physical entities that make up a climate change adaptation practices. Likewise competence in this study is taken to mean technical knowledge and skills while meaning is taken to mean symbolic importance, goals and

motives. The concept of performance in this study is taken to mean 'active doings of a practice' that occur in time and space and are evaluated through understandings, these understandings are represented through sharing of information and experiences and best practices, whereas the concept of situated agency is in this study was taken to mean the social context including traditions, rules, networks and nature.

1.3 Problem Statement

The effects of climate change in Kenya are getting worse every year (Mutimba et al, 2010). Every year the drought becomes more severe and is prolonged leading to massive loss of livestock among pastoralist communities (SEI, 2009). In Marsabit, in northern Kenya, for example, livestock losses were reported up-to about 70% (GoK, 2013). This estimate is extremely high considering that livestock forms part of the livelihood for the community in this area (GoK, 2013). In western Kenya, particularly in Budalangi, major flooding has often led to loss of livelihood, property and migration of communities from the flood prone land (GoK, 2013). In the past, communities have responded to climate variability by making adjustments in their livelihoods, for instance, by changing the cropping pattern and adjusting livestock pastures (Mutimba et al, 2010). These adjustments have made it possible for the communities to cope with the impacts of climate change on their livelihood (Mutimba et al, 2010; SEI, 2009). In the recent past however, there are more cases reported of communities shifting from traditional practices, such as pastoralism to farming (The People Newspaper, 9th November 2013). These sudden changes come about as climate variability becomes unpredictable and communities are no-longer able to immediately effective respond to the impacts of climate change (GoK, 2013).

Local climate change adaptation activities are often implemented through projects and programmes that are administered by community practitioners (Mutimba, 2010). This involves implementing projects such as livelihood diversification, construction of water tanks/ pans, building flood protection structures, changing of farming practices among others (Mutimba, 2010). These activities are aimed at assisting communities build their adaptive capacity by supporting them to live with the impacts of climate change with minimal impacts on their livelihoods. Practitioners often generate climate adaptation practices based on their understanding of the climatic situation and making use of climate information (Adger et al, 2003). This climate information can be in the form of data from meteorological stations, early warning systems, reports from historical climatic events local and indigenous climate knowledge or through climate change scenarios (Carter et al, 2001; Mutimba, 2010).

In countries such as the UK, studies have shown that practitioners incorporate various forms of climate information. One prominent source of climate information is the application of climate change scenarios. These scenarios are adjusted, reviewed and incorporated into climate planning and adaptation action often shaping the adaptation activities (Gawith et al, 2009). This type of information has been applied in areas such as in spatial planning, urban development and in government decision making (Lorenzoni et al, 2000; Arnell et al, 2004; Solecki & Oliveri, 2004; Sheppard et al., 2011). Likewise, in the US, climate information has shaped the type of adaptation practices carried out by farmer associations. For example, climate information has been

incorporated into crop management and the information is used in making decisions on potential areas for growing crops (Jagtap et al, 2002).

Adaptation practices carried out in developed countries such as those in the UK and US differ from those of developing countries such as Kenya. For one, the social contexts differ, for example, the traditions, livelihood practices, environmental conditions, the form of climate information among others (Jagtap et al, 2002; Gawith et al, 2009, SEI, 2009). These social contexts influence the type of adaptation practices that practitioners undertake. Adaptation practices in Kenya also differ based on the social context that they are found, this could be based on the geographical region, climatic area or culture and traditional practices of different community groups (Mutimba et al, 2010). Application of climate information is therefore situated in the social context in which adaptation practices are found. Applying climate information into adaptation practices would imply that communities are better prepared for the anticipated impacts of climate change in a particular region (Mutimba et al, 2010). It therefore behoves practitioners that in order to understand and integrate climate information in adaptation practices, it would require that practitioners understand the social context in which climate adaptation practices are situated and what elements make up these practices. Till today scientists in Kenya, have no clear understanding of the social context in which adaptation practices are situated and how elements of material, meaning and competence come into being to produce adaptation practices and the extent to which climate information is performed in adaptation practices in Kenya. This study therefore seeks to further our understanding of the social context in which practitioners in Kenya are situated, how elements come about to enact climate change adaptation practices in Kenya and how climate information is performed in these adaptation practices.

1.4 Research Objective and Research Questions

The objective of the study is to: **understand the social context in which practitioners produce climate change adaptation practices and how climate information is performed in adaptation practices in Kenya.**

This objective will be achieved by responding to the following general research question: **In what social context are climate change adaptation practices situated, what are the elements that constitute practices and how is climate information performed in adaptation practices in Kenya?** This general research question will be broken down into the following specific research question**s:**

1) What elements constitute climate change adaptation practices in Kenya and how are they integrated and linked?
2) In what social context are climate change adaptation practices in Kenya situated?
3) How is climate information performed in adaptation practices in Kenya?

1.5 Structure of the Report

This report contains seven chapters. The current chapter [Chapter 1] highlights the justification of this study. This then prepares the ground for Chapter 2 in which I review relevant literature on climate change adaptation and climate information. This is used to show how climate change adaptation and climate information relates to each other in the global, regional and local context. This chapter also defines the scope of the study by expounding on terms such as community practitioners, climate information and climate change adaptation practices that will be applied throughout this study. Chapter 3 consists of the theoretical and conceptual framework. In this chapter, I focus on practice theory and apply it to the context of this study. The chapter ends by describing the concepts used in the study that is concepts of: material, meaning and competence, performance and situated agency. Chapter 4 introduces the research methods and highlights how the data was collected, analysed and presented. Chapter 5 presents the findings of the study. In chapter 6, I present the discussion and reflect on the theory and methodology used in the study. Finally in chapter 7, I present the conclusion and recommendations from the study.

2. CLIMATE ADAPTATION PRACTICES IN KENYA

In this section I provide a review of the relevant literature on climate change adaptation and climate information. The chapter begins by defining the scope of the study and describing the key terms used in this study. This chapter then takes a step further in examining how adaptation practices have been carried out in Africa and how climate information has been applied and integrated with adaptation practices. It does this by giving examples from Africa and relating with examples from developed countries. Finally the chapter highlights how climate adaptation has been carried out in the Kenyan context.

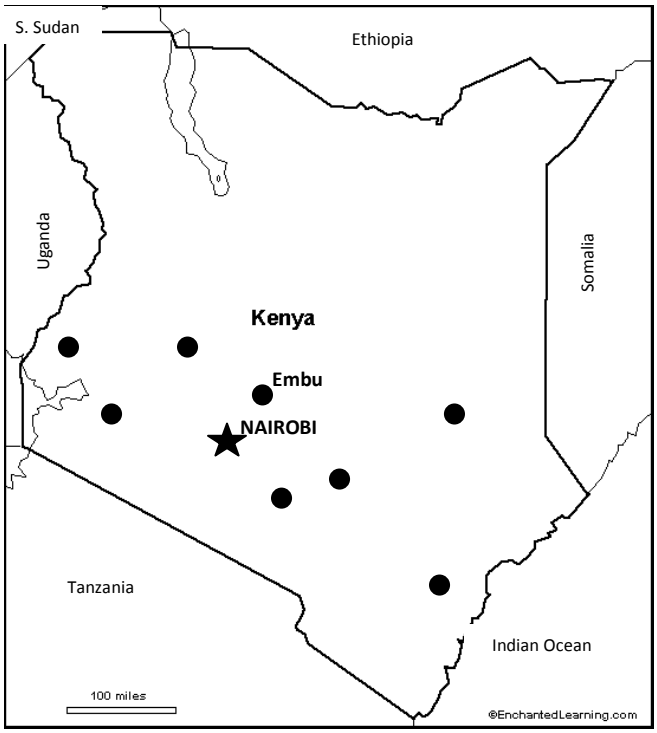
2.1 Defining the Scope

This study will focus on understanding climate change adaptation practices among community practitioners in Kenya. It will also aim to understand how climate information is used and applied to adaptation practices. The following section defines the scope of the study by defining the key terms used which include climate information, community practitioners and climate change adaptation practices.

2.1.1 Kenyan Context

The research is carried out among community practitioners in Kenya. Kenya lies along latitude 4˚ North to South and lies between longitude 34˚ - 41˚ East (Mutimba et al, 2010). It borders Ethiopia and South Sudan to the North, Tanzania from the south while Uganda is found on the east side of the country. The Indian Ocean and Somalia border the country to the west (Mutimba et al, 2010; McSweeney et al, 2010). It consists o f tropical climate with two rainy seasons for the short rainy season lasting from October to December while the long rainy season lasts from March to May with an average rainfall of about 50 -200mm per month (although this varies per location and season) (McSweeney et al, 2010). Temperatures vary across the country with ranges between 15˚ and 29˚C. The country has a diversity of landscapes form low-lying region in the eastern part of the country to high mountainous hills and region found throughout the country (Mutimba et al, 2010). The Great Rift Valley runs from western part of the country through the central part. It is in this region that the soils are fertile and productive for agricultural and other farming systems such as livestock production (Mutimba et al, 2010). Favourable climate for agriculture coupled with good fertile soils makes Kenya productive in terms of agricultural productivity. Although, it is estimated about 80% of the land is arid or semi-arid, mainly found in the northern part of the country (Mutimba et al, 2010). Communities residing in these areas often practice pastoralism as their main source of livelihood. This large diversity in land features has resulted in a diversity of economic activities such as farming, fishing, and tourism among others. Rain-fed agriculture contributes to about 26% of the country's GDP (Mutimba et al, 2010). The other main economic sectors such as in tourism, fisheries often rely on natural resources. This implies that Kenya is highly vulnerable to the impacts of climate change due to its high reliance on natural resources which are often dependant on the climatic situation (Mutimba et al, 2010). The research took place in Nairobi (indicated by a star in the map below) where the community practitioners are headquartered. The map also indicates the project sites in which these practitioners carry out their projects and regularly visit sites to implement

their project activities (NB the project sites were not visited during the research, except for a project site in Embu located 120km northwest of Nairobi as shown in the map below)



Source: http://www.enchantedlearning.com

Figure 1: Map of Kenya indicating the project sites of the 3 case study organizations

2.1.2 Climate Information

Climate related literature produces a lot of information on climate change that may be too technical for the general audience. Certain terms are used interchangeably and may have various meanings and implications in climate studies. Climate information is one such term. Several studies have come up with varying definitions of climate information.

The United Nations Environmental Programme (UNEP) defines climate information to 'include baseline observed data (range of time steps), trends, variability and higher order statistics, extremes, inter-annual variability, and inter- decadal variability, for both the past and projected future climate. It also includes the associated information and assistance to interpret and use these data' (UNEP, 2009:4).

Other institutions such as the International Institute for Climate and Society (IRI) have defined climate information as 'a summary statistics of climatic variables (rainfall, temperature, wind, etc.), historic time-series records, near-real time monitoring, predictive information for daily weather, to seasonal to inter-annual time scales, and climate change scenarios. It covers a range of spatial scales and can include derived variables related to impacts, such as crop water satisfaction indices, epidemic disease hazard or stream flow.' (IRI, 2006: 4).

Therefore, in light of the above definitions and putting the context of this study into perspective, climate information in this study is defined as a collection of past and future climate data. This data

includes metrological data which includes past and future seasonality data, it also incorporates the observed past weather events (rainfall, temperature etc), indigenous and local climate data this includes observations from traditional local weather men (men who could predict the weather by observing in plants, animal feeding behavior etc) and climate change scenarios.

The study will from time to time focus on climate change scenarios implemented by practitioners through projects and programmes. This study also takes into account that practitioners involved in adaptation practices are mainly practitioners from NGOs, and other civil society organizations. By considering climate change scenarios as part of climate information, this does not imply that mid-term inter-seasonal and inter-annual variations will not be taken into account, on the contrary, this type of information will also be considered. However emphasis will not be on daily weather forecasts but on seasonal and long term climate data (Osbahr et. al., 2008; Füssel, 2007). With this in mind, the study chooses to focus on climate phenomena that are linked with mid to long term adaptation activities that are carried out community practitioners in Kenya.

It is important to note that many articles distinguish the difference between climate scenarios and climate change scenarios, this study borrows the definition of climate change scenarios from (Carter et al, 2001, p163), "climate change scenarios is the difference between some plausible future climate and present day climate". The study does not seek to draw out distinction on scenarios but rather generally looks at outcomes of climate scenarios in use in adaptation practices, hence the term climate scenarios and climate change scenarios in this study refers to the same thing and may be used interchangeably.

2.1.3 Community Practitioners

This study will seek to understand how community practitioners enact adaptation practices. They will be the main focus of the research. The term community practitioners is used to refer to non-governmental organizations (NGOs), civil society organization, faith-based organizations and community based organizations (CBO) that implement on-the-ground climate change community projects in Kenya (Mutimba et al, 2010). These groups of practitioners are selected as they directly work with community groups on the ground through implementing projects and programmes. Community practitioners in this study will also include practitioners from research organizations that work directly with community groups by providing technical information to the community groups such as through agricultural extension officers. The study chose to focus on these community practitioners as they have the technical capacity to understand the technical forms of climate information such as meteorological data and climate change scenarios and are in a position to interpret this information to community groups. The term community practitioners and practitioners may be used interchangeably to mean the same thing.

2.1.4 Climate Change Adaptation Practices

Climate change adaptation practices in this study are taken to refer to any activities undertaken to help cope with or reduce the observed or/ and projected impacts of climate change on the community, ecosystem or livelihood (IPCC, 2007). The adaptation practices that are of interest in this study are on-the-ground practices that are initiated by community members, through support and facilitation of the community practitioners (IPCC, 2001; 2007). These adaptation practices (on-

the-ground) are selected because they are practices often initiated by community practitioners in form of projects and programmes, and these practitioners (community practitioners) are the main focus of this study.

2.2 Role of Practitioners in Climate Adaptation

NGOs and civil society organization play a key role in providing a direct link with communities by implementing on-the-ground activities. In order to bridge the gap between science and action, these practitioners (NGOs) not only require a good understanding of the climate science, but also an effective system in which they can interpret and communicate the science to the target community thus initiating climate practices (Ziervogel & Zermoglio, 2009). There is therefore a need to move from the "business as usual" practices to more robust, adaptive and bioregional practices that take future climatic changes into account (Brooke, 2008).

Practitioners should have in place measures meant to incorporate short-term, mid-term and long-term plans in their adaptation practices (Heller & Zavaleta, 2009). Each response from the practitioners requires a different set of climate information, prediction and scenario outputs (Heller & Zavaleta, 2009). Studies have shown that climate scenarios have been used in communication and raising awareness on climate related risks and disasters, in planning, scientific research and in policy and decision making (Gawith et al., 2009). Practitioners have to face the difficult challenges of planning to adapt which incorporates exploring current and future opportunities and threats and understanding the links between the two in order to define the adaptation paths to take (Brooke, 2008). It is therefore vital for practitioner to have a technical know-how of various climate parameters and the context in which these conditions may change in order to develop an effective adaptation plan (Ziervogel & Zermoglio, 2009).

2.3 Role of Climate Information in Climate Change Practices

2.3.1 Relevance of Climate Scenarios for Practitioners

Climate scenarios present a range of descriptions of how the future climatic state would look like (Carter et al, 2001). This information is important for practitioners to apply in decision making and daily practices (Carter et al, 2001; Gawith et al, 2009). Climate change scenarios have been produced and used widely in impact and adaptation studies (Carter et al, 2001). In the past, scenarios were mainly produced for research purposes by scientists and used by scientists. This has changed over the years, and climate scenarios are used in research on impacts as well as providing information for end users in planning and adaptation (Carter et al, 2001). One such example is the application of the UK climate scenario- UKCIP02, it has been produced to assist decision makers in both the public and private sectors with information on climate change in order to assess the impacts and make decisions on adaptation to these impacts (Gawith et. al, 2009). For example, it was reported that the most common use of the UKCIP02 climate scenario was for communication purpose, the scenarios were used as a communication tool to communicate impacts of climate change for awareness raising and adaptation in the UK. This was then followed closely by the use of the scenarios for research in both academics and action oriented research, finally a small percentage

of the scenarios were used for decision making and policy purposes that led to the development of action plans and strategies (Gawith et. al, 2009).

2.3.2 Use of Climate Information in Climate Change Adaptation Practices

There is a disconnect between climate information, climate related activities and uptake of information by practitioners (Vogel & O'Brien, 2006). Climate information must be applied to enhance climate action. As one study reveals, "for climate information to benefit climate-sensitive sectors and society in general, it must induce changes in the decision-making process and in the actions taken by stakeholders" (Jagtap et al, 2002, p. 422). Various stakeholders have in the past used different methods to generate and use climate information. Studies of large scale farmers in the US (Florida) has shown how farmers have made use of climate information in taking management decisions to enhance their yield by reducing the vulnerability to climate related events (Jagtap et al, 2002). For example in Florida, USA, historical climate data has been used by farmer association groups and projected to estimate future climatic conditions of the areas suitable for growing farm produce (Jagtap et al, 2002). This study shows that, although farmer groups were willing to use climate information for their management decisions, they were keen on getting information that directly relates to how their yields and input would be affected in the specific areas (Jagtap et al, 2002). In other areas, it has been reported that climate information is used in the production of climate outlook data gathered from the ENSO – El Niño Southern Oscillation (Vogel & O'Brien, 2006). The information is aimed at minimizing risk by informing end users of potential outcomes in which decisions are taken.

Climate information is important in order to effectively plan adaptation practices. Although debate is on-going on what actually accounts for actual adaptation practices (Berrang-Ford et al, 2011), several practices have been identified as adaptation practices to include 'river-basin management, wetland conservation, irrigation projects, drought analysis, energy production such as use of efficient cook stoves, agroforestry, enhancing traditional agricultural practices, crop resilience practice, advocacy, awareness and environmental education practices, water adaptation practices among others (Rojas Blanco, 2006). Adaptation practices hence are said to be better understood by 'learning by doing', they are not static but revolve around looking at practices that are compatible with the changing climate variations (Rojas Blanco, 2006). In all the named adaptation practices above, climate information can play a role in providing adequate information that will enable practitioners make proper decision on what best strategy to take that will enable adaptation in the mid to long term (Berrang-Ford et al, 2011; Rojas Blanco, 2006). Practitioners play a great role in collating climate information from various national and international data source and synthesizing the information to fit into existing community adaptation tools/ climate adaptation practices. This would eventually enable them to incorporate long term adaptation measures (van Aalst et al., 2008). Practitioners who are able to develop their climate adaptation practices in relation to the climate information, are able to help communities become less vulnerable to impacts of climate change by promoting climate-resilient activities, thus giving priority to adaptation practices that would be termed urgent over other activities (Curry, 2001; Vogel & O'Brien, 2006).

2.4 Relevance of Climate Information in Africa

Climate scenarios are of great importance in vulnerability assessment studies and impact studies in Africa (Ziervogel & Zermoglio, 2009). However, there is a gap in how climate data is represented and used in climatic studies in Africa (Ziervogel & Zermoglio, 2009). Climate change data used in Africa is mainly generated by several international organizations, few organizations in Africa have developed the competency and skills to generate climate change models (Ziervogel & Zermoglio, 2009)

Africa is a continent with varied and varying climatic conditions (Hulme et al, 2001:145). This variability of climatic conditions increases its vulnerability to impacts of climate change (UNFCCC, 2007 p 19). Climate related stress and low adaptive capacity has led to slow adaptation to these impacts (IPCC, 2001b). Prolonged droughts and floods in different regions have disrupted the socio-economic activities of people who depend on climate-related livelihood options (UNFCCC, 2007 p 19). Impact and vulnerability assessment studies carried out on Africa indicate varying changes and extreme events across Africa (Boko et. al, 2007). For example in regards to temperatures, there is an expected warming of about 1.5 times the current warming across the continent, further, there is an anticipated decrease in annual rainfall in the Mediterranean, Sahel and Southern Africa regions with an anticipated increase in mean annual rainfall in East Africa (Boko et. al, 2007). The intensity and frequency of extreme events such as drought and floods are expected in the areas that these events currently occur and it is anticipated to spread to new areas where these events have not been reported before (Boko et. al., 2007). Impact studies carried out by Hulme et al, (2001) indicate that the African continent will face great water shortage within the middle of the 21st century (Hulme et al, 2001). There is little information on exactly how these extreme events will specifically affect specific regions in Africa (Hulme et al, 2001).

With such expected impacts, climate scenarios are developed to understand future impacts of the climate in regions such as Africa (Hulme et al, 2001). Researchers like Hulme et al (2001) conducted studies about the African climate using GCM (General Circulation Models) information and downscaling the information for the African continent. The analysis carried out indicated an overall warming between 1.4°C to 1.6°C from the equatorial to the Sahara and semi-arid regions with an increase of mean sea level along the coastline by about 25cm by 2050 (Hulme et al, 2001, p. 147). These analysis from climate scenarios have been used to determine changes in precipitation for the southern Africa region, and further used by the Southern Africa Development Community (SADC) to draw out the impacts of climate change on key sectors in the region such as in agriculture, health, biodiversity and wildlife within a time-frame of 2050 (Hulme et al, 2001, p. 147). Although focus has now shifted to application of these scenarios within the African continent, there still exists a challenge in downscaling the output from the GCM to finer temporal and spatial scales that are regional based (Hulme et al, 2001, p. 147). Information from both climate scenarios coupled with observed records of climatic events have been used to provide data for meteorological stations across Africa (Ziervogel & Zermoglio, 2009).

Information is crucial for African governments and other practitioners to plan for better adaptation aimed at reducing vulnerabilities of communities and ecosystem to the impacts of climate change. Climate scenarios are hence key in providing information on future climate conditions to help in

decision making and adaptation in Africa (Ziervogel & Zermoglio, 2009). Users such as farmers, non-governmental and civil society organizations and policy makers, refer to the output of climate change scenarios to provide them with information to develop adaptation strategies and make key development decisions (Gawith et al, 2009).

2.5 Climate Change in Kenya

2.5.1 Key Developments in the Climate Change Debate in Kenya

Kenya has been affected by the impacts of climate change as evident from increase in minimum and maximum temperature in most parts of Kenya for the past 50 years and decline in rainfall pattern, with some being erratic and unpredictable (GoK, 2010). Projected climate scenarios for eastern Africa indicate that Kenya is expected to experience increased precipitation across the country with decreased precipitation along the coastal strip, increased temperatures and evaporation rates, flash floods, recurrent droughts and erratic weather patterns (GoK, 2010). Events such as the 1999/2000 La Nina droughts resulted in about 4.7 million Kenya affected by food shortage and starvation, not to mention the 1998 Elnino that caused massive flooding all over the country disrupting road and transport network and caused death as people were swept away by floods (GoK, 2010). It is these events and others that raised the call for addressing climate change at the national level with the government taking a lead role in addressing these challenges. In 2010, the government launched the National Climate Change Response Strategy (NCCRS) that would pave way to give a guide on the action to take as a country to respond to issues of climate change (GoK, 2010). Climate change was no-longer considered just an environmental issue, but it was evident that impacts of climate change will affect the economy and development sectors in Kenya (GoK, 2010). To operationalize the climate change response strategy, the government developed the National Climate Change Action Plan 2013 – 2017, this plan is set to prioritize climate action by reducing Kenya's vulnerability to climate change and taking advantage of emerging opportunities to move towards a low carbon resilience pathway by integrating climate change action within existing frameworks and policy making process (BEACON, 2013). The action plan takes cognisance of existing policies such as the National Environment Policy 2012, which addresses impacts of climate change by specifically calling on key stakeholders to incorporate early warning and response systems in climate change related risks and disasters (BEACON, 2013). Another milestone to Kenya's response to impacts of climate change is through the climate change authority bill 2012, which has been mainly initiated by civil society members to address climate change issues at different levels. Although the bill has not been ascended into law, it provides a guide and framework for addressing climate change issues while reducing Kenya's vulnerability to climate change (BEACON, 2013). The Climate Change Action Plan recognizes the value of climate information in developing of policies and plans that support national adaptation planning thus reducing the country's vulnerability. It recognizes the importance of collating accurate climate information that will feed into assessing the vulnerabilities and climate related risks in order to champion pathways for adaptation and mitigation in Kenya (GoK, 2013).

2.5.2 Climate Change Adaptation Interventions in Kenya

With expected extreme events such as recurrent prolonged droughts and flash flood over several parts of the country, communities that directly depend on natural resources for their livelihood are going to be adversely affected (GoK, 2010). Such events will also impact on food insecurity,

infrastructure and access to water will accelerate conflicts among communities over natural resources such as grazing land and pasture for livestock (GoK, 2010). In response to the climate change events in Kenya, different stakeholders are taking up various responses to addressing climate change challenges. Stakeholders ranging from government, private sector, civil society and rural communities are all playing various roles to minimize risks and vulnerabilities to climate change in Kenya (Mutimba et al, 2010). Civil society organizations have been in the fore front in addressing issues on climate change that affects rural communities. Civil society in Kenya has been in the forefront on climate change matters since Kenya hosted the 12th Conference of Parties of the UNFCCC in 2006 in Nairobi (GoK, 2013), from this, civil society organizations such as the Kenya Climate Change Working Group, (which is a consortium of civil society organizations working on climate change in Kenya) were born. KCCWG has addressed climate change issues through awareness and advocacy campaigns and recently through rallying for the adoption of the climate change authority bill by policy markers. Other organizations are working with rural communities to implement different climate change adaptation interventions across the country. Communities with support from civil society organizations are taking on adaptation interventions such as planting indigenous crops, rainwater harvesting techniques, livestock insurance projects, livelihood diversification, preservation of pasture, for livestock among other interventions. These interventions are carried out alongside awareness and advocacy work on the impact of climate change (GoK, 2010; 2013; Mutimba et al, 2010).

These interventions are just some examples of what community practitioners are doing to adapt to climate change in Kenya and enhance a climate-resilient community (Mutimba et al, 2010). Respective line ministries such as the Ministry of Environment and Natural Resources are therefore tasked with collaborating with government research institutions such as the Kenya Agricultural Research Institute (KARI) in producing relevant climate data that can be applied in adaptation interventions (GoK, 2013). This process involves working with organizations such as the Kenya Meteorological Department (KMD) in making sense of climate data for application for adaptation. The Kenya Agricultural Research Institute (KARI) has been carrying out research on agricultural production for a couple of years, in the recent past, scientist from KARI have worked in collaboration with scientists from KMD to make sense of climate data such as seasonality data that is used in agronomic practices. One such example is the application of this data to map out the areas in which different type of crops are productive (GoK, 2010;2013, Mutimba et al, 2010).

In Kenya, where rain-fed agriculture is highly relied on as a source of livelihood by small and medium scale farmers, making use of climate information plays a role in employing better plans to adapt the agriculture sector to impacts of climate change (GoK, 2010). Wildlife and natural resources are also a key resource in Kenya, contributing highly to the country's GDP, implication of climate change will not only impact on these resources but also on the socio-economic well being of the country (GoK, 2013). Other practitioners have over the years made use of early warning information from the Meteorological Department, to give an indication of expected climatic situations such as expected droughts (GoK, 2013). Such information is key especially to pastoralist communities who may need early warning systems in order to plan for proper destocking (selling off livestock to reduce the herd) of their livestock before the onset of a prolonged drought (GoK, 2010; 2013).

3. THEORETICAL FRAMEWORK

This section will discuss the theoretical approach used. By doing this, I not only give focus to my study but also attempt to draw out relations between concepts that emerge from the theory, thus framing my research problem and giving it direction. I will begin by introducing practice theory and further highlight the history and development through this theory. I will then justify why I choose this theory. Further, I will describe how elements are enacted to practices and how these elements are linked together through their performance.

3.1 Practice Theory: Theoretical Framework

This study understands a practice as the integration of elements of 'material, meaning and competence' that are linked together through their performance (Shove et al, 2012:22-5; Arts et al, 2013) and that these elements are situated in practice (Bevir, 2005). This approach will require one to understand the elements that compose these practices, how the elements are linked through their performance and how the practices are situated in the context in which they occur.

Practice theory is applied by first looking at the developments in practice theory, this will discuss how practices are generated by looking at how different authors conceptualize practices, I will then narrow down to focus on the work of Shove et al (2012) by discussing practices as the integration of elements of materials, competence and meaning and how these elements are performed. I will then discuss the social context in which these practices are situated using the concept of situated agency (Bevir, 2005; Arts et al, 2013).

3.1.1 Developments in Practice Theory

The concept of 'practice' means many things to many people, depending on the school of thought that one subscribes to. A practice can be as simple as "anything people do" (Ortner, 1984: 149). The practice theory may not be easily defined, as simply as the descriptions above; it however, presents a framework that allows better understanding of social processes such as projects, career, transactions or development cycles (Ortner, 1984: 158). Practice theory has no precise definition; however it encompasses the aspect of human beings acting as agents, transforming and changing their social worlds through a repeated set of actions (Ortner, 1984: 148).

In an attempt to decipher a practice, practice philosophers have over time identified three key elements that attempt to describe it; these are: human actions, structure and the relationship between the two that constantly transforms them (Ortner, 1984; Giddens, 1984). These elements try to explain how human action functions within a given system while following a set of rules, it also explains how these rules which are embedded in a structure, actually define how humans act and respond (Ortner, 1984; Giddens, 1984). In essence, practice theory tries to link up the structuralism approach and the individualism approach (Giddens, 1984). In summarizing literature from practice theorists, Ortner (1984) notes: "a practice tries to explain the relationship between human action on one hand and global entity also referred to as system on the other hand" (Ortner, 1984:148).

In the theory of *structuration,* Giddens (1984), points out to the concept of structure and agency to explain human action. He argue that individuals do not simply exist nor are they bound in their rules and knowledge but produce and reproduce action in practice to bring about social change (Giddens, 1984). He therefore views the concept of practice as a link between structure and agency. Here he refers to actors as having agency in time and space (Giddens, 1984). These practices are thought to occur within a given social context (referred to as space) and within a given time (Bourdieu 1978 in Ortner, 1984). Or simply put, he refers to *structuration* by implying that "social relations are structured across space and time" (Giddens, 1984:376). Practices are then transformed, altered and generated by the influence of internal individual and social pressures as well as pressure emerging from external sources (Ortner, 1984). Taking on a structuralism approach, it emphasises that elements in human culture should be understood in relation to the whole system in which the production and reproduction of practices in the system produces meaning within this culture (Levi-Strauss & Needham, 1969). Giddens (1984) view however takes on the structuration perspective, in which he sees that repeated action of human agency leads to the creation of structure, this structure that exists within a social setting can be changed or reproduced by acts of humans, thus producing practices (Giddens, 1984).

Practice theory is not complete without mentioning the work of French sociologist Pierre Bourdieu (1977) who was among the initial philosophers in this theory. In his book "Outline of a theory of practice", he introduces the concept of '*habitus*' which tries to explain the expectations of individual agents or social groups in defined social contexts within everyday life; he relates this to "a system of dispositions" that results into practices (Bourdieu, 1977:124). He argues that individual agents produce practices in relation to social and material contexts (Bourdieu, 1977). In his concept of *habitus*, Bourdieu tries to explain how human practice and structure comes to being. He argues that this can be understood through the collective habits that groups or individuals take on in their daily life experiences or better explained as a set of dispositions within the human body, acquired through everyday living, organized through set of structure creating practices in which individuals become accustomed to (Bourdieu, 1977). Bourdieu links the concept of *habitus* to what he terms as *"doxa"*. He describes doxa as a "given" reality or constructed vision of reality, or a set of fundamental beliefs and values that derive action within a set field. *Doxa* is believed to be both objectively driven through external structures as well as subjectively driven through internalizing structures (Bourdieu, 1977). Individuals within a given field could have shared *doxa*, which in turn produces social structure, although structure does not only exist with an individual frame of mind, they can be found within social institutions (Bourdieu, 1977).

Other practice theorists such as Schatzki, (2001b), define practices as an "…array of activities in which the human body is the nexus" (2001: 2). This is to imply that these activities are organized in a certain order. Two major concepts emerge from his work that paints a different light to practice theory; 'practical understanding and intelligibility, and that practices revolve around "shared practical understandings" and they produce 'meanings' (Schatzki, 1997:284; 2001:3; Postill, 2010). Practice is also defined through 'performing an action', this in turn results into 'doings', he further suggests that by performing actions, one in essence produces practices, that practices are action in performance (Schatzki, 1997). With this in mind, he suggests that practice theory can best be understood if one looks at how practices are organized and how the action is determined (Schatzki, 1997:286).

3.1.2 Why I choose Practice Theory

In this research practice theory will be applied to understand how human action is defined in the real world through taking on the 'practice lens'. This study perceives that human action is organized through practices. By this I mean that, in order to get a better understanding of how humans function and bring about change, it is important to study human practices.

Practice theory has been used in this study to bring about the understanding of how practices emerge (Shove et al, 2012). This study therefore applies practice theory to understand how climate change adaptation practices in Kenya evolve. The study will look at practice as the 'unit of analysis'. By this I mean that the study will focus on analysing practices by applying practice theory (Behagel & Arend, 2013). This approach will require that one understand the elements that compose these practices and how the links in these elements are performed and integrated in practice (Shove et al, 2012).

Furthermore, practice theory is applied as it accurately deciphers how practices emerge, are generated and reproduced in action (Shove et al, 2012). From this perspective, the study seeks to understand actors' behaviour by understanding their practices and the context in which these practices are situated (Bevir, 2005: Arts et al, 2013). This view enables us to understand how everyday practices are generated by exploring interaction between elements, and how elements are transformed into action (Shove et al, 2012). It is important to note that the study conceptualizes actors not as agency of practice to refer to individual actors as 'carriers of practice' (Shove et al, 2012) but argues that agency is 'situated in practice' (Bevir, 2005, Behagel & Arend, 2013). By focussing on agency as situated in practice, focus will be put on the 'situation' in which practices emerge and the structures that define these 'situations' as they vary from actor to actor (Bevir, 2005, Arts et. al., 2013). Therefore the concept of situated agency seeks to understand the 'context in which a practice is situated' (Bevir, 2005, Behagel & Arend, 2013). I choose to use practice therefore as I understand that climate change practices occur in different social contexts, practice theory will be used to understand this social context and why practices within similar context vary through using the concept of situated agency.

Practice theory is further relevant to this study as it moves away from approaches put forward that seem to explain human action through a following of rules akin to institutional approaches (North, 1991). Instead, I take this approach to explain that rules are found within behaviours of actors as constituted in practices through 'routinized behaviour' (Reckwtiz, 2002: 249). This implies that they follow a set of patterns or rules which are implicitly shared among the actors; this approach does not focus on the logic that actors take to follow these patterns or routines but rather understands that the logic is conceptualized within a practice (Reckwtiz, 2002, Schatzki et al, 2001; Schatzki, 2010). This means that with practice theory, I do not focus on the motive of actors doing a certain actions but I focus on the actions they undertake - *practices* – in which the practices have a logic what is referred to as the 'logic of practice' (Bourdieu, 1990 in Arts et al, 2013). Therefore in this study, I understand climate change adaptation is not enacted through following a set of rules, but it is enacted in practices, this is why I choose to use practice theory to explain these practices.

In addition, practice theory provides insight into practices by conceptualizing human behaviour and action through practices (Shove, 2010). I therefore understand climate change adaptation as a practice that is instituted by actors within a particular setting to produce a particular outcome. Therefore, practices are not just a combination of behaviour and action but rather these behaviour and actions are coordinated by a group of actors to bring about a particular meaning. This means that the behaviour and action of actors is not only guided by their rationality but the field of practice in which they are found (Bevir, 2006). Practice theory therefore goes beyond the behaviour and action of practitioners but brings about these two into perspective through the practice lens (Corradi et al, 2010; Shove, 2010).

Finally, through applying practice theory we understand that to bring about social change one has to seek to understand practices; through this adjustments can be made (Shove et al, 2012). By understanding the elements that compose of a practice one is able to understand what adjustments (change) to bring about in the practice, by making adjustments to the elements (Shove et al, 2012). Furthermore, practice theory helps us in understanding how practices evolve are sustained or die off over time by understanding the links that connect elements of material, meaning and competence and how these links enact practices through their performance (Shove et al, 2012). Therefore to bring about change, practice theory is relevant to understand 1. elements that make up the practice, 2. how these elements link together through performance and, 3. what these links are and how practices are situated in the context that they occur.

3.1.3 How are Practices Enacted?

Practices evolve, are generated and adjusted in everyday life (Shove et al, 2012). To get a deeper understanding of practices – what people do- I base my point of departure by understanding how actors enact practices. Practices are generated by actors; these actors take the form of individual actors or social groups who are involved in the reproduction of structural features (Ortner, 1984: 149). Actors can choose to act outside the social boundaries by being referenced by the existing social boundaries, the interaction of structure and human action within a given field over time produces a new set of actions (Ortner, 1984).

In explaining what people do, Schatzki (1997) refers to the concept of practical understanding, by this he implies the "know-how to" or the how to do things. In his view, practical understanding is contextualized on a situation in which the activity is taking place. In essence he refers to practical understanding forming the boundaries of action, governed by explicit rules of carrying out an action (Schatzki, 1997). In other words, practical understanding encompasses being able to 'master the speech and action of human activity by recognizing words, symbols or pictures' (Schatzki, 1997:299). It is not only relying on practical understanding alone that one can determine action of how people act, but also understanding the role that rules and teleoaffective structures play in drawing in practices. In which teleoaffective implies the "orientations towards ends" or better put expectations in the end results (Schatzki, 1997: 300-3). Therefore the practical understanding that is seen through the performance of an action cannot just determine what people do on its own but people have to associate meaning or what is referred to as teleoaffective / mental understanding to actions (Schatzki, 1997). In other words it means that for action to take place, one need to have knowledge of 'how to' perform a certain task while following a set of explicit rules and having a goal in mind to achieve this task (Schatzki, 1997). Accoridng to Schatzki et al (2001) understandings are

not only embodied within individual actors but are shared, thus referred to as shared understandings. By shared understandings, he refers to social practices emerging through actors sharing skills and understandings, as understanding and skills vary between actors within given social settings, a social practice therefore relates to a shared understanding of a human activity (Schatzki et al, 2001).

Reckwitz (2002:249) describes a practice as 'a routinized behaviour consisting of several elements interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge'. This relationship between things and body/ mental through agents implies therefore that there is no hierarchical relationship between these two elements as such as they both form part of a practice, through production and reproduction of 'routinized' behaviour. (Reckwitz,2002). In other words, things on their own are understood to be part of the social when they relate with body/mind entities in a routine behaviour acted out by agency as the 'carrier of practice' (Reckwitz, 2002). According to Recktwitz (2002) he views the forms of knowledge as 'shared knowledge' (2002:246) which is a comprehensive way in which action is understood. Understanding and know-how are thus best understood to be found within a body which is experienced through routinized behaviour (Reckwitz, 2002). Thus the knowledge is what allows actors to make sense out of things. The term 'mental activity' is thus used to express understandings found with a body that are carried out to produce a practice.

Adler & Pouliot (2011), conceptualize practices through three key aspects that is background knowledge, discourse and the material world. These three aspects interact together. Similarly, they clearly distinguish difference between practices, behaviour and action. In which they regard actions as type of behaviour and practices as types of actions (Adler & Pouliot, 2011). This implies that, practices are 'higher' or improved versions of actions and that behaviour builds onto these actions in a logical manner. Clearly, this distinction implies that behaviour is preformed with no attached meaning to it, whereas for actions, meaning is attached to it. Therefore practices bring together actions in an organized and structured manner within a social context (Adler & Pouliot, 2011). Practices thus bring together the background knowledge and discourse in a material world, often performed through reproduction and repetition (Adler & Pouliot, 2011).

Shove (2010)'s view on social change, entails moving beyond looking at change through what she refers to the 'ABC' model (attitude, behaviour and choice) rather it moves to looking at social change from the perspective of practices. In her arguments, she views theories on behaviour and theories on practices as different. In which the former focuses on the drivers to behaviour whereas the later looks more into the dynamics surrounding social change (Shove, 2010). Therefore social action/ change is viewed by focussing on practices that encompass the social fabrics, discourse coalitions and social settings that define change. This implies that change would be effective when it interacts with social fabrics as opposed to directly dealing with change beyond attitude, behaviour and choice (Shove, 2010). It is therefore quite clear that Shove regards behaviour theories of change and practice theories as different (Shove, 2010). Difference between practices and behaviour is the different elements that practice brings about such as discourse and material settings these include language, communication and discourse (Shove, 2010). In essence, this implies that practices can be shared among social settings such as common interest groups and institutions and these practices

would exist beyond the individuals found in these groups (Behagel & Arend, 2013). Similarly, Shove et al, (2012) describes practices the integration of elements of material, meaning and competence. These elements are linked through the doings thus the performance of the practice. It is through this links that practices are enacted. Therefore, Shove et al, (2012) argue that practices are enacted when the links between elements are sustained and this happens when a practice is performed (Shove et al, 2012). Furthermore, practices are also enacted based on the context in which they occur (Bevir, 2005). Therefore, one can sum up that practices are enacted in the context they occur and these practices compose of active integration of elements of material, meaning and competence that are sustained through actions (performance).

3.2 Applying Practice theory in Forest and Nature Conservation

The practice theory has also been applied in the study of forest governance (Arts et al, 2013). By taking on this approach, one is able to study practices through not only looking at 'what people do' but in also understanding 'why people do what they do' as in the logic of the practice (Arts et al, 2013). Practice theory hence becomes a useful tool to use to decipher these practices. Practice theory can also be used to understand how practices are 'performed' through language, in this case, one can also study practices by what is being said, it is through these 'sayings' and the actions that follow thereby the 'doings' that practices emerge (Arts et al, 2013). Forest governance studies therefore places importance on understanding how human react to their environment through what they do and what they say within the social systems, structures and rules that they are located (Arts et al, 2013). In essence practice theory becomes important in forest governance by looking beyond the actors and the structures in which these actors are found (Giddens, 1984) to more of looking at production and reproduction of action through how actors and structures interact (Arts et al, 2013). The practice theory removes the focus from the individual actor, institution or rules and focus is draw to 'the *field of practice'*, this field of practice hence becomes the situation in which practices emerge and are reproduced (Arts et al, 2013:9). The practice perspective becomes relevant in forest and nature governance in the sense that, instead of creating institutions and rules to deal with social problems, the practice approach views the institutions, rules and the 'problems' as a broader aspect of the practice (Arts et al, 2013: 244). By so doing, this approach builds on the 'ineffectiveness' of other approaches such as that of 'introducing an institution for a particular problem' or that of "adapting rules that suit practical experiences" (Arts et al, 2013: 244-5).

Arts et al, (2013) understands practices as "an ensemble of doings, sayings and things in a specific field of activity" This incorporates not only agency and structure but also those of rules, knowledge and discourse (Arts et al, 2013:9-10). In studying practices in forest governance, Arts et al, (2013) incorporates three sensitizing concepts to explain practices in the field of forest governance. These concepts include the logic of practice, situated agency and performativity (Arts et al, 2013: 10). In his arguments, he states that logic of practice implies that practitioners use, follow or may follow some logic in bringing out their actions; this implies that human action is not haphazard (Arts et al, 2013). He argues that 'a logic of practice is not confirmed in institutional boundaries but in a *field of practice* that is formed over time and space' (Arts et al, 2013:10). This is to mean that human action is not defined or confined in rules and systems but it is logically brought out in specific situations. Consequently, this means, to change social action, focus should not lie in changing the rules or

structures but understanding the logic in the action. The concept of situated agency shifts focus from individual and looks at the context in which practices are found (Arts et al, 2013:11). By examining practices from this angle, practices can thus be studied in their social setting through institutions or organizations. Actors and their actions hence fit into each other and are defined by rules and discourse within these settings (Arts et al, 2013). In situated agency, the actor's behaviour is not linearly defined by rules or institutions but is defined by the situations in which these practices are found. This is to imply that the practice defer as per the situations in which the actors are found (Arts et al, 2013). This can imply, to understand practices carried out by actors in an organization one need to understand the rules and discourse in these organizations; hence focus is more on understanding the context within which these practices emerge. Finally the concept of performativity is taken to imply that practices are produced and reproduced through how agency interacts and interprets knowledge and discourse and through this brings out the relationship between practice and power, thus by performing a practice, one exercises power (Arts et al, 2013).

The above discussion shows how practice theory has been applied in forest and nature conservation studies. This places focus to practices as the unit of analysis and understanding how the collection of these practices. The concept of situated agency will be applied later on in this study.

3.3 Practice: Material, Competence and Meaning

Based on how several authors have addressed practice, I choose to understand practices by focussing on the work of Shove et al, (2012) that describes practices as composed of elements of materials, competence and meaning that are linked and performed to produce practices. I base my arguments of using this perspective as it best suits the context of this study that is climate change adaptation practices in Kenya. I focus on Shove et al (2012) as they attempt to fill the gap in social theories by incorporating material elements or things to the discussion of social theories (Shove et al, 2012: 9) and clearly showing how these practices emerge when links between elements (material, meaning and competence) are created through doings or their performance'(Shove et al, 2012: 14-5).

It is in this regard that I draw on the view that 'social practices consist of elements that are integrated when practices are enacted' (Shove et al, 2012:21) and thus defined by 'the interdependence relations between materials, competences and meanings'. This view emphasizes how these elements depend on each other, in an 'active' manner (Shove et al, 2012: 24). Further these elements are linked together through their performance (Shove et al, 2012) and that these elements are situated in practice (Bevir, 2005). I will draw on the concept of performance to define how elements of material, meaning and competence are linked together through doings of the practice. Further the performance of the practice is represented in the active doings or performance of a practice. It is the understanding that by acting, doing or performing, a practice is enacted (Shove et al, 2012). I will also focus on the concept of situated agency to explain how these practices are defined in different settings and how actors themselves produce practices in these settings. I will do this by describing the concept of situated agency (Bevir, 2005; Arts et al, 2013) and how it applies in this research. Situated agency is used in this study to shift focus from looking at agency as autonomous but rather as situated in practice, thereby taking into account the social fabrics in which agency is located (Bevir,

2005; Arts et al, 2013). The next section theoretically describes these concepts. (NB. Operationalization of these concepts will be discussed in section 3.6 below.)

3.3.1 Practice: Material

According to Shove et al (2012) material elements consist of "things, technologies, tangible physical entities and the stuff of which objects are made" (Shove et al, 2012:14). The arrangement and integration of material elements with the other elements produce practices. This means that material elements are laid out in particular ways from which other elements such as competence and meaning can be integrated within this arrange to evolve into practices. Material elements have a set of characteristics and properties that explain how these elements constitute the social. The availability of these material resources define the choices available to actors to shape their action and routines (Shove et al, 2007). In other words, the social does not exist without material entities which are interconnected through relationships, thus material entities bring out the social phenomena. Human and material agency is therefore intertwined in practice, where one cannot be thought of without the other (Pickering, 1995).

Shove et al (2012) take on the approach that social theories have in some way not fully put emphasis to address material entities to constitute the social. To understand this, she takes on the approach of explaining how material entities are linked with other elements to perform a practice. It is in this regard that they argue that elements taken individually do not constitute as practices, but rather, this happens when they are actively interlinked together, in essence this implies that, material entities take into consideration competence and meaning to produce a practice (Shove et al, 2012).

3.3.2 Practice: Competence

Competence according to Shove et al (2012) is explained through 'skills, know-how and technique' (Shove et al, 2012:14). Shove et al, (2012) notes that competences are not static, they change over time and space. They are transferred among actors through their interaction while performing certain practices. This is often seen as a result of how actors incorporate knowledge and consequently develop new skills while incorporating elements of material and meaning that practices are produced (Shove et al, 2012).

3.3.3 Practice: Meaning

Meaning has been used by Shove et al (2012) to imply that it orders and organizes a practice (Shove et al, 2012), this means that it is viewed in the aspect of the time a practice is performed and the context - space that it is performed (Shove et al, 2012). This simply means that the same practice can have different meanings within a variation of time and space, take for example the practice of driving a car in the developed world, in the early 60's which was associated with prestige and wealth, while the same practice in the present time could imply a necessity as opposed to reference on social status activity (Shove et al, 2012:26-9). Shove et al (2012) describes meaning to include 'symbolic meanings, ideas and aspirations' (Shove et al, 2012:14) where this refers to the "symbolic significance of participation" (2012: 23) to mean the relevance of the activity that actors associate with (Shove et al, 2012). Meaning is attributed from the material and competence that an actor attaches to a practice, meaning is also known to change over time and space through the application of different tools in performing a practice (Shove et. al., 2012). Therefore a practice becomes

complete not only by the actors using the required materials and competence but by the actors attaching meaning to it (Shove et al, 2012). To sum this up, these three elements (material, meaning and competence) are integrated and enacted to form a practice. This is to mean that these elements taken separately mean nothing unless they are integrated and linked to enact a practice. This integration is represented in figure 2 below.

3.4 Practice: Performance

This concept is applied to draw in the connection among the elements that make up a practice (Shove et al, 2012). Practices are enacted when elements are connected, these elements are connected through the performance of the practice, in this way the links between these elements are sustained (Shove et al, 2012). This means that if the links between the elements die off, practices die (Shove et al, 2012). In discussing how elements are linked, Shove et al (2012) discussed practice-as-performance. Through this, elements are linked through 'doings' (Shove et al, 2012). Thus elements are shaped through this active process of integration that occurs within a given time and space, causing the interdependence of elements (Shove et al, 2012). Performance over time and space is constituted in the action or the doings over time and in a given location, which produces knowledge or understandings. Doings are represented through action and action is represented through this knowledge or understanding. This knowledge is not the knowledge of know-how or skills rather it is 'the knowing of evaluating a performance' (Shove et al, 2012:23). In other words, performance creates links between elements that can be sustained over time through 'doings', these doings are repeated and reproduced over time and space (Shove et al, 2012). The repetition and reproduction of 'doings' over time and space brings about 'knowing' (in this case by knowing I do not imply having technical knowledge or having skills, rather I imply that, one is able to evaluate his doings or in other words one is able to evaluate the performance of the activity – how well you performed the activity or in other words understandings) (Shove et al, 2012) thus to evaluate the performance of an activity one needs to have an understanding of the activity.
To better understand how this concept is applied in this study, figure 2 below shows a graphical representation of the performance integrated with material, meaning and competence.

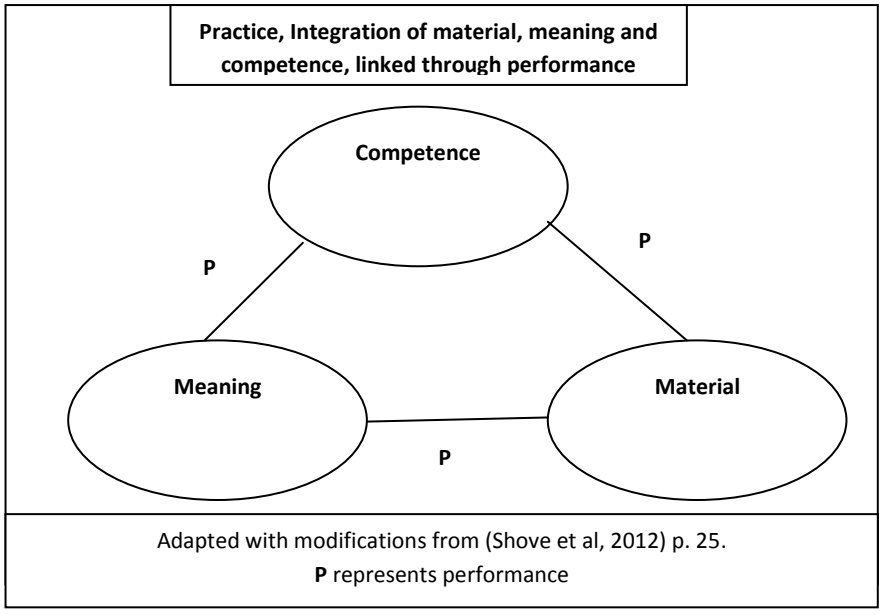


Figure 2: Graphical representation of practices as an integration of elements

The figure above shows how the elements of competence, material and meaning are actively integrated and linked through performance (doings) to enact a practice. The lines connecting the elements represents this active link between elements and that elements depend on each other thus they do not function on their own. The elements are linked together through the performance of a practice or in other words by doings. NB: The lines in this figure have no connection with cause-effect relationships but are used to represent active links of the three elements. Additionally, no hierarchical order is represented in this diagram and elements can be drawn in different positions. I now focus on the concept, performance and situated agency.

3.5 Practice: Situated Agency

This concept attributes to the fact that practices are situated in the context in which they occur (Bevir, 2005; Bevir & Rhodes, 2006). This is means that different practitioners when situated in different social settings produce different practices (Arts et al, 2013). I choose to use the concept of situated agency as an attempt to move away from ascribing agency to individual and hence as 'carriers of practice' as has been attributed by Reckwitz (2002), but instead in ascribing agency as 'situated in practice' (Bevir, 2005; Bevir & Rhodes, 2006). I incorporate this concept with material, competence and meaning to get a better understanding of the 'field of practice' in which these elements occur. Furthermore, Shove et al (2012) has focussed on the production of practice through the integration of elements as the main topic, this means that although the aspect of agency was not completely ignored in this approach, (through a brief discussion on carriers-of-practice), her main focus was to highlight the production, reproduction and transformation of practices (Shove et al, 2012: 125-6). Incorporating the concept of situated agency, contributes to this approach by shading more light to the 'carrier of practice' that is briefly described by Shove et al (2012). Therefore because of this weakness in Shove et al (2012) I incorporate situated agency through Bevir, (2005) to strengthen this framework.

The concept on situated agency has been used by Bevir & Rhodes (2003) in governance and organizational studies. It brings in the ideas that 'actor's ideas, identities and behaviour are shaped in the context of the social practices in which they are situated' (Arts et al, 2013:10-1; Bevir, 2005). It tries to describe how actors act by looking closely in the social context of background in which they perform their practices. Situated agency has thus been described to explain this by understanding the background in which actors are found (Bevir, 2005). Understanding this background also involves understanding social aspects like networks, discursive aspects such as language and material aspects such as nature or artefacts (Arts et al, 2013: 11). By applying this concept, I choose to move away from understanding behaviour through rationality or autonomous reasoning to more on context specific based on the settings in which actions occur (Bevir & Rhodes, 2006; Bevir, 2004). This '*situatedness*' would affect the actions that actors would take (Bevir & Rhodes 2006; Arts et. al., 2013). This context can therefore be interpreted as social setting to include traditions and rules; the discursive setting to include language and discourse and the material setting to include bodies, nature and artefacts (Arts et al, 2013:11). Agents are therefore not autonomous but 'situated' implies that agents are governed by the traditions and beliefs that they hold which are found within the settings in which they are situated (Bevir & Rhodes 2003). This means, 'agents can reason and act in

'a novel' way but can do so in the context of the discourse or tradition' that they are situated (Bevir & Rhodes, 2006).

These traditions could therefore be combinations of ideas and discourse that are found within a certain setting (Bevir & Rhodes, 2003) say for example; an organization holds certain ideas and discourse, hence agents within these organizations act in a certain way based on how they interpret these traditions. Therefore people perform a certain practice because they associate themselves with certain traditions when found within a given social context (Bevir & Rhodes, 2003). This implies it is important to understand the traditions found within social settings to understand how agents act within these settings. These tradition are not static, they evolve with time and are interpreted differently by different agents. Individuals acting in this manner therefore reason on what beliefs to adopt basing on their understanding or know-how (Bevir & Rhodes, 2006). These individuals may therefore adopt, adjust or reject traditions, beliefs and discourse and or interpret them in their own understanding, by so doing, this changes the social background, therefore causing people to act in a particular manner thus influence or producing new practices (Bevir & Rhodes, 2006).

In light of the above arguments, I operationalize the concepts of material, meaning, competence and performance through following Shove et al, (2012) in addition I operationalize the concept of situated agency by following Bevir, (2005) in the context of the research questions of this study. The conceptual framework below describes this in more details.

3.6 Conceptual Framework

Practice theory will be applied in this research by investigating how elements of material, meaning and competence are integrated and linked to enact practices. Further to understand the social context in which practices are situated in Kenya. To focus on climate change adaptation practices, the study will search for activities undertaken to help communities cope with impacts of climate change. Climate information will be applied in this research by searching how practitioners integrate different forms of climate information in their practices. These forms of climate information could encompass seasonality data, climate change scenarios, indigenous and local climate knowledge, and historical observed climate data. Therefore taking the perspective of Shove et al (2012) climate information relates to the three elements as follows, through materials, climate information makes use of material elements such as scientific technology in the case of GCM (Global circulation models) or local technology in the form of local weather predictions by local weather men, to understand this information one need to develop the acquired competence this could be in form of technical training such as on downscaling GCM model, or acquired skills in predicting weather such as the skills passed on from father to son, these skills could be in form of observation of animal or plants behaviour, observation of weather patterns among others. All these elements taken together are aimed at producing certain meaning, that of predicting future climate or preparation for a drought, this meaning comes about through the association of the elements incorporated. In this sense, climate information in whatever form that is applied i.e. through climate scenarios, historical climate data or indigenous and local knowledge requires the incorporation of the three elements of material, meaning and competence to be integrated through their performance and applied into adaptation practices.

In light of the objective of this study, this study operationalizes a practice as the integration of elements of 'material, meaning and competence' that are linked together through their performance and that these elements are situated in practice. For elements I mean material, meaning and competence. In other words, by material elements I imply studying objects, things, physical and bio-physical entities that make up the practice of climate change adaptation. Taken practically in the context of this study, this includes material elements such as technologies, animals, humans, financial resources, nature etc. Likewise competence in this study is taken to mean technical knowledge and skills, this includes the know-how, practical knowledge, understanding while meaning is taken to mean symbolic importance, goals and motives, this includes motivational knowledge and goals.

The concept of performance in this study is taken to mean the 'active doings of a practice' that occur in time and space and are evaluated through understandings; these understandings are represented through sharing of information and experiences and best practices in a given social setting. This means to evaluate the performance of a practice, one need to have the knowing or the understanding of carrying out the practice or assessing if the practice was carried out. This knowing or understanding is represented through sharing of information and experiences and best practices in time and space; this means that practices are performed over time and in a given location. This is done through social interactions such as community forums, networks and meetings.

The concept of situated agency is in this study was taken to mean the social context including traditions, rules, networks and nature.

To represent these concepts in a graphical image, I visualize climate change adaptation practices as a large 'puzzle' that is put together by community practitioners. Elements of material, meaning and competence each represent a piece of the puzzle. These puzzle pieces (elements) are then connected to one another through performance of a practice. All the puzzle pieces (elements) occur in a given social context. Practitioners incorporate different forms of climate information depending on the material, meaning and competence that these practitioners relate with, to incorporate into their adaptation practices. Therefore climate information relates to adaptation because it is part of the practice of climate change adaptation, as practitioners incorporate the elements of material, meaning and competence. The following graphical representation explains this further (see figure 3 below).

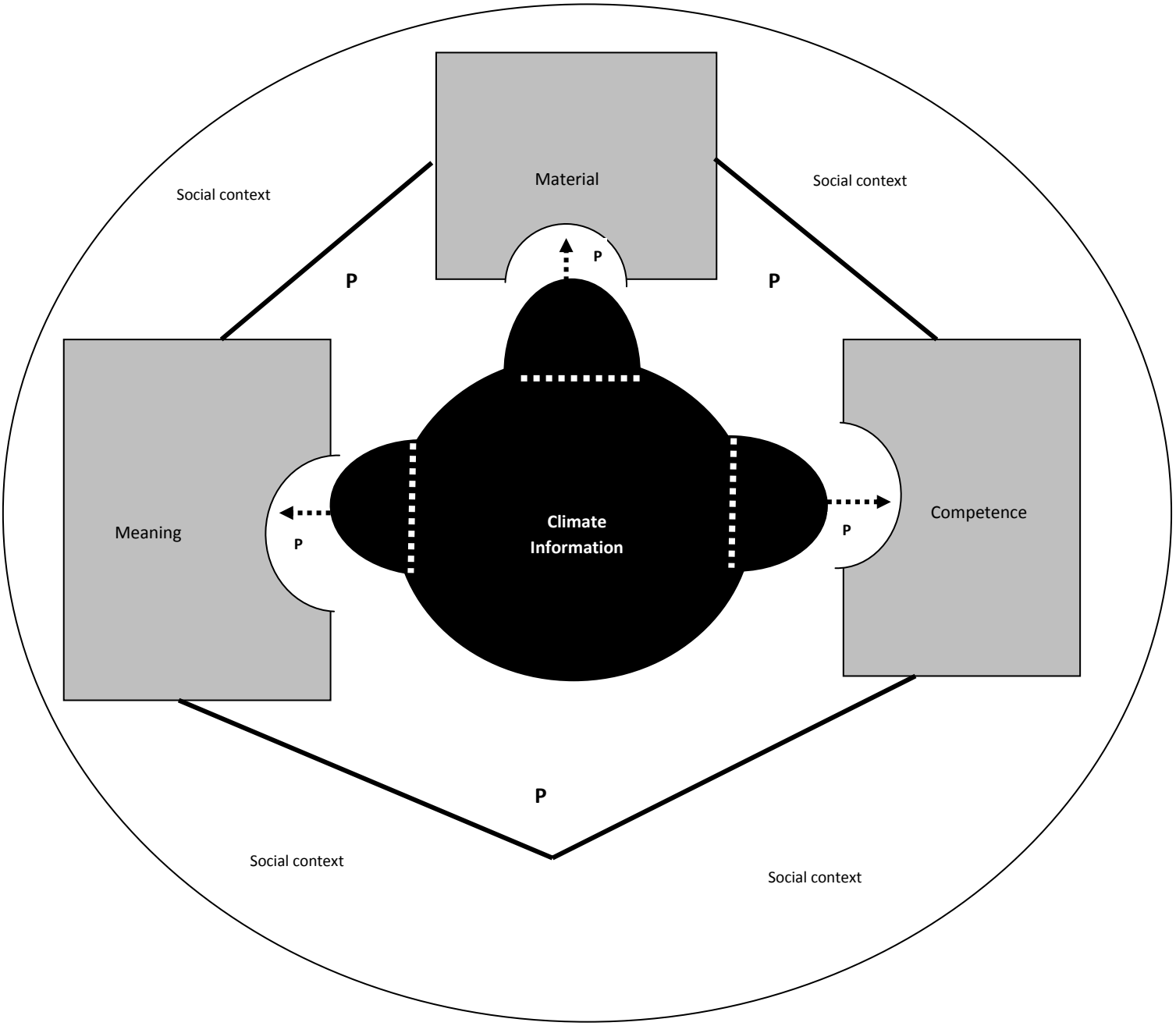


Figure 3: Graphical representation of climate change adaptation practices in Kenya

Figure 3 above shows how climate change adaptation practices are represented in Kenya. The bigger outer circles represent the social context in which these adaptation practices are situated. The concept of situated agency is used to represent the social context in which these practices are situated. Elements of practice are represented as square-like objects in this figure. These elements include material, meaning and competence; they take this shape to represent the 'piece of the puzzle' that is filled by incorporating climate information. These elements are linked to one other through the black bold lines representing the performance that enacts the practice. The letter P in this figure represents this active link through performance of the practice in time and space. Climate information is drawn in the centre to incorporate it as the practice of climate change adaptation, in the sense that it (climate information) is also made up of elements of material, meaning and competence (represented by the small circular-like shapes) that are incorporated into the elements of material, meaning and competence (the big square-like shape) through performance of the practice. The dotted white line within climate information represents that a part of the climate information is incorporated in the different elements. Climate information is integrated into the practice elements through performance of the practice. The black dotted arrows represent where climate information is integrated. NB the arrow does not in any way refer to cause-effect relationships.

Therefore to relate with my research questions:

1: What elements constitute climate change adaptation practices in Kenya and how are they integrated and linked? This question will be answered by drawing on the concept of material, represented in objects, things, physical and bio-physical entities, concept of meaning represented in symbolic importance, goals and motives and concept of competence represented in technical knowledge and skills, to explain the elements that make up a practice and the concept of performance to explain how these elements link together through doings or performance of a practice.

2: In what social context are climate change adaptation practices in Kenya situated? I will use the concept of situated agency represented in traditions, rules, networks and nature, to describe the social context in which these practices are situated.

3: How is climate information performed in adaptation practices in Kenya? I will use the concept of performance represented through understandings represented in a social setting through sharing of information, experience and best practices through social interactions, to explain how climate information is integrated into these elements

4. METHODOLOGY

4.1 Character of Thesis

The study applied the practice theory to understand the context in which elements of material, meaning and competence are integrated to climate change adaptation practices and how these elements are linked through their performance and to what extent is climate information performed in the adaptation practices. The study made use of the concepts of material, meaning and competence, performance and situated agency. These concepts were best explored by the use of a qualitative research design; the nature of this research design is to understand the quality of phenomena and processes designed around descriptions to present concrete details and understanding of practices (Denzin & Lincoln, 2005).

Through using qualitative research design, the study was able to get an in-depth understanding of climate change adaptation practices of select practitioners in Kenya. By employing methods in qualitative design, participatory observations and in-depth interviews, a deeper understanding of practices was made clear through use of thick descriptions as described by Hammersley & Atkinson (2007). The study made use of a descriptive study design taking the form of a case study approach in which three organization were selected as case studies in order to get a better understanding of climate adaptation practices, this was a trade-off between "depth and breadth" as described by Hammersley & Atkinson (2007). The use of case studies is in support of the methodological guidelines provided by Arts et al (2013) when applying practice theory to get a full understanding of practices, actors and the events surrounding practices. (Arts et al, 2013).

4.2 Data Collection Sources

This study uses both primary and secondary data. It considered secondary data which is data from previous studies through an extensive literature review. This review consisted of data on climate change adaptation practices in general and this was further narrowed down to adaptation practices in Kenya. Furthermore, data was gathered on community practitioners in Kenya with a focus on local NGOs, local Civil Society Organizations (CSOs) and Research Institutions. This study chooses to define 'local' NGOs and CSOs as non-governmental organizations, non-state, not for profit organization who have a focus in Kenya and work directly with the community. The study focussed on local NGOs and CSOs while making use of data from key informants such as Research Institutions such as the Kenya Agricultural Research Institute (who from time to time partner with NGOs through field extension services) to put the study into a holistic context.

Primary data sources included direct contact with local community practitioners in Kenya. As the study took on a case study approach, purposive sampling was used as the main sources of selecting the three samples. Through this method, the study selected only the local organizations that implement climate change adaptation projects and directly work with communities (by working directly with communities I mean organizations that directly implement on-the-ground projects). Snow-ball sampling was used to support purposive sampling. This was done at the field level, this is because some of the organizations that were selected through purposive sampling did not have an

active climate change project on the ground or in some cases they declined to take part in the research). In order to make up for this, I combined purposive sampling and snow-ball sampling, for the organizations I had prior selected before going to the field, I used purposive sampling, from these organizations I was able to get referrals of other organizations working on similar climate change related issues. This is where snow ball sampling was applied. The combination of the two methods, that is, purposive sampling and snowball sampling, resulted in twelve key informant organizations selected that actually took part in the study. The organizations that took part in the research were selected based on a certain criteria that will be explained in section 4-4.

Primary data was collected through participatory observation (for the three case studies), informal interviews/ in-depth interviews and content analysis of documents from the selected case study organizations. These documents included project proposals, project reports, publications (newsletters), newspaper articles highlighting aspects of the projects and the organization's web-pages. Secondary data was used to contextualize the study. An extensive literature review was carried out both prior and after the field work. The literature review explored the extent to which climate information has been applied in adaptation work within Kenya, Africa and globally.

Focus was directed to local organizations that have their headquarters in Nairobi for easy access of the organizations. NB. These organizations were stationed in Nairobi, but also have field offices (for some) and field sites/ projects sites in different part of the country. In other words, these organizations were based in Nairobi, although they run projects in different parts of the country, but the project officers are stationed at the headquarters in Nairobi and they have frequent visit to the project site for the implementation of the activities. Due to the limitation of time and resources, it was not feasible to sample organizations that were based out of Nairobi (i.e. their headquarters are based out of Nairobi) or are widely distributed out of Nairobi, however one field visit was made to Embu (a town located 120km northwest of Nairobi), (www.nationsonline.org) while carrying out participatory observation in one of the case study organization (KCCWG) based in Nairobi.

4.3 Data Collection Techniques

The main techniques used were participant observation (during the case study only) and in-depth interviews. Other techniques used to support of the main techniques included; informal interviews and content and document analysis.

A case study approach limited the selection of the cases to three local organizations; this was done to enable the study get an understanding of climate adaptation practices while recognizing the limitation on time and resources to explore other organizations. Three organizations were selected because they all had different climate change adaptation approach and different projects. This was thought to add more 'flavour' to the practices and present a variation of practices and approaches. The selection criterion of the case study is explained in the next section below. Participant observation, informal interviews and document analysis were the main techniques used to gather data from the three case study organizations. To further understand the extent to which climate information was applied, the study made use of in-depth interviews with key informant organizations. These key informants included; other NGOs and CSOs, research institutions and government departments.

Participatory observations were conducted in the three selected organizations in which a "practice framework" was used. Through the use of this framework, I participated in activities carried out in the organization, held informal discussions over tea/lunch, attended planning/implementation meetings, held informal interviews and accompanied project officers to the field during implementation of activities. The informal interviews were carried out with personnel responsible for the climate projects or the subsequent programme managers and directors. The informal interviews and discussions were held with different people at different times or together (it depended on the situation at hand; in essence it was conducted to be as natural as possible). As the various organizations vary in their structure and personnel, these discussions were held with different people, this variation is taken into consideration in the reflection. These informal interviews were guided by aspects from the conceptual framework. The essence of using this approach was to understand the organization's climate adaptation practices, the context in which the practices occur and the extent to which these practices apply climate information. This required that one really understands the "doings and sayings" and how these organizations run their climate activities. To fit into the work-system of the organizations, I designed my research to spend one week with one organization (a reflection on this duration is provided in the next section). During this time, informal interviews were conducted, participatory observations and review of proposal/ plans or strategies that directly related to with climate change adaptation projects.

The in-depth interviews were used to get a better understanding of climate change adaptation practices. In-depth interviews presented detailed information on the description of processes and phenomena (Hammersley & Atkinson, 2007). In-depth interviews were carried out to the key informants and the case study organizations. The main focus of the interviews was to understand the extent to which climate information is applied, what elements practitioners use to generate adaptation practices and how these elements link together through performing the practice. In-depth interviews were an important source of information to get descriptions of these processes. The interview questions were formulated in order to allow for open-ended answers to various themes as guided by the conceptual framework. The length of the interviews was considered and the interviews were scheduled to run for about 30 minutes to at most 60minutes. The in-depth interviews made use of an interview guide. The questions in the interview guide were guided by the conceptual framework and reflected the research questions. The first section had general introduction questions about the respondent, the position, the organizations' mandate and approach. The second section had questions on the projects and activities the organization has been carrying out. This was further shifted to focus on projects and activities that are specifically related to climate change and adaptation projects. Finally the third part of this guide consisted of questions to find out how these activities relate with the climate situation and climate information and what form of climate information was applied (See appendix).

In both techniques, participants and informants were made aware of the nature of the research. In some cases (majority), the interviews were tape recorded; this was done only after the respondents agreed to it. Respondents were also informed on the possibility of the data being published through the university, and agreed to this. Ethical considerations were taken into account when conducting the interviews, privacy and confidentiality of the interviewee was taken into consideration especially where the respondents are not comfortable with being quoted.

4.4 Selection of the Sample – Community Practitioners

The organizations were selected prior to going to the field. (Although as explained about, some organizations declined to take part in the research and hence snow-ball sampling was used, the specific number will be explained below). This took place between 1st July and 23rd August 2013. It was done through an extensive review of organizations working on climate change issues in Kenya. The review involved searching through the internet; reviewing selected publication and contacting local organizations (that were known to me) in Kenya.

This approach led to the listing of one hundred forty Seven (147) organizations in Kenya who claimed to be involved in work pertaining to climate change. From the list of one hundred forty Seven (147), the following steps were taken to arrive at the selected sample. First, organizations that were located out of Nairobi were eliminated due to limited time and resources for data collection. Upon this first elimination stage, the eighty one (81) organizations that remained, I used purposive sampling and applied a set criteria (explained below) to select the sample size for research guided by information gathered through review of publications and reports on these organizations as well as the objective of the study.

The following criteria guided the selection of the organizations:

- Climate change programme: Organizations that run a climate change project or programme or a strong component of climate change work in an existing project. This will be important in order to understand the organization's appreciation of climate change and the practices they employ and how they are shaped and carried out.

- Existence of the organization: The study considered working with organizations that were in existence for a 'long period of time' this period was determined by the momentum of climate change activism in Kenya. In this regard, organizations selected for the case study were considered if they were in existence at least before the year 2006 and had climate-related projects from this time. This particular period was selected as it marked an accumulation of climate change activism in Kenya after Nairobi hosted the 12th Conference of Parties of the UNFCCC, it is around this period that climate change issues were given major consideration by government, civil society and other activist (GoK, 2013). This period also marked the actively use of the term climate change in major projects and programmes in Kenya. Based on this, an assumption is made that organizations were more informed and aware on issues of climate change and actively carried out climate adaptation activities at this time-frame.

- Finally, the study focussed on climate change adaptation practices, and in so doing, it considered organizations that are in some way directly involved with community groups either through awareness and advocacy projects or in on-the-ground adaptation work. This criteria is used in order to get a better understanding of what organizations really do based on what they say.

Based on the above listed criteria, the list of eighty one (81) organizations was further narrowed to fifteen (15) organizations through purposive sampling; these include local NGOs, research institutes and government departments. Out of the fifteen (15) organizations selected only nine (9) were accessible and agreed to take part in the research, the remaining six (6) were either not accessible (phone, email, declined visits), or did not respond and did not agree to take part in the research. These six (6) organizations were later replaced through snow-ball sampling by eleven (11) other organizations who agreed to take part in the research and were interviewed. This brought the total organizations that took part in the research to twenty (20) organizations.

Out of these twenty (20) organizations, three (3) were selected through purposive sampling as case study organizations. The three (3) organizations selected as case-study samples, were selected based on the accessibility and willingness to participate in participatory observations and willingness to host the researcher during this period. The three organizations selected to participate in the case study carried out varying climate-related activities, this included advocacy, capacity building and information dissemination. These organizations also incorporated climate change activities in most of the projects and programmes and worked directly with different community groups including pastoralist communities, farmers and fisher folk.

The remaining seventeen (17) organizations took part in the research through in-depth interviews. Out of these seventeen (17) organizations, four (4) organizations did not have any climate change related project or activity going on despite the fact they 'claimed' to take part in climate related work (through websites). This brought down the number of relevant interviews to thirteen (13) organizations. Out of these thirteen 13 organizations, one (1) declined to have the interviewed used in any part of the research, hence this data was not used. This left only twelve (12) organizations, of which their data was included in the research findings. The table below gives a brief description of the organizations selected for this study.

Table 1: Description of organizations selected for the case study.

No	Name of organization	Focus area in relation to climate change
1	Arid Lands Information Network – ALIN	ALIN works with local partners to improve access to good quality information and knowledge on climate change adaptation practices using publications and web 2.0 tools. It empowers community with information and helps them respond to climate change. http://www.alin.or.ke/Climate%20Change
2	Kenya Climate Change Working Group – KCCWG	KCCWG is an umbrella network of civil society organizations in Kenya that work on climate related issues. It also runs projects on climate awareness, advocacy and empowering local communities on coordinating responses to climate change. KCCWG has been in the frontline in advocating for the Climate Change Bill in Kenya. www.kccwg.org
3	Environmental Liaison Centre International – ELCI	ELCI works with civil society groups in Kenya to strengthen environmental governance and sustainable development issues. It runs a climate change adaptation programme with a focus on assisting communities adapt their livelihoods to impacts of climate change. It also mainstreams climate change issues in all its current projectswww.elci.org NB: ELCI is a member of KCCWG on paper but does not take part in their activities

In selecting samples for the key informants, purposive sampling was first undertaken. This sampling aimed at identifying organizations that fit into the criteria and purpose of the research. While in the field, some organizations could not be reached or declined to participate in the researcher. To make up for this, snow-ball sampling was used. Organizations that had agreed to take part in the research (through interviews) were asked to refer other organizations working on climate change issues, this formed the basis of the snow-ball sample. The nominated organizations were then contacted and an appointment for an interview was set. The table below describes organizations that were selected to participate as key informant organizations through in-depth interviews.

Table 2: Description of activities undertaken by the key informant organizations of the study

Name of organization	Brief description of activities
1. Nature Kenya	A society involved in the conservation of nature and biodiversity in Kenya through conducting biodiversity monitoring. It is also involved in projects on empower communities on the sustainable utilization of natural resources
2. African Centre for Technological Studies – ACTS	An independent research organization that applies science and technology in sustainable development
3. Practical Action – Kenya	Involved in enhancing practical solutions for rural communities to end poverty through use of technological solutions.
4. Christian Aid – Kenya	A development organizations that works to fight poverty through providing support to local organizations and funding and running local development projects
5. Oxfam – Kenya	A development organization that supports development projects that fight poverty and fight for climate justice in Kenya
6. Wetlands International - Kenya	Concerned with conservation and preservation of wetlands and water resources. Concerned with disaster management using the landscape approach
7. Institute of Environment and Water Management	Enhancing climate resilience through advocating for access and management of water and environmental resources.
8. African Conservation Centre	Enhancing biodiversity conservation through scientific research and supporting environment and livelihood programmes
9. Kenya Agriculture Research Institute	Supporting agricultural development through conducting of scientific research and offering technical support in agronomic practices
10. National Museum of Kenya	Supporting sustainable utilization of natural resources by conducting scientific research
11. National Environment Management Authority	National government body in charge of coordinating all environmental issues
12. . CARE Kenya	Enhancing climate justice and supporting resilience of communities to impacts of climate change and sustainable livelihoods.

4.5 Research Content

The research was conducted between 26th August 2013 and 28th October 2013 in Nairobi, Kenya. Interviews and participatory observations were mainly conducted in the head-office and in certain cases; the researcher accompanied the interviewee to the field (as in the case of KCCWG). The interviews were conducted during the normal working hours (between 8am and 5pm); informal interviews were conducted whenever an opportunity presented itself.

In the selected organizations, in-depth interviews were carried out with the officers responsible for carrying out the climate change projects and in other cases, the programme managers and directors were also be interviewed. The selected personnel were chosen as it was assumed they would be more familiar with climate change adaptation practices that they employ in their daily activities; they also hold information on climate information to apply in their daily practices. An interview guide was used as the main instrument for the in-depth interviews (see appendix).

Apart from interviews, project documents, proposal, plans or strategies related to climate change adaption work were assessed. In reviewing these documents, emphasis was put in the source of climate information, how climate information is represented, the time-scale for planning climate activities/ actions, what practices emerge from previous projects, what practices are used, how the practices are adjusted in relation to the climate information available.

A total of fifteen organizations took part in the research. These were; three for the case study and twelve as key informant organizations.

For the case study and key informant organizations, a total of thirty three (33) interviews were conducted. For only the case studies, a total of eleven (11) in-depth interviews were conducted in general, out of which three in-depth interviews were conducted with senior programme officer from ELCI, this included two project officers and the director. For KCCWG, two in-depth interviews were conducted with the two project officers. For ALIN a total of six interviews were conducted, out of which four were conducted with project officer and programme managers supporting specific projects, one was with the director and the other one was with the finance officer.

For the key informants, a total of twenty two (22) interviews were conducted, out of the twenty two interviews conducted, only sixteen (16) interviews were selected to be used in the data analysis. The other six (6) interviews were not selected because 4 (four) were not relevant, that is they did not have any active climate change project in the organization, the other two (2) declined to have the data used in the research after the interview had already taken place despite the researcher seeking approval in the beginning

To support the in-depth interviews, participant observation was carried out for the three selected case study organizations. These observations were made within a period of five days each for the three organizations. The observations were informal and took the form of participating in activities such as sitting-in in meetings and accompanying officers to the field. Informal conversation also occurred during tea break or lunch break. On average a total of one hundred and twenty (120) hours was spent on participant observation for the three organizations, each taking on about on average eight hours per day. Informal conservations were made during the participant observation period,

these conversations mainly occurred with project officers within the organizations. For ELCI, informal conversations were held with the director and project officers, these conversations were specifically targeted to understanding the activities in projects. These conversations were not taped in order to try to make them as natural as possible. One informal conversation was held with the programme officer at KCCWG on a field trip to the project implementation site (Embu). Two informal conversations were held with project officer in ALIN. In total for all case studies a total of five informal conversations were made. (This refers to the conversation that had content related to the study)

When conducting the participant observations, at the end of the day (and at times during lunch or tea break), I wrote down key points and notes in my note book, at times these notes were in form of phrases, words used or a few sentence. At the end of the week, these notes were then combined and re-written into a full story, this was done for all the three case study organizations

4.6 Data Analysis

The aim of the data analysis is to understand and make meaning of the action that is going on (Denzin & Lincolin, 2000). The data was analysed qualitatively. All interviews were typed out and transcribed. Data was edited for grammatical corrections and sorted out to make sense to the reader. This involved correcting grammatical error, spelling and translating some phrases from one language (Kiswahili) into English. The research employed coding as described by Strauss & Corbin (1990) that employed three stages in coding, that being open coding, axial coding and selective coding.

In the first stage, the sorted data was first analysed by employing open coding. This required going through the whole text and noting down impressions from the text (Strauss &Corbin, 1990). This was first done with data from the three case studies and eventually moved on to the rest of the interviews. The questioning approach was used to try to assist in identifying labels or categories, this involved reading through the text and asking questions such as, " what is going on, where is this happening, what is this a representation of, who is the audience, when did this happen, how did this action take place, why is this action described" among others. Also to get a further understanding of phenomena, analysis was also done through dwelling on key words or phrases that have been used in the data and trying to establish the meaning behind these words (Strauss & Corbin, 1990). The answers to these questions assisted in drawing out labels and categories. These categories were phrases used in the interviews as representation of processes, action, repetitions, descriptions of location and unique features. In this stage, some categories that were identified were merged with others while others were dropped, thus bringing out key categories that grouped the initial labels. These categories were defined moving from a descriptive labelling of the actions to more of analytical labelling by attempting to analyse the situation or action taking place (Strauss & Corbin, 1990). Some categories identified included information sharing, advocacy, capacity building, learning from experience, meeting community needs, donor influence, livelihood sources, developing best practice among others

The second stage involved axial coding. This stage attempted to bring out the connections between the emergent categories. This involved looking at the categories created during open coding and attempting to make sense of the categories while identifying connections (Strauss & Corbin, 1990). The categories were later grouped and aligned according to the study's research questions (Strauss &

Corbin, 1990). This stage involved analysing the data by attempting to bring out relationships within phenomena, the interventions between them and the results or consequences of these interventions (Morrow & Smith, 1995; Strauss & Corbin, 1990). Some categories generated include clashing practices, enabling environment for practices, limiting factors for practices, structures of organizations, operating models, defined niches among others.

Selective coding was the third and final stage done. This was done in order to illustrate the concepts and variables that emerged from the data and to identify the relationship between different categories. This stage resulted in making comparison between categories thus producing core categories from which analytical descriptions of the process emerge into a story (Strauss & Corbin, 1990). Some codes included: developing a practice, organizational niches, donor spheres and hindrances to practices.

It is important to note that, grounded theory approach as described by Glaser & Strauss (1967) was applied in generating categories during the coding process and these categories were not pre-conceived prior to the coding process but emerged and were discovered during data analysis process.

The data analyzed included transcribed interviews, field notes, field notes, proposal, reports and web-pages.

4.7 Reflection

4.7.1 Ethical Consideration

In carrying out any research, one should consider adhering to laid down ethic guidelines (Hammersley &Atkinson, 2007). The study took into consideration the following ethical stands:

- *Overt research*

The research was an overt research. The research participants were made aware of the nature of the research and were given a chance to either accept or deny taking part in the research. A brief outline of the research was made available to the research respondents prior to conducting the interviews or taking part in participatory observation. The methods of data collection i.e. participatory observation and interviews were made explicit to the respondents.

- *Informed consent*

The research respondents were informed about the research prior to the research taking place. Permission to carry out the study with the research respondents was made explicit and the respondents were informed of the expected outcome of the research i.e. publication. Respondents were made aware that they were free to withdraw from the research at any point they felt uncomfortable with the study. Permission was sort before recording or taking part in participatory observations.

- *Privacy and confidentiality*

The researcher upheld the highest level of privacy and confidentiality in regards to aspects of the research. The respondents' identity was protected and was considered anonymous. In support of this, while writing down the results, respondents were given codes to different them from one

another. In this case a respondent from ALIN would be noted as ALIN respondent 1 as opposed to using the work title such as ALIN Climate Change project officer. This was done to protect the privacy of the respondents

- *Consequences for future research*

The researcher conducted herself in a presentable manner, adhering to the dress code and cultural requirements of the respondents. The respondents were made aware that they could access copies of the report through the university website upon completion of the thesis.

4.7.2 Role of Researcher

The researcher plays a major role in any type of research and could influence the outcome of the research (Hammersley & Atkinson, 2007). With this in mind, I was reflective on my role as the researcher especially when conducting participatory observation sessions. I was able to reflect from time to time on my own assumptions and judgments, through making notes of the research site and situation in which I found myself in. I acted as the gatekeeper as I had personal contacts with most of the respondents, however to minimize biases and overlooking facts, I took on the reflective approach. Dress-code, research protocols was taken into account when addressing the respondents, for example, In Kenya, government officials require a high level of respect when addressing them and this often implies that they are referred to by their second name and work titles. Finally, in accordance to Wageningen University code of conduct and the respondent's organizations code of conduct, I conducted myself in a presentable and respectable manner as befits my role as a master student.

4.8 Limitation of the Study

The study acknowledges that it is limited in certain aspects such as in research time and resources. These aspects were taken into consideration when drawing out the sample and were considered at the data analysis stage. The research was conducted in a time frame of two months. During this time, the researcher spent about one week in each of the case study organizations in order to get an understanding of their adaptation practices. This time frame may be considered relatively 'short', as taking on a practice-based approach requires one to spend a 'considerable' good amount of time with the research respondents in order to understand the practices (Arts et al, 2013).

In consideration of this, the study made a few adjustments, the selection of three case studies was based on the understanding that the three organizations had different climate change projects. Furthermore, to make up for the short time available to conduct the research, the research combine participatory observations with in-depth interviews in these organizations, to add to that content from these organizations were taken into consideration, this content included, project reports, newspaper articles, publications as well as web-pages of the respective organizations. As participatory observations were at times restricted due to the organization's policies, I ensured that good- in-depth interviews were conducted and also analysed data form content mentioned above.

By taking on this approach, I consider that a trade-off of 'breath and depth' is taken into account. The researcher was not be able to study many organizations but instead concentrated on only three organizations thus getting, greater depth into adaptation practices. Similarly, by including other

content, I was able to get more content and a deeper understanding of climate change practices in these three organizations.

Further, to support more data, key informants were interviewed from other non-governmental organizations, scientists and governmental officials who work in the area of climate change or are familiar with the study topic. These interviews took on an in-depth approach and would last between 30 minutes to about 60 minutes. The in-depth interviews were used to put the adaptation practices in context of the wider research topic.

It is therefore important to realize that, based on the above limitations; the findings of this study cannot be generalized to be findings of the wider community practitioners in Kenya as this does not present a representative sample. As a matter of fact, the researcher acknowledges that the targeted community practitioners all run different climate related projects and carry out different activities in regards to climate adaptation and hence, the study expects to find variations in the practices undertaken by the various practitioners. In general, the study does not seek to find consensus in practices but seeks to provide an understanding of the various adaptation practices carried out by various practitioners in Kenya and more so, to explore if there exist any link between how climate information and the climate adaptation practices carried out.

5. FINDINGS

5.1 Introduction

In this chapter I present the main findings of this research. The findings are organized to reflect the three case studies which were the main point of focus for the study. Findings from key informants will from time to time be used to draw out similarities or contrasts with the case. This will be done in a bid to try to contextualize climate change adaptation practices in Kenya through 'thick descriptions.

The three case studies each have different climate change adaptation practise. These findings will be arranged in such a way that draws out the differences and similarities in these studies. It is important to note that the aim is not to draw on generalizations from these case studies, however this is done to present a holistic view on the types of climate change adaptation practices from these organizations.

This chapter is organized in this way; I will present findings from the three case studies that correspond to the research questions. The main aspects of the research would involve describing climate change adaptation practices in each case study organization; building on to this, I will analytically describe how practitioners draw on elements of material, meaning and competence in enacting adaptation practices. I will also highlight how practice elements link together when climate change adaptation practices are performed in these organizations. This will touch on the performance of the practices through understandings within a given setting. The social context in which these adaptation practices are situated will be discussed. To do this I will describe the social context in form of nature, traditions, rules and networks in which adaptation practices are situated and how this context has a bearing on climate adaptation practices in the three case studies. Finally I will discuss how climate information is performed in adaptation practices in the three case studies in Kenya. NB. The above description highlights in brief what the results would entail, however this does not mean the discussion will follow that order or are linearly related, but understanding that practice theory incorporates all aspects of practices together, discussing the concepts used in this research will mean that no order is used and concepts fit into one another in any fashion and does not necessarily follow a liner order where one concept is discussed before the other.

The selected case studies are not selected and presented with an aim of generalizing on practices, but rather they are selected to demonstrate individually the process that different organizations go through to develop practices and how these practices later evolve to adaptation practice. These case studies will independently clearly demonstrate the emergence of practices over time and space within different fields of practice.

5.2 Case Study 1: Introduction to Arid Lands Information Network – ALIN. An Overview

ALIN is an NGO that facilitates information and knowledge exchange between extension workers and rural communities in East Africa. It facilitates information and knowledge on small-scale sustainable agriculture, climate change and natural resources and sustainable livelihoods. The main medium of information sharing is through use of Information Communication and Technology tools (ICT). It does by linking with rural community through partnership with intermediaries such as local community based organizations, local NGOs, government field extension workers and faith-based organizations. Over the years, ALIN has focussed on supporting communities living in Arid and Semi-Arid lands (ASAL) in Kenya, however currently, It is spreading its reach to other areas no necessarily ASAL. The main working module is through the use of *Maarifa* (Knowledge) centres, which are information hubs stationed in seven field centres in Kenya. These centres are equipped with modern ICT equipment and they serve as information 'kiosks' for local community members. The centres are run by field officers who offer assistance to community members. The field station serve as an access point to information on sustainable agriculture, natural resource or climate change, as well as an information dissemination hub for this information to the wider community. [ALIN webpage, www.alin.net]

5.3 Knowledge Sharing Practices for Climate Change Adaptation in ALIN

ALIN's core business is in information and knowledge sharing aimed at supporting community members with information and knowledge to support their livelihoods. In addressing issues related to climate change adaptation, ALIN does this through focussing on information and knowledge sharing practices. Climate change adaptation is therefore addressed through sharing information to support the community to adapt to impact of climate change. This has mainly been done through three main avenues; *Maarifa* centres, OISAT platform and through publications (Baobab and Joto Africa). Over the years, ALIN has grown to further develop its niche in knowledge and information sharing, targeting sustainable livelihoods. Initially this was done through use of world-space radios services, where information on small-holder farmers was downloaded from the world-space radio. Over time these technologies have changed to include internet service offered through the *Maarifa* centres, the content of the information has also evolved over times and focussed to specific livelihood such as small-holder farmers, environment and climate change issues. Climate change adaptation in currently handled through three main areas in ALIN, these include *Maarifa* centres, OISAT platform and publications. These three practices of knowledge sharing will be discussed further in light of the objective of this study.

5.3.1 Knowledge Sharing through use of Maarifa Centres

ALIN has over the years built a niche in information dissemination and creation of knowledge especially for small-holder farmers across the country. Information dissemination involves collection the right type of information and packaging and disseminating it to the right target group. To support the climate change programme / projects, ALIN performs its knowledge sharing practices through creating awareness on the impacts of climate change to community members. It does this

through use of one of the information nodes known as the *Maarifa* centres. The *Maarifa* centres (Swahili word for Knowledge) are located in 7 different locations around the country covering most Arid and Semi-Arid regions. These centres are found in Marigat, Kyuso, Mutomo, Nguruman, Ndthiwa, Isinya and Ngarwa. All the centres are located in Arid and semi-arid lands with the exception of Ndthiwa and Ngarwa. The communities living within these locations are faced with different climate change challenges and hence the adaptation measures vary across different communities.

The *Maarifa* centres are thus tailored to provide specific information that fits into the cultures and traditions of the community members in the 7 field sites to enhance their adaptation to climate change. The type of information, content of information and form of information is therefore highly considered in relation to the specific *Maarifa* centre. The information and knowledge shared revolves around the three core pillars of the organization geared towards the goal of knowledge sharing for climate change adaptation. These pillars include; access to information, knowledge management and community empowerment. The organization thus structures its information around these three pillars. For example, to support community climate change adaptation practices through the *Maarifa* centres, ALIN has equipped the *Maarifa* centres with modern tools such as computers, internet hubs, books, and reports that contain information on adaptation practices supporting small-holder farmers and pastoralists. The centres are run by the help of qualified field staff who are equipped with the required skills and expertise to support communities to access and interpret information that supports their livelihood and enhances adaptation to climate change. As one respondent notes:

> *"We are an NGO that supports communities to exchange information that is appropriate and relevant so that they can improve on what they do, and we use a lot of ICTs, our areas of focus are mainly agriculture, access to markets and a bit of climate change information under the environmental theme, because these are factors that affect agriculture a lot"[ALIN, Respondent 5]*

By performing this practice, ALIN enacts its adaptation practices. The *Maarifa* centres not only act as information hub but also focal points where community members can inquire on farming practices, receive support from other organized groups in adopting different practices. Through the *Maarifa* centre, farmer-support groups have been formed to learn and share best practices in farming related activities. One such example is the farmer groups located near the Mutomo *Maarifa* centre. Through the support of ALIN, these groups have received information on adapting to climate change through planting of drought resistance crops. ALIN partners with government extension workers have thus partnered to provide the required information and training on the particular crops that would do well in the climate in Mutomo, further the farmers have used the *Maarifa* centre as a hub to make queries on the observations they encounter in the field.

Thus to support communities adapt to climate change, ALIN integrate elements of materials through use of physical entities such as the *Maarifa* centres which are equipped with tools and technologies such as computer, internet, books among others. This information is thus processed and packaged by the field offers who are trained in information management and community empowerment in order to present the correct information to community members. Further through

the networks that ALIN has formed with other organizations, government extension offers, they are able to make use of the information and provide training to community members on ways to plant drought resistant crops, the correct types of seeds needed among others. By engaging with elements of material and competence, ALIN is able to achieve its goal in providing information and sharing knowledge to enhance climate change adaptation. Thus through this, new meaning of climate change adaptation through knowledge sharing is formed.

Climate change adaptation practices in ALIN are thus enacted when these elements; material elements such as tools and technology, the competence elements such as the technical skills and knowledge and meaning elements through the goal of enhancing drought-resistant crop varieties. These elements are enacted to adaptation practices when they are performed through the sharing of information and best practices through farmer field schools and other social networks. ALIN often uses the *Maarifa* centres as hubs to share best practices. This means that best practices are documented and recorded and these practices are shared with other *Maarifa* centres across the country. Thus these practices are enacted when they are represented in the form of publications, videos and through exchange visits between the *Maarifa* centres.

ALIN works under the assumption that for climate change adaptation to take place, there has to be the right information to community groups to support the ways in which they are to adapt to climate change. Therefore climate change adaptation measures revolve around providing the relevant information to community groups. The *Maarifa* centres also work as a hub to collect data on the challenges that are going on in relation to climate change that farmers are facing. Through collecting this information in the *Maarifa* centre through the use of the monitoring log tools, they are able to get the specific needs that the communities are facing and thus provide information that addresses these specific needs. Through this they are able to bridge the gap in information and knowledge sharing through the *Maarifa* centre, thus the climate change adaptation practices are enhanced.

Climate change adaptation practices are thus enacted when the elements that consist of the practice are linked. For example, through the *Maarifa* centre, farmer groups in Mutomo in eastern Kenya, are able to better adapt to impacts of climate change by planting drought resistant cassava species. Through the *Maarifa* centres, farmers requested information on better ways to plant cassava that can withstand the dry climatic conditions. Through the Maarifa centres, ALIN links farmers, with researchers and agriculture extension officers through conducting field exchange visits, facilitating farmer field schools and demonstration plots to share knowledge on different farming practices that can be carried out in arid areas and that can withstand theses dry climatic conditions. For example, farmers are getting trainings and practical skills on growing drought resistant crops such as cassava in response to these harsh climatic conditions. This is done as the farmers attend the farmer-field schools and training workshops. Such activities are carried out to encourage farmers to diversify their livelihoods as a protective adaptation measure. These activities were initially just regarded as livelihood activities; however they now have a new meaning as adaptation activities as links are made to climate change adaptation through their performance through sharing of information in trainings and farmer-field schools, in this case new meaning is incorporated into the already existing practices. In this particular case, adaptation practices were enacted as farmers took up this farming practice (planting cassava) and shared it among 46 other farmers groups in the area.

"Our centres are in ASAL, we develop our activities to address the challenges the farmers are facing around climate change adaptation, we built the capacity of farmers on best practices on climate change adaptation through demonstration plots, e.g. we promote the use of cassava as an adaptive crop in dry areas such as in Mutomo, this practice has been replicated by 46 farmer groups" [ALIN, Respondent 1]

Climate change adaptation practices are situated in context of community needs, culture and livelihood activities. For example, the communities in Mutomo are found in very dry and arid areas, adaptation activities therefore involve working around these environmental conditions and taking the culture of the community into account. Community members in this region are often small-scale farmers growing subsistence crops. The adaptation activities therefore revolve around providing information for these farmers to support their farming practices and that are within their livelihoods.

"[Our Maarifa centre activities] vary depending on the information needs and also the areas we are working in. In ASAL we always respond to the information needs around the network members, [farmers] in the eastern region such as Mutomo are farming cassava, pigeon peas and green grams we support these activities. In Kajiado most of them keep livestock because of their pastoralist nature, we support then on livestock farming to improve their breeds' [ALIN, Respondent 1]

When communities share their challenges in dealing with drought and when they share their knowledge on the best practice to take to deal with climates change through the *Maarifa* centre they enact the adaptation practices. Through the sharing of best practices and practical utilizing of the knowledge from *Maarifa* centres, these activities thus have new meaning related to climate change adaptation.

As demonstrated, climate change adaptation practices have involved engagement with elements such as tools such as *Maarifa* centres and technical knowledge on climate change adaptation such as planting cassava. Thus new meaning has emerged into these practices. Material elements such as the use of world space radio, ICT materials, *Maarifa* centres were used at different times as tools to access and disseminate information related to sustainable agriculture and pastoralism. Over the years, the content of information has changed as partnership between ALIN and other organizations and networks has grown, this has seen changes from livelihood information to more defined information such as small-scale agriculture, environment and climate change impacts, thus bring new meaning to practices. These practices are situated in the community needs, community farming practices and the surround environmental conditions. The *Maarifa* centres has provided organizational structures, and formats for sharing climate knowledge, interactions with other community members, with extension offers and government department has further enacted the climate change adaptation practices. This approach has enabled ALIN to clearly define its niche in information dissemination and link its practices to the three pillars of access to information, knowledge management and community empowerment.

5.3.2 Enacting Climate Change Adaptation Practice through the OISAT Platform

Climate change adaptation is also performed through sharing knowledge and information through the OISAT platform. OISAT stands for online information service for non-chemical pest management), it is a project that was originally developed to focus on developing organic non-chemical pest management products that would be used by farmer groups to reduce on cost of purchasing the conventional pest management products. This was mainly because the target groups – small scale farmers – could not afford the expenses of purchasing conventional pesticides. The project was developed to address the negative impacts of climate change on crops through emergence of pests and diseases due to extreme and fluctuating weather conditions. Therefore to adapt to climate change, ALIN made use of its core competence in information and knowledge sharing by partnering with researchers and other organizations to collect information on organic pest management that could be initiated in the tropics. This meant that ALIN had to invest in tools and equipment that would support it to facilitate the exchange of information and knowledge on organic pest management. This involved gathering local stories from farmers from different parts of Kenya who are facing various challenges in dealing with agriculture pests and diseases and who have developed local and organic ways to deal with these challenges. The result of this resulted in information on organic pest managed shared among different farmers across Kenya through the online platform. Further, other than sharing success stories, farmers held field exchange visits with other farmers to 'teach' and train other farmers proper way to develop organic pesticides. Through this platform, about 700 farmers have accessed information through the platform and developed local organic pest management practices that would support them to combat effect of climate change.

> *"OISAT was quite successful I would say that,[...]in terms of climate change because we are talking of pests, you see when there is this extremes of weather also new pests come in and this mostly affects crops, and in most cases communities have been buying chemical pesticides to spray, and one big impact of this project is that community said even if they did not harvest anything at the end, [due to drought] at least they did not incur costs in buying pesticides to spray on the crops.." [ALIN, Respondent 1]*

Several elements have played a role to support climate change adaptation practices. As noted, ALIN has over the years developed its niche in disseminating information to rural communities on sustainable agriculture. The different area in which it has operated has enabled it to utilize various material elements such as technology in the form of world-space radios to internet and ICT tools to disseminate information. This evolution on the content and means of information dissemination has enabled the organization to develop competence and skills to information dissemination, and thus bring in new meaning to their activities. The activities are now pegged under climate change adaptation activities as opposed to isolated activities addressing just drought, thus 'changing' the meaning of the activities towards climate change adaptation activities.

Information dissemination and knowledge sharing through the OISAT platform were possible because farmers were willing to share their knowledge on pest management and farmers were also willing to adapt new technologies in pest management. This knowledge was exercised and became real through field exchanges and through a functional platform. Shifting from information available online to actual information that supports climate change adaptation practice involved active

utilization of this information, training of farmers to develop local organic pest management techniques, this involved sharing of technical and acquired skills and knowledge among farmer groups.

The need to address emergence of crop pests and diseases and use of organic pesticides led to the development of the OISAT platform. It is in this context that the adaptation information shared revolved around use of organic pest management. These practices were also situated in the social network groups that the farmer groups had developed through this platform as a means to share this knowledge to combat with climate change. The link between organic pest management and climate change was created through ALIN organizing trainings for the farmers in which farmers were able to learn about impacts of climate change on their farms. This link also emerged as the platform was created and farmers were able to share their best practices and approaches with other farmers thus learning from each other. Creating this link thus enacted climate change adaptation practices through use of the OISAT platform to share adaptation best practices and lessons from other farmers. Thus this practice was situated in the context of framers exchanging knowledge and sharing experience with one other as a measure to manage pests on their farms and within ALIN's organizational approaches that provides an online platform to share and exchange this known.

5.3.3 Enacting Climate Change Adaptation Practices through Publications

ALIN also used the avenue of publication to enact climate change adaptation practices. It believes that for adaptation to take place, knowledge has to be available and shared among practitioners. To do this, it documents best practices from its Maarifa centres in Kenya and through findings from other organizations in Africa. Publication of climate change adaptation practice is therefore done through the *Baobab* magazine and the *Joto Africa* magazine. The *Joto Africa* (Swahili for 'Heat in Africa'), magazine, is a one of ALIN's weekly publication with over 8,000 subscribers in Sub-Sahara Africa designed to specifically communicate on issues related to climate change adaptation in Sub-Sahara Africa. The magazine focuses on short peer reviewed practical case studies, interventions and relevant information in a step-wise approach to share the approaches communities are taking to adapt to climate change. The magazine aims at addressing policy interventions as well giving practical cases on adaptation interventions that can be replicated in other areas in Sub-Sahara Africa [ALIN web pages, www.alin.net].

The articles and stories shared through Joto Africa are not only researched articles but they incorporate practical case studies and findings from the field. ALIN often collects these stories from the field through its *Maarifa* centre and through its networks and partners across Africa. The *Joto Africa* Issue 12 highlighted case studies and stories on climate communication for adaptation. Stories were highlighted on how farmers, network with partners such as CARE International, Christian Aid, Kenya Meteorological Department (KMD) and the Climate Predictions and Applications Centre (ICPAC). The aim of this publication was to demonstrate how communities are accessing and making use of weather information, climate forecasts to empower them to make informed decisions concerning their livelihoods. The article also highlights how climate information is communicated to community members and the relevance of enhancing their understanding on uncertainties and probabilities to make use of the available information to support their livelihood and manage climate risks for effective adaptation [Joto Africa, Issue 12]. The information shared

through this publication is aimed to support communities to improve their livelihood through putting it into practice. Through this issue (Joto Africa, Issue 12), ALIN collated best practices from all over Africa and presented it in an easy to follow format for other practitioners, for example, one article in this issue highlights how farmers in Kenya with support from other organizations and institutions such as the KMD, ICPAC, agriculture extension officers and local NGOs have been able to make use of seasonality data to support decisions on planting times and thus employ good farm management practices. In this way climate change adaptation practices are enacted through the sharing of this information through these publications and further, through the *Maarifa* centres, this information is then put into use to assist communities adapt to climate change. As one respondent notes

> *" [..] In Joto Africa we had a story on how CARE is linking with the metrological department and plan for scenarios and linking with farmers, we don't do the real scenario planning [ourselves] but we do halfway and get the information and interpret with farmers and extension workers to know, we tell them, you can plant cow peas, you know crops that are short term [..] [ALIN, Respondent 1]*

As can be seen, ALIN enacts climate change adaptation practices through sharing of information and knowledge through publication of Joto Africa. By incorporating material elements through this publication and by sharing this knowledge through sharing of the skills and technical knowledge, climate change adaptation practices in ALIN are enacted. These practices are also enacted by the fact that this information and knowledge is performed at the ground level, where ALIN field offers interpret this information and apply it directly to the situation the farmers are facing. By working in partnership with other organizations, researcher and extension workers, ALIN is able to further develop its adaptation practices by making use of the competence from other organizations to strengthen its adaptation practices. The use of ICT materials and dissemination tools such as through this publication are therefore essential pieces of the 'puzzle' that ALIN uses to enact these adaptation practices, by so doing, the information sharing content and tools therefore acquire new meaning as avenues to enact adaptation practices.

5.4 Climate Information Performed through Knowledge Sharing Practices in ALIN

The adaptation activities that ALIN is engaged in revolve around providing adequate and correct information to community groups to enhance their adaptive capacity to climatic events thus adapting their livelihoods to impacts of climate change. ALIN therefore integrates climate information into its knowledge sharing practices by sharing information and knowledge. This is done in relation to the community groups the organization works with. Each community group is different and has different cultures, beliefs and livelihood practices. Therefore the climate adaptation practices that ALIN enacts are in recognition of this social context and thus apply climate information to fit into this context. It is the *situatedness* of the adaptation practices within the community's traditions and practices that has shaped the uptake of climate information. ALIN often works with two types of community groups, that is small-holder farmers and pastoralists. It has therefore made use of climate information in the form of seasonality data and early warning information to assist these groups to make informed decisions that support their livelihood practices. By connecting with the organization's mandate in information and knowledge sharing through its

three pillars that is access for information, knowledge management and community empowerment, ALIN is able to make use of the organization's material and human resources in terms of technical knowledge and skills to support information that promotes adaptation practices.

ALIN has worked closely with the Kenya Meteorological Department (KMD), to receive seasonality forecasts for the different geographical areas that they work in. This information is therefore interpreted in order to make sense to the community members. ALIN then links up with the Ministry of Agriculture extension officers stationed in their field sites, who assist in tailoring seasonality forecast with agriculture productions, they would do this for example by providing knowledge on the types of crops to grow, how to crop the crops, when the crops are to be grown, when to harvest, how to add value to the products among others. This is done in partnership with ALIN field officers stationed at the *Maarifa* centres, by organizing workshops, farmer field schools and other capacity building activities.

> *'We work closely with the ministry departments especially the ministry of agriculture and of course we get the climate information or weather information from the Meteorology department so normally what happens, they [ministry officials] will help us know the best crops to plant where and what time, we really link with them and work with them especially when we are doing capacity building, we get the extension works from the ministry of agriculture or livestock depending on what we are doing, so they help us build the capacity of the community and advise the farmers on what to plant where and when' [ALIN, Respondent 1]*

The adaptation practices that are carried out therefore take into cognition the type of community group that the organization is working with and the areas in which it works. These practices are therefore situated in the context of the organization's mandate and the community traditions. It is for this reason that ALIN was able to use its competence in information sharing and dissemination to incorporate seasonality data into the adaptation practices. This took place through disseminating the seasonality forecasts in *Maarifa* centres, conducting farmer-field schools and training to community members on response to seasonality data and through collaborating with Agricultural officials, they were able to train the community on the implication of the seasonality data.

ALIN works closely with partner organizations such as the KMD and other non- governmental organizations such as Livestock Information Network and Knowledge System (LINKS), these organizations provide early warning information on expected droughts to pastoralist groups, ALIN therefore disseminates this information to the farmer groups. This is done through the *Maarifa* centres, bulk text messages among other avenues. For example, while working with pastoralist communities, ALIN is keen to inform the groups on expected climatic events such as droughts and the extent to which the drought would affect the region and possible adaptation and coping options that the groups can take. For these groups, they provide adaptation options on expected drought by informing the community of the available options in adaptation. These include reducing the number of cows and substituting with goats which can handle drought situations more productively than cows, or in production of hay. These strategies are taken up by community groups such as in Mutomo, where communities are looking at the possibility of feeding livestock with drought resistant root tubers. Application of climate information is therefore situated in the organization's

technical capacity to understand climate information, organizational mandate and the community culture and traditional practices.

> *"We have used early warning systems in various communities especially the ones keeping livestock, when we get that information on early warning system we disseminate to them, we have a meeting with them, we help them plan, but culture makes them rigid, what we have seen them to do is to move with their pastures to greener pasture depending on the early warnings system, some of them we are happy that they are able to keep hay mainly done in Ishinya, some in Kyuso communities will destock their cows, but majority keep very few, around three, but they will keep a lot of goats because they are more resistant and can survive longer than cows, some of them look for the root tuber to feed their animals, so what they do is that when they know that in three months we are going to have drought, they now start looking for the root tuber"[ALIN, Respondent 1]*

Adaptation practices in ALIN revolve around the key pillars that form the working programme structure of the organization. These pillars are: access to information, knowledge management and community empowerment. Under these three pillars, ALIN is able to develop projects and programme that are part of these three pillars. Adaptation practices are therefore situated in the organizational structure. For example, adaptation practices in ALIN related to adapting to drought conditions are developed by drawing on the organization's competence in information dissemination to provide relevant information on drought to rural community groups. These approaches related to the three pillars in terms of access to relevant information on drought which provides knowledge to the community on how to act when drought occurs and later this builds their capacity to better handle the drought conditions. ALIN has used this approach to draw out adaptation activities such as building the capacity of the community through farmer-field schools, workshops and training on agronomic practices such as planting drought resistant crops. These practices are therefore situated within the context of the organizational structures through its three pillars. As one respondent notes,

> *"We operate under three pillars, the enabling access pillar, this provide access to information like equipping the Maarifa centres (community knowledge centres) with information, in this we establish physical structures, the second pillar is the Knowledge management pillar, through this pillar, we focus on the content of the information generated, this is done through repackaging information, simplifying it, collating it form partners, and matching the information needs of the community. Finally we have the community empowerment pillar, this we do real projects, such as capacity building, training on various issue such as keeping kitchen gardens, planting drought resistant crops, energy saving stoves [..]" [ALIN, Respondent 1]*

Adaptation practices in ALIN are situated in the community's cultures and traditional practices. Through this ALIN incorporated climate information that relates with the community needs and traditional practices. By applying seasonality data and climate data through early warning systems, ALIN is able to integrate this climate information into the community traditional practices of pastoralism and small-scale farming. It does this by providing information to the framers and pastoralist that would support them to make decisions such as the type of crops to plant and when they are planted, when to expect dry spell and therefore pastoralist are able to make informed

decision on selling their cattle or migrating to other lands with better pasture. This climate information is therefore applied to the community's livelihood practices. By situating adaptation practices in the community cultures and traditional practices implies that ALIN develops content specific adaptation practices and therefore also makes use of climate information related to the specific community's culture and traditional context. This brings about a variation in the climate change adaptation practices that ALIN promotes. For example, while working with community groups in Mutomo, ALIN recognizes the need to assist the communities to adapt to climate impacts by addressing adaptation to drought conditions. This is also taken in context of the communities' traditions, cultures and customs in regards to their livelihood activities, in this case farming. Basing on this, the activities that are then constituted are based on addressing drought through adopting better farming techniques such as planting drought resistant crops such as cassava. On the other hand, while addressing drought-related issues with the pastoralist community groups in Ngruman, ALIN shapes its adaptation activities to fit into the pastoralist cultures and traditions of these community groups. Therefore ALIN initiate adaptation activities such as preserving pasture, de-stocking or applying early warning systems among other activities. As noted ALIN addresses similar environmental condition – that of drought – however the climate information shared and disseminated to these two communities to address the same issue – drought- is packaged in cognition of and to suit the community's traditions and needs. The adaptation practices developed are therefore situated within the community cultures and traditional livelihood practices.

In a similar manner, this approach of situating adaptation practices within community culture and traditional practices has been taken up by one of the key informant organizations, African Conservation Centre (ACC). For them integration of climate information into adaptation practices does not just include applying scientific data into adaptation but it also involves incorporating indigenous climate data in adaptation practices. This means that applying climate data requires a good integration of both the science and the local climate data. Climate adaptation projects run by ACC therefore involve a participatory approach in which ACC scientist and local community members are involved in developing climate change adaptation practices that make both use of science and community indigenous climate knowledge. This indigenous climate data includes community accounts of past climate data as well as observation of environmental conditions. This often involved communities narrating stories such as giving accounts of the planting and harvesting seasons, the changes in rainfall and drought over the years, the type of vegetation that was dominant in the past among others. ACC therefore uses this data and combines it with scientific data of the recorded and collected environmental data that involved recording the indicator species, grassland species, and bird migration periods among others. These social aspects - indigenous climate – play a key role for ACC to take into consideration when developing adaptation practices for community members.

> *'The approach we are giving is trying to link science and community indigenous knowledge, our interventions are generated with the community and they come up with simple ways of coping that every member of the community can identify with' [ACC, Respondent 1]*

Similarly, climate change adaptation projects at Christian Aid also follow this same approach. For Christian Aid, they recognize that the community groups have their own 'local metrological experts'. For example when presenting climatic data to communities in Moyale, Christian Aid had

to consider the local weather men who had their ways of reading signs of the weather through observing birds, or the diet of certain animals or the migration of certain animals to certain area. This type of local knowledge has been integrated with predictions from the meteorological department in order to develop early warning systems for the community to adapt to foreseen drought events.

For the case of Christian Aid, climate information is integrated with the community's practices (such as the pastoralist way of life and recognizing these cultures). The adaptation practices are therefore a product of this integration and are situated through the community's traditional practices to ensure that the practices consider both scientific information such as seasonality data but this is considered alongside community traditional practices. One such approach is combining climate data from the Meteorological department with local climate knowledge from the farmer groups. For example in a project in Mberee region, Christian Aid is working in partnership with other local church organizations and farmer associations to relay seasonal climate forecasts to the farmers, the farmers then take the information and interpret it alongside with their local information and discuss viable options.

> *'We are running a climate information services project involving 2000 farmers in Mberee where the Meteorological provides these communities with one seasonal outlook information, and with monthly and weekly information, this involves relying MET data to agriculture extension officers who then discuss with MET people the implication of the seasonal outlooks in order to discuss with farmers. [..]. Farmers have indigenous indicators so if you tell them it will rain in one week they will check with their indigenous information [..] before they start land preparations [..] the seasonal outlook is important to them and they would like to strongly know when the onset of rains will be, also the monthly and weekly forecast are important as it affects weeding, fertilizer application [..] for some like in Moyale, the data from the MET is always checked against local knowledge, for example elders would slaughter a goat and study the intestines to know if there would be a drought and for how long' [Christian Aid, Respondent 1]*

Climate information is therefore performed through the adaptation activities enacted by ALIN and as shown through examples of ACC and Christian Aid respectively. For ALIN, as the organization's key competence is in information and knowledge sharing, its adaptation practices are also situated through this competence. Further, adaptation practices are developed in cognition of the community culture and traditional livelihood practices, therefore integrating climate information into the adaptation practices makes use of this social context.

5.5 Conclusion on Case Study 1: ALIN

The findings presented from the case study indicate how ALIN enacts climate change adaptation practices through knowledge sharing by incorporating elements of material such as the use of *Maarifa* centres, the competence such as technical skills of integrating seasonality data and thus the integration of these elements brings in new meaning into these practices. These practices thus

provide knowledge to communities to make informed decisions to support their livelihoods towards climate change adaptation.

These findings also indicate that climate change adaptation practices are enacted when the material, competence and meaning are performed in time and space through sharing of information and knowledge through the networks and other social interactions. ALIN's adaptation practices are situated both through the organizational structures that guides on what adaptation practices to take such as practices related to knowledge and information sharing, as well as are found with community culture and traditions. This implies that these adaptation practices are found in this social context are shaped by the culture and traditions in this context. This explains why different adaptation practices are enacted to different community members (such as farming practices differ from pastoralist practices). This *situatedness* of the adaptation practices explains why ALIN integrates different forms of climate information into the adaptation practices. The form of climate information practiced fits in with the community's traditions and cultures as well as the organizational mandate. This indicates that climate information is therefore performed in the adaptation practices through interactions with the community's culture and traditions, these activities are context specific, that is occur in a given location. This explains why adaptation practices performed by ALIN to communities in Mutomo (eastern Kenya) differed from communities in Kajiado (central Kenya), as they were performed in a given location with a given community group. By applying the knowledge and information that is shared through various platforms that ALIN has (OISAT, Publications, *Maarifa*) and activating the practices by performing them through practical demonstrations, farmer-field schools, trainings and field-exchanges, they in turn enact these practices. Adaptation practices can therefore be explained through 'learning by doing' that implies by taking part in farm-demonstrations, communities members are in turn learning how to carry out adaptation practices and thus simple elements of material, meaning and competence are linked, enacted and find new meaning as climate change adaptation practices situated in organizational structures and community traditions. Therefore we can conclude that adaptation practices in ALIN are situated within different social contexts (such as practices related to farmers vs. practices related to pastoralists), also the organization's mandate determines the type of adaptation practices that ALIN engages in (i.e. mandate in knowledge sharing bring out knowledge sharing practices e.g. farm demonstration on cultivation of drought-resistant crops). ALIN's adaptation practices are situated in its competence in information sharing, and through the networks and partners that it interacts with (such competence in use of seasonality data and partnering with agricultural extension officers and KARI), this *situatedness* of adaptation practices determines the type of climate information that ALIN incorporates in adaptation practices (such as use of seasonality data and early warning systems).

5.6 Case Study 2: Environnent Liaison Centre International – ELCI. An Overview

ELCI is a membership organization that networks civil society organization (CSO) in Kenya. It has a worldwide membership base of over 800 members. Its mandate is to act as a liaison agent among civil society organization at the grass-root, national and international levels. ELCI's thematic areas lie in natural resource management, climate change and environmental governance. This is achieved through strengthening CSO's governance, leadership, knowledge, skills, communication and advocacy capacities. ELCI has been operating in Kenya for the past 50 years with a focus on

national projects such as the advocacy of the adoption of unleaded fuel in the Kenyan market to the advocacy of deforestation in Kenya. ELCI is currently drawing its focus to also address grass-root issues by implementing projects with target community groups. As a liaison organization, ELCI supports local CSO's by developing their knowledge, skills, competences, resources, governance and leadership capacities, thus strengthening then to enhance their livelihoods and enhance their sustainability [ELCI web pages, www.elci.org]

5.7 Capacity Development Practices supporting Climate Change Adaptation in ELCI

Capacity development practices in ELCI have evolved over the past 50 years that the organization has been in existence. ELCI positions' itself not only as one of the oldest conservation organization in Kenya, but also among the champions in environmental governance and advocacy issues in Kenya. This mandate has been shaped over the past 50 years that the organization has been in existence. Starting out with an international focus on environmental governance linking civil society organizations globally and in Africa with governance issues at the international scale through addressing issues at UNEP (United Nations Environmental Programme), the organization has over the years shifted focus to addressing the issues starting from the grass-root, national and then international level [ELCI web pages, www.elci.org]. The shift of focus came about to not only meet the emerging global trends in environmental issues but also to strategically position in order to meet donor requirements and thus remaining relevant in the environmental field. In relation to climate change adaptation practices, ELCI supports CSO through developing their knowledge, skills and competence on issues related to climate change through advocacy and awareness projects as well as through supporting CSOs in implementing on-the-ground tangible climate change projects. Climate change adaptation practices in ELCI are thus enacted when material elements such as the tangible projects e.g. the constructed water tanks/ pans, are integrated with competences in running climate change advocacy and awareness trainings and workshops. In so doing, new meaning of these activities as climate change adaptation practices is thus enacted.

5.7.1 Advocacy Climate Change Adaptation Practices in ELCI

Capacity development practices at ELCI are implemented through advocacy and awareness programmes. ELCI has been carrying out climate-related projects and programmes over the years, although these programme and projects were not initially regarded as climate change programmes. Over time the performance of these programme have undergone adjustments in their activities as new competence are developed through incorporating advanced skills and knowledge in climate change, new material elements such as use of IPCC reports are also proving useful in shaping activities towards addressing climate change impacts. This adjustment in activities and projects by incorporating new material and competence also reflects on the current global trends on climate change issues that fit into donor interests. New meaning of these practices is thus developed as new material and competences are taking into consideration when developing adaptation practices in ELCI. For example, ELCI has in the past carried out three projects that strongly related to climate change and adaptation, but they were not keenly addressed as such. One such project is the 'RIODE' - Desertification project that aimed at enhancing sustainable land management, through training communities to improve their farming methods such as rearing cattle, proper use of technology in order to sustain community livelihoods and reduce impact on desertification. This

project started out as a desertification project aimed at reducing impacts of desertification on communities and their livelihood. However, with new trends in ELCI's programming by incorporating new knowledge on climate change through IPCC reports and use of available tools such as internet sources and metrological data, the same activities carried out in the past have now developed new meaning as climate change adaptation activities. This new shift has brought in new meaning to activities carried out within the organization, thus climate change projects have been born through this.

Adaptation practices have also emerged by incorporating competence through skills and technical know-how from its network members. Drawing on the largest network, expertise and the number of years in experience, the organization has been able to refocus and address key issues and strategically redefine components of its programmes. For example, over the years the organization has worked on lobby and advocacy issues concerning deforestation issues in Kenya, this was facilitated due to its large network of civil society organizations that were the 'voice' behind which the organization was able to rally its campaigns to reverse the excision of forest land,

> *"[..] ELCI also builds capacity of CSOs in what we call linking global to local and local to global, whereby with our extensive networking and technical capacity we are able to draw from the world level environmental movements, environmental negotiations, technologies that involve environmental problems, we are able to bring down those to bear on how local communities do their work" [ELCI, Respondent 1]*

Climate change adaptation practices in ELCI have thus evolved from previous practices as links between desertification activities and drought related activities were made by drawing on the successes of past desertification projects in ELCI such as RIDOE. The performance of these activities over the time the organization has been in existence and through sharing of best practices through its network members adaptation practices have been enacted. These practices have thus developed new meaning, as not desertification practices but as climate adaptation practices. This came into being through performance of these activities by incorporating new elements of material and competence, such as technologies employed to deal with drought-related activities and the new developments in climate change science. It is these new technologies that ELCI has made use of thus improving their understanding of climate related issues and developing new competence through its network members and civil society organizations to deal with activities by addressing climate change phenomena. This new approach has changed the meaning of the practices carried out in the organization to represent practices geared towards climate change adaptation. One such example is the Kajiado climate change project.

The interviews and discussions revealed that ELCI heavily relied on the competence it had developed over the past 50 years in running advocacy projects to define the strategic direction of programmes within the organization. By creating this niche and building on success projects that were effectively carried out in the past, the organization was able to define its niche in advocacy and governance issues in Kenya. Drawing on material elements through its network of members across the globe and in Kenya, ELCI has been able to use the available resources to scale down its activities from a global level to local level, ensuring its activities remain relevant among its members and community groups. Meaning is therefore incorporated in these practices as the activities carried out

at the global level were less relevant to the community groups on the ground and only attracted minimal donor support, therefore the same activities were scaled down to the local grass-root levels and brought in new meaning in advocacy and governance issues at the grass-root levels. The Kajiado climate change project further demonstrates ELCI's adaptation practices.

5.7.2 The Case of the 'Kajiado Climate Change Project

To further illustrate how adaptation practices are enacted in ELCI, I take on an example of the Kajiado climate change project. The Kajiado climate change project was developed to address two main issues, one was to strengthen the skills of local community based organizations in Kajido by empowering Maasai women to participate in decision making, and to build their entrepreneur skills that would improve their livelihoods and secondly was addressing climate change impacts represented through increase drought, water scarcity and land degradation. Building on the partnership and network that ELCI has with local grass-root organizations, it was able to involve active participation of the community groups into the project. The community (mostly the Maasai community) was able to identify problems of water scarcity and water borne diseases, degraded landscapes and reduced livelihood options. These issues were then collectively reconstructed with the community, local community organizations and experts in this field. Activities were then formed such as construction of water storage facilities such as water tanks and water pans, construction of kitchen garden to diversify livelihood and initiation of revolving funds and micro-finance schemes to enhance economic empowerment for women [ELCI, Project report 2013; climate change and women empowerment project]. Further, with the emergence of new knowledge on drought and the causes of drought, this brought about the idea of addressing the root causes of such phenomena such as drought as opposed to handling specific issues. It is then that climate change issues were incorporated into the project planning and implementation of this project. Although in isolation the activities proposed for the project were presented as normal livelihood and development issues, however, when performed and carried out together, they emerged adaptation activities geared towards reducing the impacts of climate change through adaptation to water scarcity by construction of water tanks to collect and store water, and diversifying livelihood to reduce reliance on pastoralism that was hugely affected by recurrent drought due to climate change. In essence this was ELCI's first climate change adaptation project. This case shows the process in which ELCI undertook to develop activities for the project. It also demonstrates how new meanings emerge by incorporating new knowledge as the links between drought and climate change became clearer. By linking isolated activities by making use of the available material elements such as technologies such as accessing information on drought from technical reports published online, the project was able to address issues of drought and water scarcity not just as an isolated phenomena but by incorporating it into the wider perspective of climate change activities. By incorporating competence from the community, partner organizations and ELCI, was able to creatively come up with project activities that would collectively relate to the two main objective of the project. By holding training and workshops, ELCI was able to build the capacity of the community to understand the phenomena behind the recurrent drought in the area. At the end, the construction of water tanks were now not just seen as water conservation activities but they found new meaning as climate change adaptation activities in the eyes of the community members, these activities were clearly linked to adapting to climate change through adapting to the recurrent drought conditions. Thus climate change adaptation practices in ELCI are enacted when practitioners conduct capacity building activities and

incorporate new material elements such as data on climate change from IPCC reports and new competences. This in essence brings in new meaning into the activities. The performance of these practices through capacity building activities enacts climate change adaptation practices in ELCI.

5.8 The Performance of Climate Information in Advocacy Practices in ELCI

Findings reveal that other forms of climate information such as data from past climates are applied advocacy practices that support climate change adaptation in ELCI. The choice of the type of climate data taken up is determined by the organization's capacity to make use of the data and its understanding of the data. This implies that adaptation practices in ELCI are situated in the social context represented through the organization's mandate and through local community cultures and traditional livelihood practices. These contexts thus determine the type of climate information that is applied in the adaptation practices. Climate change adaptation practices are thus enacted as ELCI engages with its network members and with other CSOs. To implement its activities, ELCI draws on the support, technical capacity and knowledge from its network members. ELCI incorporates climate information by making use of past climatic data in the form of data from global technical reports. For example, when designing the Kajiado project, ELCI made use of consultancy reports that utilized data from global reports on IPCC project situations in Kenya, government documents among others. These reports present an indication of the impacts of climate change and the changes in the climate that occurred in the past. It is based on this data that the Kajiado climate change project was developed from. ELCI therefore developed its adaptation practice in response to information collected from these reports. Adaptation practices applied were therefore guided by past climatic data. For example, the climate data from Kajiado reported that the past climate had experience long and continues droughts which were getting worse every year. This data therefore shaped the adaptation activities to be directed towards responding to the drought situation in the region, it is from this point that the organization therefore initiated activities such as water harvesting through water tanks, irrigation activities, and creating awareness to the target group on use of less water for domestic purposes.

> *'Kajiado is generally a dry land area with climate change they are experiencing longer drought spells much longer then before this compromises the ability of the people to engage in economic activities, these people keep cattle and sell curios, with less and less water they keep less livestock as they need this for survival, so with reduced livestock their livelihood is down, so in consultation with then we thought of coming up with options to assure them of a daily meal and to take children to school' [ELCI, Respondent 1]*

The organization has therefore made reference to climate information from past reports in anticipating of the same climate situation in future. The adaptation practices are therefore initiated to the community through capacity building workshops and trainings. For example, In Kajiado, ELCI has been conducting trainings on climate change for the community groups to inform them of the expected drought and what this implies to their livelihoods. It is through these mobilization activities that ELCI has been able to educate the community of what adaptation options to undertake and together with the community they have been able to identify priorities in handling issues of less water due to the drought situation. The adaptation practices taken up are therefore

guide by the type of climate information that has been incorporated which is situated in the organization's mandate and the community's culture.

As advocacy plays a big role in the organization, the organization has not only developed frameworks for advocacy monitoring and evaluation of its progress but also taken the opportunity to train its staff members on advocacy related matters through facilitating training for staff members, in order for the projects and programme to be effectively implemented. In this way, staff members have the capacity to not only carry out lobby and advocacy activities but also to link these activities and issues to wider causal problems in order to address these issues from the root case. These links therefore actively connect and enact advocacy adaptation practices in ELCI.

By drawing on its large network of members over the past years, this has defined the type of advocacy adaptation practices that the organization carries out. The advocacy adaptation practices are therefore situated in the context of its network members, this implies that the uptake of climate information is also guided by the information that ELCI draws from its network members. ELCI has an extensive network of practitioners, community groups and experts that it draws its expertise from. Having been in existence from the past 50 years, the organization has been able to slowly develop it key competence and has been able to clearly define its structures and how it operates. For example, ELCI has carried out various lobby and advocacy exercises in the past that have been successful in execution and the uptake of the issues at the policy level. This has been attributed to its expertise, network of practitioners and the ability to have the capacity to carry out its practices over the years, while learning from its mistakes.

> *"'ELCI is largely an advocacy organization, [..] we are really big on advocacy, basing on the existing knowledge with the groups we are working with, we try to back advocacy with modern science" ELCI, Respondent 2]*

Just like ELCI, past climatic data is often used as a reference point or baseline when developing projects, such as the Kajiado project. In a similar manner, interviewees from other key informant organizations revealed that organizations such as [African Centre on Technological Studies] ACTS also make use of this data. This is done through retrieving historical climatic data of the local area from past reports, this enables organizations to have an understanding of the climatic situation of that area in the past. The most common data that was sourced from ACTS include rainfall patterns, temperature variations, number of dry days vs. number of wet days. This type of data was then used to develop projects that would seek to address the situation of the particular area. For example ACTS developed several adaptation practices for communities living near flood prone areas. ACTS made use of historical climate data to study the past climatic conditions of the area related to flooding this enabled them to assess the vulnerabilities in the area and map out the vulnerable areas that would require immediate intervention. The application of this type of climate information was viable as the organization has the competence to address adaptation through carrying out vulnerability mapping exercises. Adaptation practices are therefore situated in the organization's competence, this in turn determines the action that practitioners take when incorporating climate information into adaptation practices.

This implies that the *situatedness* of the organizations in the different social context determines what type of climate data it incorporates into the adaptation practices and this shapes the adaptation practices of that organization. As can be seen in ELCI, adaptation practices are situated in the organization's mandate and through the community's culture and traditions. Further, ELCI relies on its large network of members to gather relevant climate data as it is limited in regards to staff available to carry out projects. In contrast to ELCI, data from key informants revealed that the competence of the organizations has an implication in the type of climate information the organization takes into account. For example, findings from the key informant organization such as the Kenya Agricultural Research Institute (KARI) revealed that by situating its adaptation practices largely in the organization's technical capacity and skills, it is also to draw on other forms of climate information such as the climate change scenarios to incorporate into its adaptation practices. This was done by drawing on the organizational competence and technical know-how in downscaling the GCM (Global Circulation Models) data to develop an option of adaptation practices for small-holder farmers. Further, the organization's mandate that lies in scientific research also defines the social context in which adaptation practices in KARI are developed. KARI - a government institution whose mandate is to conducted agricultural research in order to improve the livelihoods of citizens – has over the years developed this capacity through training staff members and working in close collaboration with scientist from the Meteorological department. The adaptation practices are therefore situated in KARI's technical capacity to work with climate change scenarios. KARI's mandate in relation to climate change is to conduct agricultural research to assist communities adapt to effects of climate change. It therefore incorporates its traditional practices in agricultural research in order to apply climate data in the form of downscaled climate change scenarios to provide several adaptation options in which community members are trained on good agronomic practices. For example, in certain areas, KARI would receive climate data showing the types of crops that can grow well with the specific future climate, this data is combined with soil data and also data on the viable markets for the crops. This then informs them on which crops to train farmers to grow. One respondent explains this process.

> *"We downscale GCM data to Kenya then to a particular region for a 50 km radius, for example the project in Transmara, we did reconnaissance survey to give a clear view of how people live in the environment, the threats to the area, this informs the vulnerability assessment and looking is the ecological system vulnerably, we looked at the historical data of the area, the temperature and rainfall ranges, then from there we downscale data from GCM, from this we are able to give a basket of options that can work based on where they are and their livelihood based on future climate scenarios. the adaptation options are then informed by not only climate information but also in terms of social economic aspects like is there a market for this crops, which fetches more money, [..]" [KARI, Respondent 1]*

It is through the incorporating of material elements and technical capacity such as in the use of climate data software and technical know-how to down-scale climate data that climate change adaptation practices are enacted. Therefore climate change adaptation practices are situated in the organization's mandate and competence. The various social contexts in which these adaptation practices are found also determines the type of adaptation practices the organizations carries out.

5.9 Conclusion on Case Study 2: ELCI

The findings from ELCI illustrate the different elements that ELCI incorporates to enact its climate change adaptation practices and how these practices are influence by its social context that is made of its network members and other CBOs. Findings also reveal that the adaptation practices are largely situated in the organization's mandate through developing advocacy programme to create an understanding of climate change issues for the community members. By performing advocacy and awareness projects, ELCI enables communities to get a deeper understanding of climate change issues and how they affect their livelihoods. This performance of advocacy and awareness activities enacts climate change adaptation practices in ELCI through connecting with material elements such as community forums, while incorporating competence in advocacy skills aimed at building the community's capacity in climate change issues thus new meaning is created. In a similar manner these results were taken in context of two other organizations, ACTS and KARI which were used to put into ELCI's adaptation practices in context. The results revealed that the organization's mandate and capacity i.e. the number of staff members as well as their competence in regards to their technical know-how in understanding climate change data and climate scenarios, defined the type of adaptation practices the organizations enacted. These adaptation practices were also situated in the social context in which the organizations were situated such as in the scientific networks as in the case of KARI and community traditional practice of fishing as in the case of ACTS. It is also important to note that these findings revealed that adaptation practices are enacted when the links between the elements are created. This occurs through the performance of these practices in a given location represented through the knowledge on climate change that is shared through social interactions such as through ELCI's network members. The links are also created through the implementation of awareness and advocacy projects that incorporate trainings and advocacy meetings that are aimed at assisting communities understand the implication of climate change on their livelihood. When creating this link, adaptation practices are thus enacted and new meaning is incorporated into these practices. Adaptation practices in ELCI are therefore situated in its social networks through its network members and its capacity to understand and integrate the various forms of climate information into its adaptation practices.

5.10 Case Study 3: Kenya Climate Change Working Group – KCCWG. An Overview

KCCWG is a civil society organization whose aim is to coordinate climate change action among civil society groups in Kenya. These civil society groups include NGOs, CSOs among others, through this, KCCWG forms am umbrella body of all organizations that work in the area of climate change in Kenya. They coordinate action by strengthening these groups who are also members of the organization structured in various thematic groups. Civil society organizations (CSOs) who have expertise and specialized in several thematic groups such as on forest, water, wildlife, energy among others contribute to scientific findings, research and action, KCCWG therefore coordinates this research as well as carrying out advocacy, lobby and capacity building activities. KCCWG therefore operates in two levels, at the national level by coordinating action on climate change among CSO members and at the local level where it implements on-the-ground activities such as awareness, lobby and advocacy activities on climate change with community members. To achieve this, KCCWG engages in policy and legislative advocacy on behalf of CSOs, it supports CSO and government departments to participate in climate change debates at the national and international

levels through capacity building, while providing a national platform for lobby on climate justice and through creating awareness for the grass-root communities by assisting them to connect the relationship between climate change and their livelihood [KCCWG, web pages www.kccwg.org]

5.11 Advocacy, Awareness and Capacity Building Practices in KCCWG

KCCWG as an advocacy organization carries out various activities aimed at linking advocacy issues from the grass-root to national to international level. Starting out as a 'loose' network of people working on climate change issues, the organization has over the years grown to define its niche and fit into its capacity. The organization started by rallying civil society voices on climate change issues in Kenya, this was in response to a gap on active participation of civil society organizations on climate change matters in national and international forums. With this new development in the organization, it was able to unite voices of civil societies, government and rural communities in developing and drafting the climate change bill for Kenya. This participatory and consultative process brought about the need to unite efforts in 'pushing' for legislation and policy frameworks on the climate change bill in Kenya [KCCWG, web pages www.kccwg.org].

KCCWG carries out active grass-root advocacy through building the capacity of grass-root organizations on climate change issues, educating them on impacts of climate change how they can cope and adapt to them and supporting their participation in national and international forums on climate change issues. These activities are often donor funded and they vary based on the specific areas in which the donors operate in, where at times they are influenced by donor interests in the area of operation, as a respondent notes,

> *"When KCCWG was forming, it was CSOs, NGOs, and donor institutions, so [donors like] CAFOD and TROCAIRE really wanted to fund advocacy on the climate change bill, they are similar the only difference is their coverage, like CAFOD has its focus in Kitui, Marsabit and Kajiado, TROCAIRE has its focus in Ishara, Meru, Turkana and East Pokot" [KCCWG, Respondent 1]*

Having different donors on board has diversified KCCWG's activities in terms of climate change activities in Kenya. One major input is the focus grass-root community mobilization activities at the county levels. When asked what defines KCCWG, respondents were quick to point to its role in advocacy on climate change issues in Kenya. For KCCWG, its advocacy practices depend on specific combination of materials, meaning and competence. That advocacy was singled out as a key practice in the organization as it brings together these elements. For example it draws on its experience and expertise in successfully running climate advocacy campaigns that led to the adoption of climate change bill by the Kenyan parliament. It also draws on its wide-network of civil society movements in Kenya who are working on climate change issues that bring in expertise, technologies and competence in addressing climate change issues through advocacy campaigns. Advocacy not only then becomes an avenue to addressing climate issues in KCCWG but it is considered as a key practice with a symbolic representation for the organization – thus bringing new meaning into activities carried out by the organization.

5.11.1 Climate Change Adaptation enacted through Advocacy and Capacity Building Practices in KCCWG

The organization was founded on an advocacy foundation which has remained constant over time. The main advocacy issue was facilitating the development of the climate change bill in partnership with grass-root community groups. The wide network of civil society organizations that the organization worked with provided a good foundation for the advocacy campaigns. It is through this wide network and the expertise within these networks that the organization has over time been able to develop further project and programme and establish its niche in climate change advocacy with a focus of linking grass-root community initiatives to national level initiatives.

KCCWG has not been carrying out on-ground implementation activities on climate change adaptation that are feasible. Rather it has recently done so through training, capacity building, workshops and other forums. Its mandate has been to strengthen other grass-root groups and civil society movements in their understanding of climate change issues in order for them to draw out possible action point for adaptation. It is this combination of know-how, new meaning and techniques that has led to new practices in the organization.

> *"KCCWG is a national network, so we have established county level networks in all the counties, we started with non-state actors in all the counties but later on we did an exercise to map out all the actors in each county, so we have state and no-state actor coming on board as part of the networks, so we don't go and implement activities e.g. we start a water project or crop cultivation or anything like that, but we do climate change advocacy, so with the networks we are strengthening their capacity to conduct activities on their own with us, but what we do, we use them as a basis for mobilization" [KCCWG, Respondent 2]*

KCCWG was mainly focussed on working through its thematic groups and drawing in its membership to bring out issues through these groups. Through donor support and increased network coverage, this focus has now shifted from mainly working with the key thematic groups such as on water, forest, energy among others but now dealing with community needs and championing advocacy adaptation initiatives through on-ground community activities. One such example is through a project initiated with Oxfam in which the organization was able to build the capacity of the community groups in Kapenguria in West Pokot to respond and adapt to climate change issue through embracing traditional farming methods. This approach was of particular interest as the pastoralist Pokot community are now shifting to embrace farming. An extract from a local daily newspaper captures this transformation

> *Title: 'Pokot embrace farming, quit pastoralism'. "The lives of cattle reliant Pokot is gradually changing thanks to a programme by two organizations to promote traditional farming methods and domestic practices to mitigate the effects of drought and climate change in the area. The organizations [KCCWG & Oxfam] are capacity building the groups to grow traditional crops such as pumpkins, sorghum, finger millet and vegetables to fortify food security and gain nutritional value" one beneficiary from the women groups notes "traditional crops are easy to farm as they are mostly adaptive to this area's climate. Apart from providing food for us,*

farming is a source of income because we get to sell the surplus" [The People newspaper, Saturday 9th November 2013]

This case shows that KCCWG starting out as a 'loose' network had no defined practices in climate adaptation interventions. It set out to achieve one main activity that is coordination of civil society organizations in Kenya, this activity came about as a reaction to the lack of civil society participation at the national and international forum. As a loose network of several organizations that formed the organization, KCCWG had no unified and coordinated practice; rather, these practices were borrowed and influenced from its active membership organizations. It is through that that the organizations were able to attract donor funding from different donors all with a different focus, this translated to the organization spreading its mandate in relation to funding opportunities. Different projects that were implemented focussed on different practices, for some donors advocacy and governance issues were relevant this linked up with advocacy on the climate change bill, for other grass-root awareness raising practices were important this linked up with the climate hearings, yet to others advocacy at international forums was deemed important, this linked up to representation of civil society in the CoP of the UNFCCC. The different practices carried out resulted in competition and collaboration between practices in KCCWG. It is also noted that through the diversification of activities and focus from thematic groups to grass-root community groups that the organization has been able to meet specific community needs, by shifting from shifting from advocacy to capacity building practices.

Adaptation practices in KCCWG are found to not only be situated in the context of the organization's mandate, the communities' traditional practices, but also in the context of donor interest. These contexts define the type of adaptation practices enacted in KCCWG. By developing activities while taking recognition of donor interests implied that activities in KCCWG are developed while bearing in mind the practices that are likely to be supported by different donors or what donors were interested in funding. Climate adaptation practices in KCCWG are situated in donor support and interest. Adaptation was not KCCWG's initial focus. This has slowly come into existence over time. Starting off as a 'loose network' of civil society organizations working on climate change issues in Kenya, KCCWG has evolved to become a recognized umbrella body on climate change issues in Kenya. As an umbrella body, the organization represents other civil society organizations in national and international forums. This gives the organization due advantage to strategically position itself to access information, knowledge and resources to grow the organization.

Over the years, KCCWG expanded its mandate by actively engaging with other organizations and donors through its large network of members. One major contribution to this, are the number of donors who have shown interest working with KCCWG. Different donors have in some way 'influenced' the activities of the organization basing on their interest. For example, the different donors that the organization has worked with have shown interest in funding different things which the organization has therefore positioned itself to receive the funding and therefore incorporate its activities into the plans. The Heinrich Böll Foundation (HBF) for example, has shown interest in funding projects on climate change and gender in which the organization has then strategically positioned itself to include gender aspects into its activities, which was not its main focus in the first place. Further through the CRM funding, the organization has embarked to conduct on-ground level activities mainly related to promoting climate change adaptation practices in several counties, this

was initially not its goal, as the organization had been focussing on national level advocacy and climate hearings in the counties, however through this funding from CRM the organization has gone a step further to employ county liaison officers who are based in the areas in which the project supports.

> *'CRM project is the first [project in which] we are having staff on the ground' [KCCWG, Respondent 2]*

> *'Our activities have been so much on awareness but now we are moving into capacity building, that is what TROCAIRE and CAFOD are trying to focus on, they told us you have been so much on the national scene so now you need to go back to the grass-root and build capacity of the grass-root' [KCCWG, Respondent 1]*

The donor interest in funding KCCWG activities has largely contributed into the shift of activities especially at the grass-root level. As a result, this has seen the organization incorporate more focus on activities that enhance the capacity of the local community groups to adapt to effects of climate change. Capacity building activities like trainings, workshops have thus been incorporated into the programming to meet this need. For example, the organization has been able to work with Pastoralist communities in Pokot to train them on how to farm traditional vegetables as a way to adapt to the harsh climatic conditions of the area. This focus of adaptation activities such as farming systems for pastoralist communities, has strategically given the organization due advantage to receive donor support.

5.12 Application of Climatic Information in Adaptation Practices in KCCWG

The application of climate information in KCCWG is situated in the context of its organizational mandate, donor interest and community traditional practices. For KCCWG, at the national level, it is involved with advocacy and lobby on climate issues and this requires conducting detailed studies on impact of climate change in different regions of the country while documenting already existing climatic events and community's responses and needs. The organization has from time to time referred to information containing climate data of the whole country and in specific regions. This data has then been looked at keenly in relation to the already experienced climate situation on the ground. It is this kind of advocacy that has shaped and provided insight into climate adaptation that is aimed at influencing policies surrounding adaptation.

This generic data on past climate events happening in certain regions has been used as benchmark data to speculate climate events in the future. It is reference to this data through detailed reports, following proceedings from the Conference of Parties (CoP), taking part in national forums that KCCWG has relied on to give an indication of climate in future. Based on this understanding, they are able to draw out actions that have defined its programme and projects. For example, it is these accounts that initiated the development of the current CRM project – in which one component of the project looks at the access and use of climate change information in arid and semi-arid lands in Kenya. The project also goes a step further in building the level of awareness of the community groups in understanding how climate change will impact them and building their capacity to be able

to deal with these impacts [KCCWG project report: Access and use of climate change information for ASAL areas in Kenya]. Application of climate information in form of the historical data is influenced by the organizational capacity to understand and interpret this information to draw out adaptation practices.

In developing capacity building activities for the Pokot community, KCCWG made reference to generic past climate data to get an understanding of the climate situation in the region. Through this, the organization was able to initiate capacity building activities that develop the community's skills and technical capacity in growing indigenous crops. This explains why the organization initiated farming livelihood adaptation practices to a pastoralist community group. The adaptation practices are largely situated in the context of the organization's mandate and donor interests. This implies that the community's traditional practices are regarded if it initially fits into the organizational mandate and fits within donor interests. In contrast, other organizations interviewed showed that their adaptation practices were initially influenced by the community's traditional practices. For other organizations such as IEWM (Institute of Environment and Water Management) application of climate information is situated in the local knowledge and traditional practices of different community groups. IEWM, works with community groups who rely on traditional knowledge to know when to plant. IEWM then integrates traditional knowledge and seasonality data to help the community to understand how the seasons will change and therefore make decisions on what actions to take. This information also informs the type of agriculture practices to promote, this eventually informs the type of training to be carried out.

The understanding of climate information by practitioners also plays a role in defining the type of climate information that practitioners take up. Further, by performing the climate change adaptation practices, practitioners enact and activate these practices. For KCCWG as a network of other civil society organizations in Kenya, performance of these practices comes about through the social interaction and knowledge that the organization draws form these interactions. This knowledge shapes their understanding of climate change and thus shapes how climate change adaptation practices are performed in practice. Furthermore, this often determines how climate information is thus incorporated in the adaptation practices. These social contexts vary and the performance of the adaptation practices also varies. For example, in contrast to KCCWG, the adaptation practices initiated by Wetlands International are situated in the ability of Wetlands International – Kenya, to work in close collaboration with partners such as the Climate Centre International and making use of seasonality data to assist communities to respond to climate related disasters. This implies that Wetlands International - Kenya incorporates different materials and competences and actively performs its adaptation practices by making use of its social networks such as with the links with the Climate Centre International. For instance, Wetlands International is partnering with the Red Cross Climate Centre to implement a climate adaptation project in Ewaso Nyiro in Kenya. By recognising that it (Wetlands International – Kenya - WIK) lacks the necessary competence, technologies, human and material resources in downscaling climate change scenarios, WIK partners with the Red Cross Climate Centre to receive downscaled climate information in terms of seasonality data regarding drought and flooding. This data is then packaged in terms of early warning action for communities living in disaster prone areas to respond to these disasters.

"We identify vulnerably communities through vulnerability mapping exercises [..] people suffer since they don't have information so we promote a concept of early warning and early action, we partner with the climate centre to get climate information on weather and this information is shared with communities, we link the communities upstream and downstream telling them its hitting hard here and you need to respond, [..] the interventions can be based from humanitarian or development angle like diversify livelihoods, that lessen vulnerability"[Wetlands International, Respondent 1]

5.13 Conclusion on Case Study 3: KCCWG

The findings reveal that KCCWG develops its adaptation practices based on the social context in which it is situated, this social context has evolved in time and space. For KCCWG this social context was identified as the organizational mandate (i.e. in national level advocacy through supporting the climate change bill and in on-ground advocacy activities such as through climate hearings and capacity development activities) and in donor interest. Furthermore, findings reveal that adaptation practices are also enacted when the link between the elements of material, meaning and competence are created. For KCCWG by performing advocacy and awareness activities, stronger links between climate change and livelihoods were made. This understanding implied that adaptation practices were thus enacted and linked through conducting advocacy projects. The social networks in which KCCWG was situated in thus also influenced the type of climate information it incorporated, for example its interaction in CoP of UNFCCC meant that they could access and understand general climate data from IPCC reports or summaries. For KCCWG climate information was incorporated through application of generic climate data mainly from IPCC technical reports and summaries. The findings also indicated that different social contexts are at play in KCCWG and these social contexts results in competition and collaboration between practices in the social context. For example practices situated in donor interest such as climate change projects related to gender issues vs. practices situated in community traditions such as developing capacity of pastoralist communities in farming. As indicated that adaptation practices in KCCWG were situated within donor interests, such as the development of projects after donors interest such as the HBF gender climate change project. This often implies that different social context such as that of donor interest vs. that of the organization's mandate may result in competition and/ or collaboration between adaptation practices. In conclusion it was noted that there was competition between practices situated in different social contexts, further adaptation practices in KCCWG were influenced by its mandate, donor interests and its network members.

Table 3 below gives a brief summary of climate change adaptation practices in the three case study organizations.

Table 3: Characterization of climate change adaptation practices for the three case study organizations in Kenya

Name of Organization	Focus area and Speciality	CC Project / components / target group	Nature of adaptation strategies/ plans and activities undertaken	Source of Climate Information
ALIN	Arid and Semi-arid area Deals with information disseminatio n for Arid and Semi arid lands	Project: Knowledge Sharing for climate change Adaptation Coverage: community groups in eastern region 2 *Maarifa* centres	Facilitating community awareness and response on climate change Producing and documentaries on climate change i.e. sharing of best practices Publishing and disseminating articles on climate change adaptation Participating in climate change forums	Internet MET department Partner organizations: KARI,
		Project: OISAT project Coverage: all *Maarifa* centres Small-holder farmers	Organic pest management practices i.e. use of other plants to manage crop pests (e.g. *Aloe vera*), responding to i Increased pest invasion and lack of low-cost sustainable pest management techniques	Internet Partner organization in Germany
		Project: Joto Africa and Baobab publication projects	Documenting and sharing climate change adaptation interventions that have worked in Sub-Sahara Africa (best practices e.g. tubular biogas, water harvesting techniques, practical ways of planting drought resistant crops and trees etc)	Practical cases with different groups Internet Research organizations such as KARI MET department

Name of Organization	**Focus area and Speciality**	***CC Project / components / target group***	**Nature of adaptation strategies/ plans and activities undertaken**	**Source of Information**
ALIN	Arid and Semi-arid area Deals with information dissemination for Arid and Semi arid lands	Project: *Maarifa* centres in Kenya, Uganda and Tanzania	Sharing climate change adaptation interventions through field visits, demonstration plots, exchange group visits (e.g. sharing on tubular biogas in Nguruman, planting of cassava in Mutomo, planting of *Meila Volkensii* tree in Mutomo, water harvesting in Mutomo, Briquette making in Ndithwa and Mutomo). Promoting agriculture and livestock farming practices that are resilient in dry-land conditions by offering information on: improving livestock breeds, type of crops to crop under specific climatic conditions, by responding to extreme drought conditions in the arid areas Sending of early warning weather data to community groups through *Maarifa* centres and sms Linking community groups with experts such as extension workers, research officers (e.g. KARI officers demonstrating how to plant cassava – drought resistant crop, how to utilize the cutting and what specific cutting to look for) Capacity building and awareness on impact of climate change to community livelihood through trainings and workshops	Practical cases with different groups Internet Research organizations such as KARI MET department

Name of Organization	Focus area and Speciality	CC Project / components / target group	Nature of adaptation strategies/ plans /activities undertaken	Source of Information
ELCI	National wide: On-ground projects in western Kenya, Rift valley and Coastal regions in Kenya Deals with advocacy and environmental governance issues	Project: Climate change adaptation and women empowerment Coverage: Community groups in Kajiado district	Capacity building on climate issues and proving information and knowledge for adaptation. Responding to prolonged drought spells in Kajiado Facilitating development of adaptation livelihood activities such as construction of water tanks water pans, kitchen gardens, bee hives, Training community of livelihood diversification through holding workshops on micro-finance and business, building skills in production of honey and honey-related products (through value-addition), making and selling Maasai curios and marketing them	Up-scale from past projects (UNEP projects) Partnership with other organizations Newspaper articles, internet, reports on drought situation in Kajiado Observations of environmental conditions (cattle move from Kajiado and are taken to graze in Nairobi)
	National wide: On-ground projects in western Kenya, Rift valley and Coastal regions in Kenya Deals with advocacy and environmental governance issues	Project: Enhancing Community Environmental Stewardship Coverage: Tana delta region in Kenya	Capacity building on climate change, how it will affect the community and possible ways to adapt. Responding to increased drought events on livelihood and community	Past projects Experience Partnership with other organizations – Nature Kenya, Wild Living Resources, Wetlands international Newspaper articles, internet, reports
		Project: Desertification and livelihoods	Capacity building to reduce impact of desertification due to degradation Training on sustainable livelihood and farming techniques Training on application of sustainable farming technologies	Following world trends, Newspaper articles, internet, project reports, community feedback

Name of Organization	Focus area and Speciality	CC Project / components / target group	Nature of adaptation strategies/ plans /activities undertaken	Source of Information
KCCWG	National wide: Climate change advocacy, lobby and awareness	Project: County level climate hearings	Awareness and advocacy on climate change impacts to communities and livelihoods	Internet, IPCC reports Proceedings from CoPs Local communities Local CBOs
		Project: CRM, Strengthen the response of climate change at national and local level	Capacity building activities in 7 counties to strengthen knowledge, skills and awareness on climate change Strengthening capacity of county level actors to engage in adaptation and mitigation activities	Internet, IPCC reports Proceedings from CoPs Local communities Local CBOs

5.14 Conclusion on the three case studies

This chapter has highlighted findings from the three case studies; that is ALIN, ELCI and KCCWG. The findings show that these organizations all enact different adaptation practices. These adaptation practices are situated in different social contexts. These social context include; organizational mandate, community cultures and traditions, social networks and forums, partnership with other organizations research institutions and government departments and finally in donor interests. These different social context influences the type of adaptation practices that the organizations take up. In some cases, the elements of practices compete with each other in a given social context resulting in competing practices. Such as the case of KCCWG in which practices within social context defined through donor interests competed with those situated in the community traditions and cultures. The study showed that organizations do not develop adaptation practices in isolation but are enacted through their performance, this is defined by the experience the organization has, the social networks, partnership organizations such as extension departments that the organization associates with. These forums and networks enact knowledge and thus understanding of adaptation practices through sharing of new information, knowledge and competence, in this sense new meaning is created and adaptation practices are enacted. Findings also reveal that adaptation practices differ based on the social context in which practitioners are situated. This social context represent through culture, traditions, organizational mandate brings about variations of adaptation practice even those found within similar climatic areas. Similarly, organizations are aware of the elements that shape their adaptation practices. In some cases, organizations recognized the need to develop its competence, technical know-how in relation to climate information, to do this the organization arranged for training for staff members and in some cases partner with organizations that have these competences. Climate information is thus performed by enacting adaptation practices in a given location over time, this explains why adaptation practices in different locations (such as drylans of Kajiado vs. drylands of Mutomo) varied. Therefore the *situatedness* of the organizations in the different social context influences the adaptation practices they carry out and thus the type of climate information that is incorporated. Further, the competence the organization has or acquired (through partnership with other organizations) influences the type of climate information the organizations incorporates in its adaptation practices.

6.0 DISCUSSION

In this chapter, I discuss and reflect on my results while putting them in context of the wider literature in the field of climate change adaptation while reflecting on the theoretical framework. I will also reflect on the theoretical implication of applying the practice theory in my stud and finally I will end this chapter by reflecting on the methodology used in this study.

6.1 Reflections on the Results

6.1.1 Adaptation practices in Kenya

The three case studies presented show that different organizations carry out different adaptation practices, even those found within similar climatic conditions. This is because organizations draw upon different elements of material, meaning and competence to enact their adaptation practices. Often this relates to the social context in which these practitioners are situated. These adaptation practices are enacted through performance represented through understandings of climate situation and action to take to adapt to this situation. Adaptation practices are situated in practice (Bevir, 2005). This means that adaptation practices occur with different social contexts and these contexst vary. Findings from the study reveal that adaptation practices were influenced by the practitioner's social context; this context is defined by the organization's mandate, rules and regulation, the social network, community cultures and traditional practices of community members. According to Agrawal (2010), local institutions such as NGOs and CBOs, play a role in shaping how communities respond to impact of climate change, through initiating activities that seek to reduce the vulnerabilities of the communities to impacts of climate change (Agrawal, 2010). It is therefore important that the impacts and vulnerability to climate change be well understood. Organizations can therefore link climate change impacts and actions in practice by assisting communities to understand the implications of climate change on their livelihood.

This link is often made when community practitioners engage with the elements of practice situated in a social context. For example, in ALIN, adaptation practices related to drought in Mutomo, were enacted when farmers were able to share their knowledge on planting drought resistant varieties of cassava. This was possible as knowledge on cassava planting was transformed from written content to actual practice through training and field demonstration exercises. In a similar study, findings showed that adaptation practices at the community level can be achieved through learning by doing (Rojas Blanco, 2006). This involves community practitioners sharing their knowledge as well as incorporating local knowledge on adaptation from the communities. In this case, this involves community practitioners engaging in forums and social networks that expand their knowledge and information base, while at the same time making recognition of the social environment that being of the cultures and traditional practices that communities have and incorporating these two aspects into the broader adaptation practices. The performance of adaptation practice in space implied that different practices were enacted in different locations within a social context. This would explain why farming practices are enacted in highland regions and pastrolism practices enacted in the grassland regions.

As climate change is becoming a more relevant issue among the community practitioners across the world (Adger et al, 2005). In Kenya, the study revealed that there is a growing need to incorporate new knowledge of climate change in conservation and sustainable development issues. This in turn means that different adaptation practices take shape within the Kenyan context. The effects of climate change in Kenya are manifested through increased droughts, increase in the frequency and intensity of flooding and the intensity of vector borne diseases among other major climatic events (McSweeney et al, 2010a). This calls for informed and new approaches from practitioners in Kenya to respond to these impacts. Adaptation is therefore widely embraced by different practitioners by incorporating new knowledge and information on climate change to fit into the global climate debates. Adaptation practices have evolved over time, this evolution encompasses the practitioners' understanding of the vulnerability context, the social aspect surrounding and the community's capacity to adapt to impacts of climate change (Füssel, 2007; Adger et al., 2003). The results however reveal that the understanding of this context is influenced by the social context thus the culture, traditions, environmental conditions, social networks and forums that practitioners are situated. Further, results revealed that as organizations do not all the required competence and skills, they are often collaborate and partner with other organizations such as the case of ALIN collaborating with KARI and agriculture extension officers, this means that an organization's adaptation practices are therefore not developed in isolation but in the context of its social networks such through this partnership.

Adaptation practices do not occur in isolation but occur within the social and economic contexts of the communities (Agrawal, 2010). Findings from the study showed that adaptation practices were situated in the social context characterized by community traditions, cultures and social networks among others. The ability of communities to take up adaptation depends on their adaptive capacity and vulnerability status (Agrawal, 2010). In his findings, Agrawal (2010) classifies adaptation practices into five categories including mobility practices, storage, diversification, communal pooling and market exchange. The choice of communities incorporating practices within these categories largely depends on their social and economic status, the ecological conditions in which they are found, institutional arrangements, access to resources and power (Agrawal, 2010). There is ongoing debate on mainstreaming climate change practices into wider sustainable development activities. This is to imply that climate change is not just regarded as an isolated issue but one that affects other sectors such as the economy and peoples' livelihoods to name just two (UNDP-UNEP, 2011). Mainstreaming therefore implies that there is a clear link between climate change impacts and other sectors this link calls for incorporating new knowledge and information to bridge this gap. (UNDP-UNEP, 2011). Findings reveal that implementing adaptation practices was not only regarded as dealing with climate change but how climate change would affect livelihoods, the economy and other facets of human life and interaction. This called for community practitioners to incorporate new knowledge, develop new skills in order to create the link between climate change and other sectors. This implies that the links between climate change, adaptation and sustainable development are clear, thus adaptation action should fit into the wider development framework by not only understanding the climatic context in which adaptation addresses but also understanding the social background that includes institutions, social networks, market systems among others (UNDP-UNEP, 2011). Findings revealed that organizations developed new competences through partnering with other organizations, further developing adaptation practices in the context of community

needs, cultures and traditions took into account other factors such as their social and economic status and environmental conditions, in this way adaptation practices are mainstreamed into the development aspects of the communities.

According to Adger et al (2005) adaptation is aimed reducing the sensitivity of climatic events, shifting the exposure rate to climate change and building the adaptive capacity to cope with effects of climate change (Adger et al, 2005). The findings from this study were geared towards understanding how community practitioners in Kenya develop adaptation practices to assist communities cope with effects of climate change. The results reveal that the adaptation practices developed were more focussed on reducing the sensitivity of climatic events through implementing tangible projects as well as activities related to building the adaptive capacity through long term awareness projects. Practitioners took on different adaptation practices to meet these goals, that were defined by the social context in which practitioners were situated. These practices varied greatly among the practitioners, both short-term and long term adaptation practices were implemented. These include practices short-term practices such as destocking livestock on the onset of droughts or long-term practices aimed at building the local community's adaptive capacity on climate change (Awuor, 2009). Although the adaptation practice varied greatly among practitioners, they were also flexible enough to respond to new changes in the environment or climatic conditions. This mainly happened among short-term practices with farmers and pastoralist communities. This implied that adaptation practices that favoured these groups were mainly short-term and low-cost adaptation practices. For example practitioners at KCCWG adjusted their adaptation activities from advocacy activities to capacity building activities; this was in response to the social needs of the community and environmental factors. Practitioners shifted activities from creating awareness on impacts of climate change to training and practical initiating initiatives to give the pastoralist community skills in farming in respond to the harsh climatic conditions.

Climate change adaptation practices are performed through learning by doing (Rojas Blanco, 2006). By carrying out field demonstration and through field-exchange visits, ALIN was able to enact its adaptation practices related to knowledge sharing. Through the field demonstrations, farmers from other *Maarifa* centres developed competence in planting drought resistant crops such as cassava by taking part in the field-demonstrations, by so doing, these farmers gained practical knowledge to support them to diversify their livelihood and thus adapt to climate change impacts. Findings also reveals that practitioners develop their adaptation practices by incorporating knowledge gathered through social networks, forums and through partnership with government departments and research institutions such as KARI. Therefore, adaptation practices are not developed in isolation, but they take this knowledge into account. These networks allow for practitioners to exchange their knowledge and findings with one another thus learn from one another. For example ALIN works in collaboration with research scientist from KARI who support them in technical knowledge on good agronomic practices, similar, these good agronomic practices are interpreted and packaged by ALIN in an easy to understand formant and this information is disseminated to the community members often through practical field demonstrations or trainings. Through this interaction between practitioners and other scientists and social networks, information is exchanged, new knowledge developed, competences are enhanced and new meaning is developed.

FAO through its climate adaptation framework, recognizes that adaptation practices should be carried out in a specific context to relate to the climate vulnerability and social factors (FAO, 2011). This implies that adaptation practices are effective when they are integrated within the local context. The findings revealed that adaptation practices were situated in different the social contexts. These social contexts shaped the community needs, the adaptive capacity of the community, practitioners' technical capacity and access to resources. Practitioners developed their adaptation practices in respond to specific climatic events and within specific regions. Adger et al (2005) argues that adaptation is a continuous process that is embedded in institutional processes and links with individual cultures, economies, technologies within the social context. On-going adaptation practices in the study involved continuous awareness activities that related the adaptation activities to climate change. This was aimed at building the community's capacity on understanding climate change issues and how activities are evolving to incorporate climate change issues. For example, the drought-related activities carried out by ELCI evolved over the years to fit into the new cultures of the Maasai groups in Kajiado, where practitioners initiated agricultural adaptation practices to supplement the livelihood options of these pastoralist groups. Adger et al (2005) further argues that these adaptation practices are context specific, this implies that they cannot be similar due to different social setting and therefore the adaptation goals would vary within these contexts. This view relates with findings from the study that revealed that adaptation practices were carried out in defined social contexts. For example ALIN works with pastoralist communities in Kajiado to implement early warning alerts and encourage them to destock their livestock. On the other hand, ELCI works with different pastoralist communities in the same region in Kajiado, initiated agricultural and water conservation practices, including kitchen gardens, and construction of water tanks and water pans. The diversity of adaptation activities carried out within a similar region showed how different practitioners understood and related with climate change issues as well as the diversity of the community needs they were addressing. This is to imply that practitioners can be situated within the same social context however the adaptation practices carried out will vary and are influenced by other factors such as the organization's mandate and approach in which climate change issues are addressed, how practitioners relate with the community groups, practitioners understanding of climate change issues, traditional practices, technical competence of practitioners, organizational resources, human resources, tools and skills at the organization's disposal among others. This variation explains the different approaches that practitioners within KCCWG and ELCI took in implementing activities and it also shows that adaptation practices are situated in different social contexts. As adaptation practices are developed in different social contexts, this social context practices within these social context may be compete or collaborate with each other (Shove et al, 2012). For instance, ELCI's climate change project in Kajiado which aims at assisting Maasai women adapt to climate change by introducing activities that shift focus from the organizations core mandate in advocacy and lobby, to more of 'service delivery' such as construction of water tanks. Conducting these activities shifted the focus of the organizations from advocacy and lobby activities to more of service delivery activities. This collision within the social context may develop into new meaning emerging and thus new practices are developed. For example, as in the case of ELCI, new competence in capacity building was incorporated into its practices to support their advocacy practices in the implementation of the Kajiado climate change project. ELCI incorporated these competences by supporting the pastoralist community with new skills in farming and water conservation to address issues of drought. This represent the social context referred to by Adger et al

(2005) such as institutions, technologies, resources. In conclusion, practitioners should have a better understanding of the social settings in which the community groups are situated, this way practitioners are able to support adaptation practices that fit into these social settings as opposed to developing practices that require the community group to fit into. For instance, practitioners that promoted farming activities among pastoralist communities as opposed to creating adaptation activities that are in tune with the culture and social norms of these communities such as destocking of cattle, promoting high breed of cattle or promoting ways of preserving pasture.

Adaptation practices are not developed in isolation; they take into account other non-climate factors such as infrastructure, markets and social networks (Lu, 2009). Findings indicate that adaptation practices were not developed in isolation to responding to climatic situation but that development of adaptation practices gave regard to the social context in which practitioners were situated. This implies that adaptation practices are not blindly incorporated into existing practices but take cognition of the social contexts, social networks, forums and partnership with the practitioners. In this way adaptation practices cannot be simultaneously applied in different regions but rather they should be situated in the social context in which practitioners are found. The findings confirm what others have argued, that successful adaptation practices should not only link scientific findings with practical practices, but should reflect the social context that may include social norms and technologies (Morecroft, 2012).

In conclusion, the study identified that practitioners were situated in different social context. These social contexts defined the type of adaptation practices that practitioners carried out. Adaptation practices are enacted as elements are linked. This linking comes about as practitioners share the information and knowledge among the social networks and forums thus performing adaptation practices. Implementation of adaptation practices does not only mean conducting activities that respond to climate change or the climatic phenomena but it involves taking the social context into account and understanding the elements that enact adaptation practices.

6.1.2 The Role of climate information in climate change adaptation practices in Kenya

Climate change adaptation practices in developing countries has been noted to base the adaptation plans of historical climatic data and environmental conditions (Adger et al, 2003). This is attributed to their low adaptive capacity related to low resources (Adger et al, 2003). Findings reveal that practitioners developed and implement adaptation strategies basing on historical climatic data. Reference to climate information was often made in a generic manner with general consideration basing on outputs from past IPCC reports and often reference was made to historical climate data of general regions. A similar study carried out on application of climate scenarios in Africa found that there is a gap between development of climate change scenarios and its application for practitioners on the ground (Ziervogel & Zermoglio, 2009). The study showed that climate change scenarios in Africa have not been fully used in the development of adaptation strategies, rather reference is mainly made to general information derived from IPCC reports (Ziervogel & Zermoglio, 2009). The study attribute this to the lack of competence in understanding and interpreting climate change scenarios data (Ziervogel & Zermoglio, 2009). Competence is represented in the technical capacity of the practitioners to understand the technicality of climate models and to understand the relevance of these models in order to apply them directly into their adaptation practices, findings reveal that most practitioners preferred using the meteorological department to acquire seasonal data in form of

early warning systems, this was directly related to the limited (or lack of) competence in terms of technical skills in making use of climate data from GCM (General Circulation Model).

The term climate information may sound relatively new in climate studies but, this technology has been applied in the past through traditional methods of weather prediction (Ziervogel & Zermoglio, 2009). Traditionally, pastoralist communities were able to predict the weather up to four weeks in advance (Pratt, 2001). The evolution of the predictive science led to the development of scenario prediction and incorporation of different forms of climate information (Ziervogel & Zermoglio, 2009). Climate information was applied in different forms, although some forms were regarded more relevant to practitioners than others. The study showed that climate information from seasonality outlooks was more relevant and applicable to community practitioners as opposed to climate change scenarios. Similar results were found in a study that looked at applying climate change scenarios for adaptation practices in the agriculture sector in Africa (Ziervogel & Zermoglio, 2009). The choice of the application of one form of climate information over the other was determined by various factors, among them the relevance of that data to the community members and the applicability of the data. It was also noted that the technical capacity of practitioners to understand climate data, the available resources also proved to be a major factor in determining the type of climate information to use. A study conducted on the application of climate information for adaptation decision making revealed that the need to apply climate information will vary depending on the context of adaptation decisions (Lu, 2009). This is to imply that in some cases, there is little regard for applying climate information based on the level of decision making that one engages in. Findings from this study revealed that in most cases practitioners incorporated climate information to support local decisions at the ground level, such as when to plant or harvest, when to preserve pasture. This therefore implies that the type of climate information used such as seasonality data, early warning systems or indigenous and local climate data, was relevant to service decisions at this 'lower' level. This implies that the higher the level in decision making, the more advance type of climate information practitioners would incorporate. such as the case of KARI in which decisions were based on developing country level agronomic protocols or supporting a large group of farmers in Kenya adapt to impacts of climate change in their region, in this case climate change scenarios and downscaled GCM data was applied. As application of climate information was found to be situated in community traditions, this implies that practitioners incorporated 'local level' climate information that would fit into the community's traditional practices, such as the use of early warning systems as a modified version of traditional early warning systems.

Findings revealed that incorporating of climate information takes into account the social context in which adaptation practices are situated. In some cases this would mean combining social contexts. In the past, pastoralists had developed ways of predicting the weather by observing behaviour of animals or flowering of plants. This practice provided a guideline for the pastoralists to know when to act for example in the case of an impending drought (Pratt, 2001). Pastoralists are now combining traditional early warning system with modern scientific data such as from the metrological department (Awour, 2009). Other studies have also shown that communities are embracing the use of metrological data that is downscaled to provide a guide on the type of crops to plant or timings of agricultural activities (IISD, 2008). Practitioners have taken note of this and therefore are incorporating these two approaches in adaptation practices. Practitioners in this study interviewed

from Christian Aid indicated that they integrated these two approaches the traditional approach (the slaughtering of a goat) with the scientific approach (metrological data) to the develop adaptation strategies that are better accepted by the community, and incorporates the social context in which these practices are situated.

The results from the study also reveal that the type of climate information incorporated relates to adaptation practices that practitioners enact. This implies that short-term projects often resulted in incorporating of climate information form generic data such as IPCC reports, and in cases such as ALIN where the projects lasted for a little longer, practitioners would then invest in different types of climate information such as use of seasonality data. This is influence by the social context in which these practitioners are situated. Reports on the application of climate information in Africa highlighted in Joto Africa, indicates that farmers and pastoralists communities responded positively to applying short-terms data such as seasonal and monthly climate outlook data (Joto Africa, Issue 12, 2013). This data provided the community with information to make decisions on grazing patterns, planting seasons and practices and thus improved productivity 3 times more per unit area (Joto Africa, Issue 12, 2013).

In conclusion, the study revealed that practitioners incorporated climate information into their adaptation practices based on their *situatedness* and understanding of climate information. Application of climate information was not done in isolation but gave consideration to factors such as the community's traditional practices and the capacity of practitioners to apply climate information. Climate information was applied in the adaptation practices but the form of climate information applied varied. Different practitioners had different understandings of climate change and climate information and this showed by the type of climate information they incorporated. Therefore the social context in which practitioners were situated influenced the type of climate information it incorporates into its adaptation practices.

6.2 Theoretical reflection

The theory applied, practice theory, proved to be useful in understanding adaptation practices among community practitioners in Kenya. The combination of the concepts used through the conceptual framework was appropriate in understanding how practitioners develop adaptation practices and how they incorporate climate information into the practice of climate change adaptation.

The concept of situated agency (Bevir, 2005) was relevant in not only understanding the context in which practices are found but in also explaining why similar approaches offer different adaptation outcomes. Although this concept has not been fully and explicitly applied by Shove et al (2012), its use in this study emphasised the importance of looking at the context within which practitioners are situated.

Applying this concept has shed a different light to the study of adaptation practices. This concept of situated agency has been applied to bring to understanding that adaptation practices cannot be uniformly applied in different regions but they need to be situated in practice. This view implies that by studying how practices evolve and how adaptation practices emerge, one is able to understand how different elements are integrated to develop practices (Shove et al, 2012). This approach is of

particular interest to practitioners who are mandated to implement adaptation projects that are multi-sectoral and are integrated in sustainable development plans.

Through practice theory, this study has been able to focus on the elements that are integrated to enact practices (Shove et al 2012). Thus focus is drawn away from independently looking at frameworks such as institutions, discourse rules or even through actor-network collations, as these approaches are all integrated in the practice (Arts et al, 2013). Practice theory framework thus 'makes work easy' by allowing one to study these process/ frameworks as integrated in practices.

The application of practice theory in this study did present some slight methodological challenges in an attempt to meet the prescribed guideline set up by Arts et. al., (2013), this involved structuring the study to fit within a 'considerable long period of time'. Nonetheless, this challenge was overcome by confirming the data through a case-study approach and triangulation of the sources of data. One challenge that the study encountered in applying practice theory was grasping with the different approach to aspects of practices theory with no one unified approach in the practice theory (Schatzki, 2010). In this regard, consolidating various approaches to identify an applicable approach was a daunting task, more so when applying this to the wide field of forest and nature study in which this approach is fairly newly used as presented in by Arts et. al, (2013).

The concept of situated agency proved more practical and applicable than expected. One major contribution of applying this concept was to give an understanding of how social settings affect practices and how these shape the practices that practitioners take on. This has been demonstrated in this study (see Chapter 5) by exploring the different forms of climate information that practitioners within different social settings associated with and how they influenced the adaptation practices that were implemented.

In conclusion, by applying this theory, the study thus makes the following contributions to the theory and scientific literature on practice theory. Findings show that in taking the practice theory approach, to understand social change. It is important to explore and study the practices within practices. By doing this, one would get a deeper understanding of the general practices. Shove et al (2012) highlights this fact by showing that elements within practices can be integrated with different practices within general practice. The study was able identify several elements that make up the practices. This implies that by taking on the practice approach, one is able to look broadly into the different elements that are shaping practices.

The study identified that elements that make up a practice are either in completion or collaboration with each other with a social context (Shove et al, 2012) This situation thus implies that some practices have more dominance over others. For example, practices situated in community traditions compete with those situated in donor interests. This aspect can perhaps be best explained through a different lens such as relating practices with power through performativity (Arts et al, 2013). Similar suggestions have been made by Adler & Pouliot (2011) that suggest that practices have power and thus engaging in a practice enables one to exercise this power.

Finally, the application of Shove et al's (2012) perspective of practice theory (through integration of elements, i.e. material, meaning and competence) and performance taken together with Bevir' (2005) perspective on situated agency has been used to contribute to the conceptual framework of this

study. The combination of these perspectives has enabled the study to explain variation in practices within similar fields of practices. The inclusion of the concept of situated agency (Bevir, 2005) in the concepts of elements of material, meaning, competence and performance (Shove et al, 2012) demonstrates the value of viewing practices from different perspective. As the concept of situated agency is not explicitly illustrated in Shove et al's (2012) perspective of practices, this inclusion puts focus on the settings or the context in which practices are found (Bevir, 2005).

6.3 Reflection on methodology

The main methods used in the study were participatory observation and in-depth interviews. The study took a case study approach in order to maximize on the quality of data presented as opposed to quantity. This approach therefore meant that few organizations would be selected to participate in the study through locking out other potential organizations. The case study carried out was done to a bid to try to fulfil methodological requirements of a practice-based approach as described by Arts et al (2013). The study therefore narrowed down the case-studies to only three organizations, in which participatory observations could be carried out over relatively 'long' periods of time.

Due to limitation on time (2 months) the study could not consider all community practitioners in Kenya. Further, the study could also not consider community practitioner who were based out of Nairobi. Therefore the study chose to focus on community practitioners who were based in Nairobi as it was easy to access them. Participatory observation was conducted in the three organizations although during this time the researcher did not participate in any project implementation activities in the field (with the exception of one) and thus this mainly revolved around project planning and management. These was mainly due to low field activities at the time of collecting the data as most organizations reported they were in the process of winding up field activities and therefore were fully engrossed in project reporting and accounting. To make up for this, the researcher incorporated document and content review of past projects / project activities to supplement data from participatory observations and in-depth interviews.

Finally, the selection of key informants to contribute to the study proved challenging. Most key informants were pre-selected prior to going to the field however only about half of the pre-selected informants were able to take part in the research. This meant that the researcher had to select other informants to fill in the space of those who were inaccessible or declined to join the study. The snow-ball sampling method was then applied to recruit other informants. The selection process was challenging which led the study to shift its focus from the initial on conservation practitioners to community practitioners who carry out adaptation projects, these thus included development practitioners and faith-based organizations.

Overall, despite the challenges in collecting data, the adjusted methodology enabled the researcher to gather concrete information on climate adaptation practices in Kenya.

7.0 CONCLUSION

In this section, I present concluding remarks from the study; I do this by briefly discussing the background of the study and follow up by answering the research questions. Finally I will present recommendations based on the conclusions made.

7.1 Conclusion

This study was aimed at understanding the social context in which practitioners develop climate change adaptation practices and how climate information is performed in these adaptation practices in Kenya. To do this, I applied the concept of situated agency (Bevir, 2005) to understand the social context, the concepts of material, meaning, competence and performance (Shove et al, 2012) to understand the elements that make up adaptation practices and how they are linked.

A case study approach was selected in order to get a deeper understanding of climate change adaptation practices, through the use of a case study approach; I conducted participatory observation and 11 in-depth interviews with three community practitioners in Kenya. These practitioners were purposively selected and included: Arid Lands Information Network- ALIN, Environment Liaison Centre International –ELCI and Kenya Climate Change Working Group – KCCWG. To put the case study in the broader context I further interviewed twelve (12) community practitioners in Kenya who included local NGOs, research institutes and governmental departments, for these organizations a total of sixteen (16) in-depth interviews were conducted. This research was conducted between 26th August and 28th October 2013 in Nairobi, Kenya.

In this study, I understood a practice as the integration of elements of 'material, meaning and competence' that are linked together through their performance (Shove et al, 2012:22-5; Arts et al, 2013) and that these elements are situated in practice (Bevir, 2005). To get a deeper understanding of practices, it required one to understand the elements that compose these practices, how the linking together of these elements through their performance enact the practices and finally, how the practices are situated in the context in which they occur. For this reason, I operationalized material elements as objects, things, physical and bio-physical entities that make up the practice of climate change adaptation. Taken practically in the context of this study, this includes material elements such as technologies, animals, humans, financial resources, nature etc. Likewise competence in this study was taken to mean technical knowledge and skills, this includes the know-how, practical knowledge, understanding while meaning was taken to mean symbolic importance, goals and motives, this includes motivational knowledge and goals. The concept of performance in this study was taken to mean the 'active doings of a practice' that occur in time and space and are evaluated through understandings; these understandings are represented through sharing of information and experiences and best practices in a given social setting, this is done through social interactions such as community forums, networks and meetings. Whereas the concept of situated agency is in this study was taken to mean the social context in which practices are found. This social context includes traditions, rules, networks and nature.

To put this study into context, I understood an adaptation practice as any activities undertaken to help cope with or reduce the observed or/ and projected impacts of climate change on the

community, ecosystem or livelihood (IPCC, 2007). Therefore the adaptation practices that were the main focus of this study included the on-the-ground adaptation practices which are initiated by or facilitated by community practitioners, these practices were selected as they present 'tangible' outcome of adaptation work on-the-ground that is supported by local community practitioners through projects and programmes. Likewise, climate information in this study was taken as a collection of historical and future climate data. This data includes metrological data i.e. historical and future seasonality data, it also incorporates the observed historical weather events (rainfall, temperature etc), indigenous and local climate data and climate change scenarios. In other words, climate change adaptation and climate information as a practice incorporated elements of material, meaning and competence that were linked and situated in practice. Therefore this study incorporated concepts of material, meaning, competence, performance and situated agency to explain how climate change adaptation practices in Kenya were enacted.

7.2 Research questions

This section will provide answers to the research questions of the study.

Research question 1: What elements constitute climate change adaptation practices in Kenya and how are they integrated and linked?

To answer this research question, I applied the concepts of material, meaning and competence to explain how adaptation practices are enacted. Further, I applied the concept of performance in explaining how these elements are linked together through their performance and how this enacted climate change adaptation practices in Kenya.

Based on the research findings, climate change adaptation practices were enacted when practitioners integrated elements of material, meaning and competence. From the results these elements were taken to include material elements including physical structures such as the *Maarifa* centres, human resources, financial resources, humans through communities and their cultures, organizational mandate, tools such as technology, software as well as social networks such as networks and partnerships. Elements of competence were taken as technical-know-how in climate change, climate change science and information, skills in carrying out climate change adaptation practices. Elements of meaning were found to be structured through the project goals. These elements are linked together through performance of activities and represented through sharing of information and knowledge through social interactions. This implied that only by practitioners incorporating these elements together and acting upon them will they then be able to perform climate change adaptation practices. This was often through implementing of projects and programme such as conducting awareness activities, construction of water storage structures, field-demonstration and sharing of farming practices among others. The activities were also enacted when knowledge was shared among and between practitioners and the community. This knowledge was represented through interaction of practitioners in meetings and networks, partnership such as agricultural extension workers with NGOs, in national and international settings such as advocacy meetings, trainings among others. Knowledge between practitioners and community members was shared through field contact situations such as field demonstrations, trainings, workshops, *Maarifa* centres among others. Adaptation practices thus involved practitioners drawing on material, meaning and competence that

are relevant and accessible to the organization, working within the framework of organizational structures and mandates and actively implementing activities with community members. Adaptation practices thus supported the community's adaptive capacity through information and knowledge; providing skills and techniques to improve their livelihoods while educating the community on the impacts of climate change.

Therefore the elements that constitute climate change adaptation practices in Kenya include: organization's mandate, organizations competence, community traditions and culture, social networks, forums, partnership with organizations and institutions, traditional and indigenous climate knowledge, organizational resources (human and physical), donor interests and international climate forums.

These elements are linked through performance of adaptation activities by the sharing of information and knowledge through community forums, farmer-field schools, information centres such as *Maarifa* centres, through publication of climate information such as through Joto Africa, sharing of best practices and through partnership with government departments such as through extension workers

Research question 2: In what social context are climate change adaptation practices in Kenya situated?

To answer this question, I applied the concept of situated agency which explains the social context in which adaptation practices are found. Social context referred to traditions, rules, networks and nature, in which practitioners were situated. It is this social context that influenced the adaptation practices that were enacted.

Adaptation practices were found to be 'situated in practice'; by this I mean that practitioners based their adaptation practices on the social context in which they were found. This social context was often defined by organizational structures in which they were found; this included the mandate of the organization and how the organization carries out its projects. Through this, adaptation practices took this approach. For example, for ALIN the organization's mandate is in knowledge sharing therefore adaptation practices enacted were based on sharing knowledge with community members on different aspects from planting drought resistant crops to preservation of pasture.

Adaptation practices were also found to be situated in the community's traditions such the case of ALIN where adaptation practices initiated were based on the traditions of the pastoralists' communities they worked with in Kajiado and through this they initiated practices such as in hay preservation or cattle destocking practices. Further, adaptation practices were also situated in donor interests. This means that practitioners took into account developing projects that would most likely attract donor support and funding, such as the case of KCCWG in which adaptation practices with pastoralist communities were focussed on training pastoralist communities on farming techniques as a livelihood diversification activity.

The study also revealed that the social context in which adaptation practices are situated is influenced by both physical aspects such as climatic conditions and non-physical aspects such as

technology, market access, traditions, partnerships and networks that practitioners are situated in as well as government priorities. This means that adaptation practices do not only consider the climatic conditions but also take into account aspects shaping the social context. As practitioners can be situated in different social contexts such as through community traditions, donor interest, climatic conditions, technology, markets etc, the dominance of one social setting over the other varies. The social context in which practitioners were situated provided an answer as to why adaptation practices within similar climatic conditions varied. Therefore developing adaptation practices was not just based on responding to the climatic conditions but on understand the social context in which adaptation practices are situated.

Therefore climate change adaptation practices in Kenya are situated in community traditions and cultures, social networks, forums and partnerships, through donor interests, organizational mandate and structure, in government initiatives (KARI), environmental and climatic context and in social and economic structures (i.e. technologies, community livelihoods).

Research question 3: How is climate information performed in adaptation practices in Kenya?

Finally in answering the last research question, I applied the concept of performance to understand how climate information is performed in adaptation practices in Kenya.

Findings from this study reveal that practitioners are performed over time and within a given location. Adaptation practices incorporated different forms of climate information within a given location and over time. These forms of climate information influenced the adaptation practices that practitioners enacted. Findings also reveal that the different forms of climate information were represented through sharing of information and knowledge through social interactions that is the forums, meetings and networks.

Findings from the study reveal that practitioners used different forms of climate information including data form metrological department in form of seasonality data, historical climate records through technical reports, indigenous and local climate data and climate change scenarios. The choice of the type of climate information applied was based on the understanding of climate information that is influence through social interactions, organization mandate and competence influence through these interactions, networks and forums. For example ALIN used climate information relating to seasonality data, this was due to the community groups the organization works with such as small-scale farmers and pastoralist, for this group, such data was relevant for them to take adaptation measures. Further, ALIN worked in partnership with organizations such as the Kenya Metrological Department (KMD) and Kenya Agricultural Research Institute (KARI) and agriculture extension offers, through this partnership ALIN accessed seasonality data from KMD and work with KARI and agriculture extension officers to interpret and translate this data to the form that community members were able to use and apply for their adaptation practices. Application of climate information therefore was determined by the type of adaptation practices that were enacted.

Therefore climate information is performed over time and in a given location through sharing of information, knowledge and best practices through social networks, forums, publications, field experiences, international climate forums and partnerships.

In conclusion, findings from this study reveal that climate change adaptation practices in Kenya are enacted when elements of material, meaning and competence are integrated and linked through their performance and these practices are situated in practice.

7.3 Recommendations

The findings from the research present a way of understanding the climate change adaptation practices among select practitioners in Kenya. These results are used to provide further insight into adaptation practices and hence transferable in a similar social setting, however these results are not aimed in generalization for adaptation practices in Kenya. Based on the above conclusion, the study offers the following recommendations for practitioners and for further research in addressing gaps in climate change adaptation in Kenya:

7.3.1 Recommendations for practitioners

- Findings reveal that adaptation practitioners are not developed in isolation but through partnership with organizations, scientists and government departments. Practitioners should therefore develop networks and partnerships with like-minded organizations, scientists and government departments to support their adaptation practices. This partnership will enhance sharing and developing of skills and competence in application of climate information and thus robust adaptation practices are enacted.

- To understand climate change adaptation practices in Kenya, focus should not be on changing a practice because adaptation practices vary over time and in different context, rather focus should be on understanding the elements that constitute a practice and the social context in which practices are situated. Focus therefore should be in understanding what elements practitioners in Kenya engage with and why the specific elements are selected. By doing this, one is able to understand what does not work in an element and can instil change by working on the aspect of the element that does not work.

- To change how climate change adaptation practices happens in Kenya, it would require practitioners to take note of the type of climate information that is applied. For example this would mean that practitioners would not only rely on scientific climate data but integrate and incorporate local and indigenous climate data with scientific data to produce robust climate information. This implies that also material elements found within climate change scenarios can be reconfigured in such as way that they require less technical skills in understanding and incorporating this information in adaptation practices. This way, practitioners can widen their scope on climate information and not just focus on IPCC reports. Similarly, this may call for practitioners to partner with other practitioners who have the required competence in interpreting climate change scenarios and thus enhance their competence.

- Mainstreaming climate change adaptation into development planning would imply understanding what elements feature in more than one practice at a given time and in a given social setting. This implies that practices such as planting drought resistant crops such as cassava could be incorporated as into poverty eradication practices by understanding the similar elements in these two practices. Thus understanding the meaning associated with the practice.

7.3.2 Recommendations for further research

- The study showed that adaptation practices were situated in the social context in which they were found. The study also showed that this social context can incorporate various aspects such as cultures, traditions, technologies, donor interest among others. Findings also showed that some practices in a given social setting have dominance over others and thus results completion among practices. Further research is needed to understand this competition and thus dominance in practices, perhaps further research could incorporate the aspects of power through applying the concept of performativity (Arts et al, 2013) to understand this dominance.

- The study further recommends research to understand the logic of practices or logic in the actions of practitioners, this could explain why certain practices exist and why other die or even understand why certain practices are enacted instead of others. Perhaps this can be understood through apply the concept of logic of practice (Arts et al, 2013).

- The study showed how climate information was applied in adaptation practices, however the study did not go into further details to understand the challenges that may exist in incorporating different forms of climate information into adaptation practice. An interesting approach could also perhaps look at the challenges of integrating two forms of climate information such as through use of traditional local climate data and through use of seasonality data. Further research can therefore look at challenges of incorporating climate information in adaptation practices as well as the challenges of integrating two different forms of climate information.

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9.0 APPENDICES

9.1 Sample of Interview Guide

The following questions where used as a guide in conducting the interviews. This implies that these questions were not asked as interview questions but were asked in a bid to stir up discussions that were focussed on responding to the four research questions

Background information

Name of organization .....

Name of interviewee .....

Role in the organization.....

How long has the organization actively worked in climate change issues?.....

What is the main area of focus of the organization?.....

What is your main focus in relation to climate change work?.....

Do you work with community groups?.....

1.0 Research Question 1: Adaptation practices in Kenya

1. Briefly describe the programme/ projects in the organization, what is the 'mantra'/ mandate of the organization/ strategy of the organization

2. Briefly describe the programmes and projects in the organization, how do you come up with these projects, how do you come up with activities for the projects, what do you consider when developing these activities/ projects, are the projects independent or they link to other programmes? Are the activities contributing to a certain goal of the organization?

3. Briefly describe the team behind each project, how has this team supported the development of projects in your organization

4. What are the sources of funding in the organization? How do they affect/ influence project/programme development

5. Briefly describe the climate change activities you engage in currently and at what level (ie community, national, international), do these activities differ from the activities you carried out in the past if so how?

6. What are the sources of information / knowledge you refer to prior to developing your adaptation activities

7. Are there specific tools, objectives that you use/ apply when developing your activities / projects (could be hardware, software, assessment tools, baseline tools) how are these tools applied?

8. What climate change activities do you carry out? How do these activities contribute to the strategy / mandate of the organization, how are the activities/ projects selected or developed? To what extent do they infer the climatic conditions/ ground observations. Do you receive any support (technical, financial etc) from the government related to climate change activities if so what and how?

9. Have you changed your activities over time and if so what was the basis of the change and why?

2.0 Research question 2: Social context in which practices are situated

1. What are the major factors that influence the approach you take in your climate change projects
2. To what extent does your social settings influence the approach you take in climate change adaptation
3. Kenya has developed the NCCRS and currently the Action plan, to what extent does this plan play a role as a guide for your organization to develop climate change activities/ plans,
4. Does your organization have a climate change strategy? If so, what are the key highlights from the strategy over what time-scale does this strategy operate? What informs the strategy
5. Describe the community group(s) you work with, how do they affect/ influence your adaptation activities
6. To what extent does your organizational mandate influence the approach / activities you carry out
7. To what extent do you base your activities on donor interest/ requirements vs your approach

3.0 research question 3: Climate information performed in adaptation

1. What are the main sources of climate data for your project? What type of data do you incorporate? Where would you generally access your information from? Describe the process of accessing this information
2. To what extent do you make use of past climatic data from MET department or future scenarios, or general climate data such as IPCC report, in your activities
3. (Interviewer to describe climate information based on study definition,) In what ways do you find the climate information useful to your organization when developing your adaptation plans, What are some of the outcomes from climate information that you find most useful and why? (eg seasonal forecast data, scenario predictions?
4. In which time scale is you comfortable to use when accessing this information and why? e.g. yearly, seasonally, decades etc? (Does it relate with any requirements e.g. donor funding, strategic plans?)

5. To what extent do you think the climate information you use gives you an understanding of climate impacts, vulnerability and expected outcomes that help you develop your adaptation practices
6. When developing funding proposals for climate change adaptation work, what are the main sources of information you rely on?
7. What consideration do you give to new information when developing your climate adaptation activities / plans?
8. To what extent is the content from climate information used in decision making and in making management decisions?
9. What additional information may you require to help you plan your climate activities properly within a longer time scale
10. What role should climate information play in regards to climate change adaptation practices
11. Do you make any adjustments to your activities when new information comes in?
12. What additional information (if any) on climate change do you require to make more strategic decisions to e.g. in a 5 or 10 year time scale?
13. To what extent have you made any modifications to the activities you carry out with the community on climate adaptation, your plans or practices due to outcomes of climate change as revealed in climate scenarios?

Any other comments you would like to discuss