

**Can an integrated participatory approach to disaster risk reduction  
effectively address the issue of livelihood resilience?**



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**MA/MSc DISSERTATION**

I, Gillian Logie hereby declare (a) that this Dissertation is my own original work and that all source material used is acknowledged therein; (b) that it has been specially prepared for a degree of the University of London; and (c) that it does not contain any material that has been or will be submitted to the Examiners of this or any other university, or any material that has been or will be submitted for any other examination.

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## **Abstract**

This research provides a case study of the use of an integrated participatory approach to establish conditions for livelihood resilience in Goro Gutu, Ethiopia. A qualitative approach was used to understand perceptions and practices of community members, government and non-governmental facilitators. Results indicate that whilst the approach is valuable in engaging previously isolated communities, misunderstandings of the approach itself may undermine risk reduction actions taken to address livelihood resilience. This study argues that further training on the concepts and best practices is required to improve the sustainability of risk reduction measures.

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## Abbreviations

CCA	Climate change adaptation
CPA	Community Participatory approach
DAs	Development Agents
DRR	Disaster Risk Reduction
EMR	Ecosystem Management And Restoration
ERCS	Ethiopian Red Cross Society
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Country
MYC	Maximum Yield Crops
NLRC	Netherlands Red Cross
PfR	Partners for Resilience
SESs	Socio-Ecological Systems
UNFCCC	United Nations Framework Convention on Climate Change

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## 1.Introduction

This research aims to provide a situational analysis of the integration of disaster risk reduction, climate change adaptation and ecosystem management and restoration into a participatory tool aimed at establishing conditions for livelihood resilience. Furthermore, the project will answer the call for additional case studies on socio-ecological systems to broaden the literature in this under-researched area (Berkes and Seixas 2005; Carpenter *et al.* 2005).

Research within the social and natural sciences have demonstrated the interconnectedness of humans and the environment (Anderies *et al.* 2006). In light of the projected increases in the frequency and magnitude of extreme weather events (IPCC 2007), the ability to absorb and recover from climatic disaster events will be more challenging. It is therefore imperative to adopt a holistic approach to reducing the impacts of these events on populations and the ecosystems on which their survival depend (Allison and Hobbs 2004). For East Africa, forecasts show that drought and food insecurity are likely to be of increasing concern, (Park Williams and Funk 2011) which makes conducting this research in Ethiopia, where rural livelihoods are dependent on land and agriculture, particularly valuable.

The community participatory approach has long been established as a means to access populations at risk and implement development goals (Chambers 1994a). For developing countries that have utilised this tool, disaster risk reduction and climate change adaptation concerns have been addressed usually with an element of ecosystem management and restoration involved. Strategy integration is important because developing nations are disproportionately affected by extreme events given their high dependency on local ecosystems (Georgieva 2012; Zahran *et al.* 2008).

However, the integration of all three strategies has been uncommon. In agreement with Cumming *et al.* (2005), it is the position of this paper that to establish conditions for livelihood resilience, an integrated approach is required to ensure that population and ecosystem needs are balanced.

The literature on socio-ecological systems emphasises the linkages between populations and their environments. It argues that to provide security of goods and services for dependent peoples it is essential to balance both human and ecosystem needs. Building on this, Gunderson (2000) argues that if both are considered by planners and policy-makers there is the potential to reduce disaster risk.

### Structure

Following a review of current socio-ecological system literature (chapter 2) and presenting the project in this context, the research questions will be introduced. A contextual background justifying the choice of Goro Gutu, Ethiopia as a research location is then provided in chapter 3. The methodology of this project will be presented in chapter 4 followed by the analysis (chapter 5) and discussion (chapter 6) of the research results before final conclusions are drawn.

## 2. Literature Review

The purpose of this chapter is to: i) introduce the concept of resilience ii) outline the theory of resilience in Socio-Ecological Systems iii) discuss the issue to which the theory shall be applied and iv) present the research questions.

### Analytical Framework

Resilience in Socio-Ecological Systems (SESs) is multifaceted. Therefore it is difficult to simplify into a concise definition. However, a generally accepted definition from the work of Walker *et al.* (2004) is:

*“Resilience is the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks” (p.2).*

To expand on this definition, the following provides a fuller discussion of SES resilience as exhibited in the literature.

### 2.1 Resilience of what to what?

Within a SES there are multiple threats from which an entity may desire to be resilient. There are also times where resilience is more of a hindrance to survival as in Maru’s (2010) work on the ‘poverty trap’. Critical to the discussion is “resilience of what to what” (Walker *et al.* 2002 (6:1) article 14).

#### 2.1.1 Social Sphere

In the social sphere, resilience is a desirable state where it promotes the reduction of vulnerability (Birkmann 2005). Rooted in disaster literature, resilience is slowly emerging to have “actor orientated, place-focused, and context-specific” applications giving it a more local-level focus (Marschke and Berkes 2006 p.42). In a move from traditional analyses of disasters as physical events, it is now widely held that disasters are socially constructed and not ‘natural’ as popular terminology indicates (Bull-Kamanga *et al.* 2003; Cutter 1996). Furthermore, it is regarded as an approach to be pursued before a disaster occurs in order to reduce risk. Thus resilience can be seen as a disaster risk reduction (DRR) measure. The

aim of this preparatory approach is to “create conditions that make coping unnecessary and resilience more than a return to vulnerability” (Cannon 2008 p.1). That conditions can be ‘created’ is an indication of Cannon’s collaborative work into ‘social causation’ of disasters, personified in the ‘Pressure and Release Model’ (Wisner *et al.* 2004) that outlines their highly regarded five components of vulnerability. Of these, livelihood resilience is the fundamental factor to which all others are tied. Therefore, in this context, it is the resilience *of people to* natural hazards that is the primary concern.

### 2.1.2 Ecological Sphere

Ecosystem degradation is a critical issue in modern times. Ecosystem health and survival is dependent on multiple interacting and cross-purpose factors. Ecosystems are complex systems fundamental to the life of their inhabiting species as well as local human populations. Anthropogenic activities and climate variations are having, and will have, substantial impacts on ecosystem health with some systems currently considered beyond repair (Anderies *et al.* 2004; Harris *et al.* 2006). Whilst some anthropogenic actions have resulted in climate change, climate variations are part of the natural cycle (Ghil 2002). Therefore, care must be taken in appropriating responsibility for climatic impacts to solely humanity or nature. In this context the vulnerability of the system is both socially and naturally constructed.

Heller and Zavaleta (2009) and Maru (2010) serve a reminder that in such complex systems there are multiple stable states that each component can occupy. Therefore resilience may be present in one part of the system but not another. From Perrow’s work (1984) on complex systems it is understood that resilience or lack of resilience in one system component impacts on other components in tightly coupled systems. Although the work was conducted in technology dependent industries, the lessons are transferable. In this case it is the resilience *of the ecosystem to* anthropogenic exploits and climate variations that is of concern.

## 2.2 Resilience Theory in SESs

Resilience theory is an innovative approach designed to address socio-ecological systems. Originating in work of theoretical ecologist C.S. Holling (1973), it recognises that:

*“Natural resource problems are not isolated scientific or technical problems, but are rooted in human failure to understand the links between social, ecological, and economic systems”* (Allison and Hobbs 2004 (9:1) Article 3)

### 2.2.1 Consensus within SES literature

#### *Multidisciplinary approach*

Resilience theory incorporates aspects of several pre-existing schools of thought in order to create an approach that applies to SESs. Development of ideas from systems, general systems, complexity, and normal accident theories have contributed to a holistic approach to SESs that acknowledges the importance of the tightly coupled and cross-disciplinary nature of the systems (Allison and Hobbs 2004, Walker *et al.* 2002).

Definitions of resilience vary but at their core is the retention of identity in the face of stress (Berkes and Seixas 2005). Identity is retained by ensuring that relationships between system components are maintained through time and space and that they are able to evolve and self-organise in a beneficial manner (Peterson *et al.* 1998; Cumming *et al.* 2005). Humans, ecosystems, and climate are three contributors to these relationships. Manners and functions within their own communities and between these communities fluctuate over time and space thus Anderies *et al.* (2006) warn it is impossible to manage system facets in isolation. Given that it is from ecosystems that goods and services essential to humankind are extracted, Munang *et al.* (2011) and Higgs (1997) argue that an ecosystem based approach that incorporates both anthropogenic and climate concerns is likely to result in optimum conditions for SESs i.e. reduction of disaster risk and ecosystem degradation, and resilience in the face of climate change.

### *Strong institutions*

In their five steps to building resilience, Berkes and Seixas (2005) argue that the establishment of strong institutions is fundamental to success in this endeavour. Cumming *et al.* (2005) add that the ability to monitor and maintain the identity of an SES can only be achieved through the active involvement of stakeholders. The aim is not the continuation of the status quo but to allow fluctuations in the system without the loss of overall identity. For this, strong stakeholder involvement is required to allow for such subjective decision making (Carpenter *et al.* 2005). The absence of strong institutions would severely hamper this process (Ostrom in Gunderson 2000). Although there is general consensus as to the importance of institutions to successful resilience, Anderies *et al.* (2004) argue there is a deficiency in existing research as to *how* institutions can best contribute to the resilience goal and call for greater attention to be paid to this facet. Mustafa (1998) argues, in his work on Pakistan's floods, that institutions should additionally be sympathetic. Therefore, it is not enough to be strong; institutions must also make resilience their priority.

### *Conditions for creativeness*

"A social system that rewards innovation can be robust to many external shocks, as long as it innovates quickly enough" (Anderies *et al.* 2004 9:1). Given that there is no manual to guide resilience measures (Carpenter *et al.* 2005) and that surprises are inevitable in complex systems, active learning is essential to pre-empt and react to changes (Gunderson 2000). Cumming *et al.* (2005) add that there is great value in developing insights and understandings as systems adapt and change. Taking this further, Allison and Hobbs (2004) argue that creativeness and innovation can prevent rigidity in the system that can lead to inflexibility and 'bad' resilience.

### *Exchange of knowledge and experiences*

Within SESs literature there is significant consensus regarding knowledge sharing. Anderies *et al.* (2006) describes the management of SESs as more of an art than a science. Inherent in this is the fact that neither ecosystems nor social systems can be managed in isolation: it is therefore imperative for actors from all scales and

disciplines to combine knowledge for optimum results (Walker *et al.* 2006; Berkes and Seixas 2005; Gunderson 2000; Carpenter *et al.* 2005). To ensure legitimacy and conditions for success, Anderies *et al.* (2004) assert that local experiences are essential in the resilience process. They argue that the practicality of decisions made will be negatively affected if the livelihoods and survivability of local populations are not considered. Building on this idea of scale, Cumming *et al.* (2005) contend that interaction between local, national and international are essential. They claim that whilst local stakeholders can identify issues of concern, expertise upscale can be necessary for effective decision making, for example, the construction and dissemination of climate change data.

### *Self-organisation*

The ability of the system to self-organise is crucial in the development of resilience (Berkes and Seixas 2005). Self-organisation is the interface between structures and process in the system, which includes management. In a discussion of Holling's work, Walker *et al.* (2002) assert that self-organisation minimises the inputs required from outside management. This allows the system to develop a natural robustness as there are fewer imposed system feedbacks. Walker *et al.* (2004) explain that if management interventions are necessary, any negative side-effects can be offset by this robustness. The advantage lies in less need for subsidies and outside interference that can prove detrimental to SESs as there are often pre-conditions attached to these that can result in inflexibility (Anderies 2006).

### 2.2.2 Limitations of the Theory

#### *Practical application*

Given the range of shocks, and varying intensities and frequencies at which SESs can be exposed to them, a great deal of empirical data is required in order to provide any reliable assessments of how systems are likely to change or otherwise (Anderies *et al.* 2006). Gunderson (2000) advocates active learning to address current and emerging issues. For Anderies *et al.* (2006), it is essential to understand, even broadly, the relationship between process and feedbacks and

they argue that, at present, data deficiency is preventing valuable lessons being learned.

Furthermore, as SESs are an interaction between humans and their environments the patterns and functions vary depending on the unique needs and interests of those involved. Carpenter *et al.* (2005) point to the context-specific nature of SESs and advise that effective resilience approaches are required to be flexible with a number of contingency scenarios in reserve. In the same vein, Walker *et al.* (2002) warn that the interests of parties (including markets) are competing and experience temporal and spatial variations. As a result, resilience measures must be malleable to the extent that they continue to operate as change takes place.

### *Known unknowns*

Several factors that serve to disturb SESs are known across actor scales. The preparedness of SESs and their reactions to them however are not (Allison and Hobbs 2004). Cumming *et al.* (2005 p.984) do assert however that

*“It is difficult, but not impossible, to assign likelihoods to different scenarios; or at least to assess the likelihoods of some of the more important changes”*

These projections would provide options for mitigation measures, though there is no guarantee that events will unfold in the manner in which there are forecast. Walker *et al.* (2006), in discussion of livelihoods, argues that human-ecosystem interaction is difficult to research and hypothesise as it is inappropriate to request that people submit themselves and their livelihoods for academic experimentation.

### *Human dominance*

SES resilience is heavily reliant on the interactions of humans with their ecosystem. As the SES concept is rooted in ecology there is a deficit in information on the human element (Allison and Hobbs 2004). For policy and actions regarding SESs to be legitimate and implemented efficiently it is necessary to consider the needs of ecosystem users (Walker *et al.* 2002). Livelihoods and survival draw heavily on ecosystem goods and services, particularly in rural areas, making trade-offs inevitable (Anderies *et al.* 2006). These trade-offs vary temporally and



spatially depending on local conditions and economics (Cumming *et al.* 2005; Walker *et al.* 2006). The motivation to protect particular features of an ecosystem will also vary depending on industry and survival requirements (Anderies *et al.* 2004). It is imperative to remember that human need will inevitably dominate environmental health, particularly in financially-strained regions and therefore public consultation is essential when managing SESs (Anderies *et al.* 2004).

## 2.3 The Problem:

*Uncovering conditions for livelihood resilience within an SES using an integrated community participation approach.*

This chapter will consider the conceptual variables of importance to this study. These include livelihood resilience and community participation.

### 2.3.1 Livelihood Resilience

A resilient or sustainable livelihood is one that can:

“cope with and recover from stresses and shock, maintain or enhance its capabilities, assets and entitlements, while not undermining the natural resource base” (Marschke and Berkes 2006 11:1)

Livelihoods act as “the first line of defence” (Cannon 2008 p.4) in times of crisis. Given the interrelated nature of SESs, the ability to secure a sustainable and resilient livelihood is intrinsically bound to the environment in which that livelihood exists (Sallu *et al.* 2010; Moench 2007). Marschke and Berkes (2006) warn that a factor that enhances a livelihood may prove detrimental to the health and resilience of the ecosystem with which it interacts. They further argue that measures addressing the sustainability of these systems must treat conservation and livelihood considerations as part of the same agenda; one cannot be separated from the other if the needs of the poorest in society are to be met whilst the ecosystem is managed in the most effective fashion. For SESs resilience to be developed key concerns of livelihoods must be addressed. Inevitably there will be trade-offs particularly in rural regions where survival is tentative (Anderies *et al.* 2006). The establishment of livelihood resilience conditions is therefore intrinsically bound with ecosystem resilience.

### 2.3.2 What is Community Participation?

Community participatory approaches (CPA) employ a suite of methods to allow for grassroots voices to be heard on a wide range of topics (Pelling 2007). Participation has grown out of increasing dissatisfaction with the traditional high-cost questionnaire approach which was seen as extractive and top-down in nature (Chambers 1994b). It is the partnership between those within and outwith communities that facilitate knowledge transfers and the planning and implementation of improvement actions developed by local people for locally identified issues (Seifer and Calleson 2004; Chambers 1994a). Sadik and Rahman (2009) add that participation is a means to identify policy avenues and bridge the gap between academics and local communities. This allows for context-specific livelihood adaptation and resilience measures to be formulated. Whilst a popular method within the development sector:

*“community participation is one of the most overused, but least understood concepts in developing countries without a serious attempt to critically analyze the different forms that participation could take” (Botes and van Rensburg 2000 p.41).*

#### 2.3.2.1 Strengths

##### *Empowerment*

Pelling (2007) argues that CPA, if handled correctly, has the potential to be emancipatory in nature. Expanding on this, Chambers (1994c) observes that participation allows for lateral thinking. This can encourage participants to take responsibility from outsiders and triangulate their knowledge. In this way techniques suitable to those involved are used (for example, the use of visual materials in an illiterate community) to maximise contributions and prompt innovative outcomes (Chambers 1994b). The potential of the approach is to develop self-confidence and give local people the tools required to organise, create, and adapt measures unique to their locality and needs in order to achieve self-identified goal such as vulnerability reduction and increased stability.

### *Social Capital*

The “social energy” (Chambers 1994c p.1449) that can be created through participation may strengthen the social capital of those involved. Chambers continues that the popularity of the method can encourage a variety of people across the social sphere to become involved (Chambers 1994c). This in turn may lead to expanded social networks. Enshrined in the Hyogo Framework is the call for community and local government to possess the resources and capacity to implement actions required to reduce risk in their area (ISDR 2007). In this way, local institutions become a familiar part of community life and strengthen relations between local politicians and the people they serve.

### *Legitimacy*

Common to all literature regarding community participation is the need for legitimacy to be established in order for measures to be sustainable (Taylor 2007; Curtis and Lockwood 2010). Chambers (1994b) employs the metaphor of ‘handing over the stick’ to demonstrate that outsiders must be mere facilitators of the process with responsibility for project planning, implementation, and evaluation residing with the community. Participation allows for cultural and spatial conditions to be taken into account which provides for tailor-made solutions to be created (Curtis and Lockwood 2010). Botes and van Rensburg (2000) further argue that the likelihood of success of a project is one in which community, especially leaders, are involved from the outset. It follows that a common-made plan for a commonly-identified problem is more likely to result in community monitoring than a top-down enforced measure.

#### *2.3.2.2 Challenges*

##### *‘Community’*

The scope of ‘community’ is difficult to define: for some, community is a spatial concept, for others it is the group of people who are to be involved in a task (Cannon 2008). Scholars and practitioners are increasingly uncomfortable with the ‘romanticised’ view of community (Pelling 2007; Botes and van Rensburg 2000). They argue communities are not homogenous entities working for the benefit of the entire group. Indeed, power struggles within a community can be more

pronounced when resources are scarce. Although acceptance of an outside-initiated project is generally more accepted when community leaders are on board, Cannon (2008) points to cases where elites have been reluctant or refused to work with vulnerable people, which consequently reinforced their vulnerable status. A community may be a place or group of people but it does not necessarily follow that the community will cooperate or have similar expectations.

### *Integration of concepts*

For many years climate change adaptation (CCA) and DRR have been addressed as separate issues, separate projects and separately funded (Schipper and Pelling 2006; Schipper 2009). Despite the overlaps in these approaches it is only recently that the call for integration has begun to be heard. While the results of DRR measures are generally tangible and therefore widely understood, CCA poses a great challenge in understanding (Mercer 2010; Miller *et al.* 2007). Whilst climate science and knowledge is available at the government level through the work of the UNFCCC and the IPCC, on-the-ground efforts are decidedly more problematic. Changes in weather patterns is a popular method of relating climate change, however, adaptation remains challenging (Byg and Salick 2009). The fact that community efforts cannot directly improve the local climate can make the need for adaptation difficult to relate.

As with DRR, ecosystem management and restoration (EMR) is a tangible concept. The health of the systems is felt keenly, as a large proportion of the world's population are dependent on ecosystems for livelihoods and survival (WHO 2005). However, whilst ecosystems are dependent on climate and are of great importance the event and prevention of disasters, widespread integration of actions in this field with DRR and CCA measures has yet to occur (Mercer 2010).

### *Hard-Issue Bias*

Often development projects favour 'hardware' (technical, financial, material) to 'software' (social interventions) solutions. This is particularly true in regards to the environment (Botes and van Rensburg 2000; Hulme 2005). Recently, natural scientists have been calling for collaboration with social scientists given the impacts of complex socio-ecological interactions (Adger *et al.* 2005). Hardware

produces tangible outcomes thus there is a feeling that ‘something has been done’. Software is time-consuming, slow, and can be difficult to manage in comparison (Botes and van Rensburg 2000). In order to ensure that the mind-set of a community is tuned to the real risks they face it is essential that solutions utilise both the hard and soft science expertise on offer in a way that addresses community-identified needs.

### 2.3.3 Innovation of this research

On a practical level this integrated approach is novel. Documentation is scarce and evaluative procedures are in their infancy. For lessons to be learned and best practice to be established analytical research on such projects is essential.

This research will focus on conditions for building livelihood resilience in a socio-ecological system. As such it answers the call for data regarding human interactions with their environment as made by Walker *et al.* (2006) and Allison and Hobbs (2004). It will also contribute to the initial evaluations of the integrated DRR, CCA and EMR approach and will be a source of reference in discussions regarding next steps.

In answering the call for additional SES case studies to further develop understanding in this field the following research questions have been developed:

1. What steps have been taken to integrate disaster risk reduction, climate change adaptation and ecosystem management and restoration in a community setting?
2. In what ways have livelihood vulnerabilities been addressed through a participatory approach?
3. What is the impact of the role of facilitator?

NOTE: In the context of this research *Facilitator* is used to describe persons engaged in conducting community projects both governmental and non-governmental; *Community* is used to describe a group of people living in the same geographical area.

### 3. Context

This section introduces the research site and justifies the selection of Goro Gutu for research. Furthermore, it gives a brief insight into Ethiopia's experience with disasters and the work of international organisations to reduce the population's vulnerability to these events.

#### Disasters in Ethiopia

Ethiopia is classified as a Least Developed Country (LDC) by the UNFCCC (Tadege 2007). As such, it is particularly susceptible to disasters given the relatively low capacity to resist and recover (Tadege 2007). Increasingly, the country's exploitative relationship with the environment has exacerbated its exposure to disasters with drought, food insecurity and flooding impacts being recurrent hazards (Bishaw 2001).

In conjunction with the UNFCCC, Ethiopia has identified the causes of its vulnerability to disasters. Dependency on rain-fed agriculture, under-development of resources and infrastructure and low economic development both locally and nationally, have detrimentally impacted the capacity to resist and recover (Tadege 2007).

Recently, the Ethiopian government has introduced its 'Green Economy' strategy that integrates sustainability goals into development plans, which include reducing emissions, improving agricultural practices and combating deforestation and degradation (Federal Republic of Ethiopia 2011). It also supports community based efforts as they are viewed as sustainable actions (The Ethiopian Herald 2012). This is an indication of a deliberate shift from exploitation to conservation aligning government thinking with that of the international community and with agencies working on development projects within the country.

#### Partners for Resilience in Ethiopia

'Partners for Resilience' (PfR) is a partnership between international five agencies, including the Ethiopian and Netherlands Red Cross Societies. Partners are active within Ethiopia though their involvement in individual projects varies depending on the expertise required. Their mission is to reduce vulnerability by developing

community capacity in the face of disaster, climate change and ecosystem degradation (NLRC 2010). Operating at the community level, a key strategy is the strengthening and diversification of livelihoods. Livelihoods play a critical role in ability of people to resist and recover from disasters (Cannon 2008). PfR seeks to place control in the hands of the community by facilitating training for community members and local government officers alike to allow assessments and strategies to be self-conducted (Cannon 2008).

### Research site: Goro Gutu

The Woreda of Goro Gutu lies within the Oromia region east of the Ethiopian capital Addis Ababa (see Maps 1 and 2). The Woreda is a large remote area between Harar and Dire Dawa comprising of 19 Kabele's (districts). Three Kabeles were chosen for research; Medisa Jalala, Yeka Umema Tokuma, and Yeka Jalala. Table 3a depicts the general organisational structure of Goro Gutu Kabele's committees.

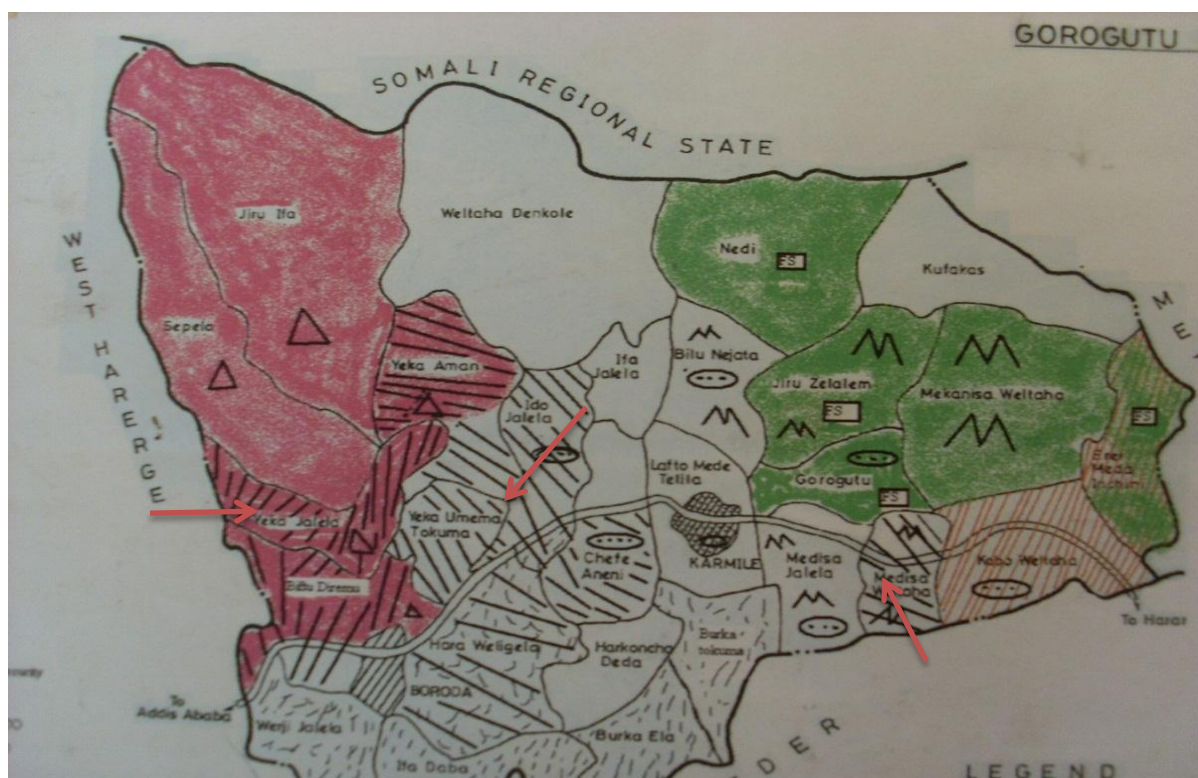
*Map 1: Goro Gutu in relation to Addis Ababa*



(Source: Google earth)



Map 2: Kabele research sites in Goro Gutu (indicated by red arrows)



(Source: author's picture of ERCS officer's map, personal communication)

Table 3a: General organisational structure of Kabele committee

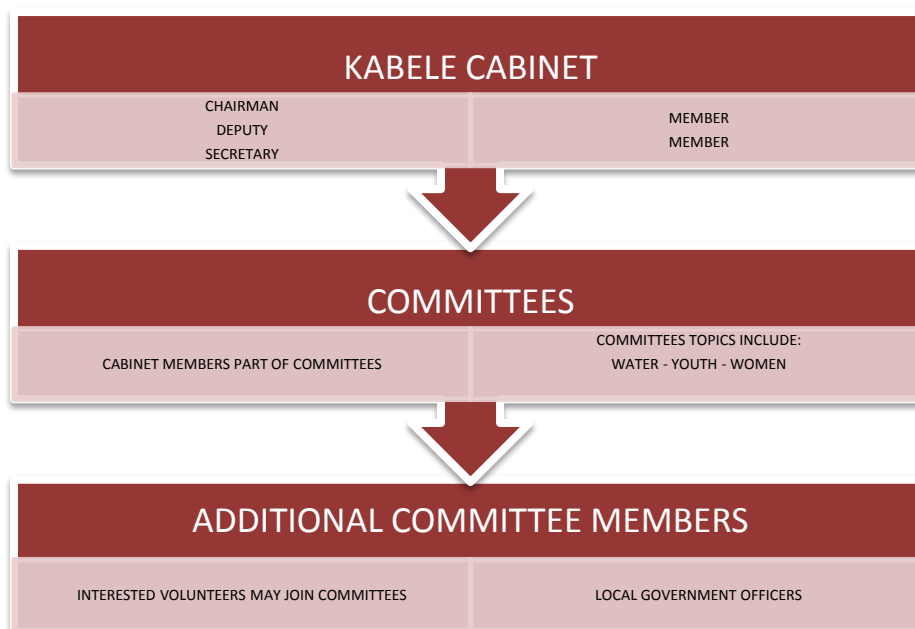


Table 3.a: Kabele Structure. (Source author's own, personal communication with ERCS project officer)

Goro Gutu is a region at high risk of drought and food insecurity (Tadele and Ayalew 2010). Hazards are exacerbated by ecosystem degradation as a result of



both anthropogenic interference and climate change (Tadege 2007). The Woreda was initially identified by the Ethiopian government as a region requiring immediate intervention. Kabeles deemed at high risk were documented and The Ethiopian Red Cross Society (ERCS), with funding from the Netherlands Red Cross (NLRC), initiated two-year projects in two of these Kabele's. At the end of this period, an extension of two years was granted and two more Kabele's were included in the project; sites were chosen on the basis of accessibility and need. Of the aforementioned Kabele research sites, Medisa Jalala was included in the first round of the project whilst Yeka Umema Tokuma and Yeka Jalala are the two recently added sites.

### Selecting Goro Gutu

The project being conducted by the ERCS in Goro Gutu is innovative for the region and for the ERCS itself. It seeks to integrate the principles of disaster risk reduction, climate change adaptation, and ecosystem management and restoration with the goal of reducing vulnerability by developing community resilience. The first round of the project was completed and evaluated in 2010. This research can therefore consider whether adaptive measures have been implemented based on the recommendations of the 2010 evaluators in both an original Kabele site and the newly identified sites.

The research also afforded the opportunity to be hosted by the ERCS and thus gain access to a remote rural region that is not often accessed by non-Ethiopians. Whilst access to the main town, Karamille, is possible due to a paved highway, navigating the often treacherous rural roads required experienced drivers and ERCS staff.

## 4. Methodology

Four weeks were spent in Ethiopia collecting field data. The trip was hosted by the Ethiopian Red Cross Society (ERCS) and facilitated by the Red Cross/Red Crescent Climate Centre. Fifteen days were spent in the eastern Oromia region conducting research in the rural Goro Gutu area (see Table 4a).

*Table 4a: Fieldwork Interviewees - type and location*

Duration	Location	Activities
8 Days	Addis Ababa	Interviewing headquarters staff
3 Days	Harar	Interviewing Regional Staff
15 Days	Goro Gutu	Interviewing local government, ERCS staff, Netherlands Red Cross (NLRC) staff
	Medisa Jalala Kabele	Interviewing kabele committee, women's group, observed project development, observed kabele meetings, observed training sessions
	Yeka Jalala Kabele	Observed risk assessment process
	Yeka Umema Tokuma Kabele	Observed risk assessment process

### 4.1 Data Collection

#### *Qualitative Approach*

A qualitative approach was chosen in order to understand the experiences of people in their local environment (Malterud 2001). It was felt that this approach would best reveal relationships and behaviours that the research questions seek to address (Mullings 1999; Crang 2002). Although Baxter and Eyles (1999) criticise the approach for lacking thoroughness given the small sample of respondents that are often involved, Mahoney (2002) counters that the development of theory can effectively be conducted with a small sample as large data sets do not denote relevancy or accuracy. Furthermore, to engage marginalised groups, such as

women, a small scale qualitative strategy can provide more comfortable conditions for sharing experiences (McDowell 1992).

### *Interviews*

Both semi-structured individual and group interviews were conducted at research sites. These methods were chosen as it allowed face-to-face contact to facilitate understanding (Mahoney 2002). The flexibility inherent in semi-structured interviews helps develop rapport with interviewees (Baxter and Eyles 1999). Although information not pertinent to the research is exchanged, the flow of the interview process evolves more naturally (Baxter and Eyles 1999). Such interviews also allow for triangulation through combining knowledge gathered across scales and sectors (Malterud 2001). The group interview was conducted at a site particularly receptive to my presence. Individual interviews were not possible given the time constraints of participants so a group interview was more appropriate to engage with community members. Additionally, women were willing to be part of the informal group interview as opposed to individual settings giving added incentive to be flexible in interview conduct. Interviews were recorded with the full consent of participants and transcribed upon returning from the field.

### *Participant Observation*

Participant observation can enhance insight of the relationships and behaviours of research participants (Mullings 1999; Malterud 2001). Sandelowski (2000) adds that in field work all observations are data to be integrated into research findings. However, McDowell (1992) warns that participant-researcher relationships can interfere with observation and the method poses difficulties in filtering and interpreting what is seen (Baxter and Eyles 1999). However, it was felt that this method added valuable insights into the more formal data gathered through interviews and that the limited field time would offset immersion concerns. Observations were recorded as notes or pictures (with consent of participants) during meetings, training sessions or whilst walking. This information was used for triangulation purposes with the data gathered from interviews. Given the challenges faced during research (discussed below) participant observation was perhaps limited by my 'outsider' status. As I was instantly recognisable in all

research sites it is unknown how natural community members acted. However, this method was deemed appropriate as it helped to overcome issues posed by the language and gender as discussed below.

### *Sampling*

Convenience sampling was conducted due to the challenges of access to research groups (Mullings 1999). Baxter and Eyles (1999) recommend aiming to include participants outside the convenience sample: although an effort was made to do so, location and time limitations (Crang 2002) rendered such attempts unsuccessful making convenience sampling the most prudent method. Baxter and Eyles (1997) have critiqued this method as access does not denote knowledge. However, as participants crossed scales and most were members of communities where the research topic was being conducted, it was felt this would offset any shortcomings of the method.

## 4.2 Limitations

### *Language*

Ethiopia is a multi-language state. Whilst interviews in the capital could be conducted in English, research in rural areas required an interpreter. For the majority of interviews I was reliant on a member of the host organisation to translate. This posed problems of word choice for question clarity which is not unusual in social research (Roulston et al. 2003) and particularly affected those questions without a linguistic equivalent. There were instances where the conversion to English did not reflect the answer length given in the local Oromo language. Additionally, it was often the case that an extended conversation took place between the translator and the interviewee(s). I raised my concerns about this and was assured it was merely to establish clarity. It cannot be known how the dependability of the results (Baxter and Eyles 1997) was affected by this intervention. The flow of information was greatly impacted by the need for translation. Despite this, it must be stated that the interpreter was a very popular person in all communities and his help was invaluable in recruiting interviewees and providing translations over a 15-day period.

### *Access and Location*

Given the remote rural location of research sites access to and location of respondents and interviews were entirely dependent on gatekeepers, interest of communities and the weather. For research practicalities, phone coverage, road conditions and the weather heavily impacted the interview process. This was especially true for travel as it was conducted by motorbike, which was unsafe to use in wet conditions given that there were no paved roads at research sites. Additionally, I was reliant on gatekeepers and community leaders to organise meetings and provide access to project activities. This was particularly disempowering as meetings were consistently delayed, changed or cancelled with no notice provided as reflected on by Mullings (1999).

The location of interviews is important in setting the tone of the process and managing perceptions (Elwood and Martin 1999). In this case, participants decided on interview locations: this is encouraged in social research in order to provide a comfortable setting for the interviewee(s) (Elwood and Martin 1999). However, when speaking with one women's group, the women insisted that I sit in a chair whilst they squatted on the floor: they were concerned about dust on my clothes. Although I expressed my willingness to sit on the ground the group appeared more comfortable when I sat on the chair. This positioned me apart from the group and accented my outsider status.

### *Gender and Race*

As an individual, white female in a black community and amongst an all-male staff I was instantly identified as an outsider (Mullings 1999). I was met by a variety of reactions ranging from acceptance to wariness. Although many community members came to look at me, few would speak and those who did were generally male. This affected the interviewing process as I was unable to gather equal data sets from men and women. It also distracted community members in one area from participating in a group training session as they frequently got up to chase away onlookers, especially children.

As a female in particular there were occasions where I was patronised by older males in public. I felt that as my research time was short and I was reliant on

gatekeepers it would be prudent to ignore such instances and conducted my research as planned. Whilst the impact of this on the information provided by those concerned and any onlookers cannot be known I believe my reaction was more beneficial to my research and comfort than a confrontation.

#### 4.3 Analysis

Interviews and observations were recorded and transcribed whilst in the field to allow for maximum understanding and to allow for checking of the data where possible. Data was then coded manually and themes identified. Reference to the literature was made to identify synergies with the theory (Dey 1993). Triangulation of data sets, acquired using multiple methods, is encouraged by Baxter and Eyles (1997) to increase the potential for rigour in research.

## **5. Analysis**

This section presents research results and analysis based on the analytical framework presented in the literature review and methods chapters. Respondents are referred to using *P*, *G*, *O* and *GO* to distinguish between data sources. All quotes have been faithfully transcribed therefore all language irregularities are attributed to difficulties in communicating in a foreign language.

### **5.1 Research Question 1: What steps have been taken to integrate disaster risk reduction, climate change adaptation and ecosystem management and restoration in a community setting?**

From research in three kabeles it was found that facilitators and community members comprehended the challenges posed by disasters, climate change and ecosystem degradation. Understanding of the issues themselves varied, with climate change and adaptation to climate change proving the most difficult. Furthermore, implementing integrated actions to combat these issues and build livelihood resilience was affected by the various understandings of these issues.

#### **5.1.1 Perceptions**

For measures to simultaneously target disasters, climate change and ecosystem degradation, it is essential that their individual and combined importance be understood (Berkes and Seixas 2005). Therefore in this section the understanding of facilitators and local communities in these issues are assessed to gauge their perceived relevancy in Goro Gutu.

##### ***Facilitators***

The results indicate that facilitators are aware of disasters, climate change and ecosystem degradation in their individual states. More importantly, they are knowledgeable with regards to the linkages between the issues. Disasters and disaster risk reduction (DRR) was found to be the most comfortable avenue through which to address climate and ecosystem elements, for example:

*“In our Woreda, disaster, our people [recognise] disaster risk reduction...The people and the government, the community, they are aware of this DRR” (P1)*

Ecosystem degradation was identified as the issue of greatest concern (Image 5a) given its importance to livelihoods and survivability, which is in agreement with Anderies *et al.* (2004). Facilitators identified several negative impacts of ecosystem degradation in the Goro Gutu Woreda including lack of forage, deforestation and poor soil quality. In terms of climate change, facilitators highlighted changes in weather patterns to emphasise the impact of climate variations in the Woreda. Weather patterns were consistently used by two facilitators to demonstrate climate change impacts as the Woreda has high dependence on agriculture and therefore is dependent on precipitation patterns and intensity.

*“You know the communities...know when the rainfall occur normally. But now, just delayed ok and they can’t live” (P1)*

*“April to May rains did not come, so planting season must be rearranged” (P5)*

*Image 5a: Yeka Umema Tokuma identifying the importance of hazards by placing stones next to hazard name*



(Source: Author's own)



### *Communities*

Disasters risks were observed to be part of daily life in Goro Gutu. The data revealed concerns of food shortages and drought through discussions on soil and water quality and conservation. The community were engaged by firstly discussing disasters and DRR as it was advised that this was the best way to access community knowledge. However, the conversation topic was expanded by participants to incorporate climatic and ecosystem impacts. This suggested that disasters are approached holistically within the community and it did not warrant extended conversation without consideration of ecosystem and climatic concerns.

Ecosystem degradation was of paramount concern to all respondents. In all kabeles this issue was chosen as the hazard most affecting life and livelihoods. All subsequent development measures stemmed from the desire to improve the local ecosystem

*“We need to protect the environment ok” (G2)*

In their 2005 study, Berkes and Seixas made similar conclusions demonstrating the importance of ecosystem health to rural areas.

As related by facilitators, communities understand climate change through weather patterns. Participants expressed their concern of this issue, illustrated in Image 5b, in relation to its impact on ecosystems and disaster potential:

*“Due to climate change mainly related to rainfall, people are experiencing crop failure. What they are getting very small amount and...they have become vulnerable. Unless they have access to an external body they become unable to live by themselves [referring to food shortage]” (G2)*

*Image 5b: Crop failure in Medisa Jalala*



(Source: author's own)

### 5.1.2 In Practice

Facilitators and communities demonstrated an understanding of the interconnectedness of many disaster, climate and ecosystem elements. However, in practical terms there were challenges to their full integration:

*“we work with DRR and also work with CCA and EMR [ecosystem management and restoration]. If we do DRR then that means we do everything for others also. Have a plan to work with the three DRR, CCA, EMR together. At least we have the intention.” (P1)*

The belief that implementing one measure automatically addresses the other two factors was also related by other respondents:

*“If you work with DRR you reduce the climate change, you retain normal climate situation. We have such ideas. You do EMR you are doing all the others.” (P2)*

However, some participants did acknowledge the necessity of integrated strategies to build resilience:

*“When you are treated part you don't treat other part. To solve all problem you use all to make community resilient” (P2)*

*“if degradation is reduced then vulnerability can be reduced, reducing risk and exposure” (P5)*

The data reveals difficulties in translating the theory of resilience into practice, as reflected in Carpenter *et al.* (2005).

CCA was found to be the most challenging concept in the integration process. A local government official advised that local academic institutions share climate research with local government departments to help inform decision-makers and update training programmes. However, he noted that no ecologists participated in this knowledge exchange to identify the consequences for ecosystems. Additionally, climate knowledge was shown to vary amongst participants. CCA discussions revealed the belief that local climate could be directly affected by local CCA actions. For instance, government and non-government facilitators provided responses reflecting that local adaptation would provide tangible improvements at a national and local level, respectively.

Finally, whilst DRR and EMR actions have contingency elements, no such provision is made for CCA in Goro Gutu reinforcing the difficulty in addressing this issue.

## 5.2 Research Question 2: In what ways have livelihood vulnerabilities been addressed through a participatory approach?

This section shows that livelihoods in Goro Gutu are vulnerable and the measures that have been implemented to improve livelihood resilience.

### 5.2.1 Affected livelihoods

Livelihoods are the foundations on which resilience and capacity are built (Cannon 2008). Partners for Resilience aim to strengthen livelihood stability as a means of reducing vulnerability to shocks (NLRC 2010). This section explore why livelihoods are affected by disasters, climate change and ecosystem degradation.

Agriculture and livestock breeding are the main livelihoods in Goro Gutu, as advised by the head of the local agriculture department. Therefore they are particularly vulnerable to these issues.

#### *Agriculture*

Residents of the research sites are entirely reliant on local ecosystems for survival. The main source of income and basis of survival lie in crops, particularly sorghum. Prior to outside intervention, the Medisa Jalala women's association advised that mass deforestation occurred as land was cultivated for farming. Residents in Yeka Umema Tokuma revealed this occurred in reaction to increasingly erratic rainfall pattern and soil erosion forcing farmers to sow more land in the hope of yields that are enough for subsistence and a small income. Field officers advised that drought periodically affects the area exacerbating crop failure. Crop yields for this season are excruciatingly low. For instance, whilst they would normally provide for a household for three months, they will, at best, allow for one month's consumption. This affects people's ability to make a living and increases reliance on aid relief. Some technical measures to offset this disaster are unavailable to this area:

*“irrigation problem...there is none in the kabele. For irrigation you need rainfall but little rainfall” (G2)*

The unpredictable nature of rainfall makes preparation of land and planning for the growing season more difficult (EPA 2012). Often when rains do arrive they are short and intense, as anticipated by the IPCC (2007). Previous deluge has flooded farms and destroyed crops and land access.

### *Livestock*

Cattle breeding is a source of income for many in Goro Gutu. Participants in Yeka Jalala and Yeka Umema Tokuma commented that deforestation and poor soil quality has vastly reduced availability of forage. There is also a visible lack of access to water supplies across research sites. As a result animal productivity has fallen drastically and disease becomes an issue as animal well-being deteriorates. This is readily identified in Yeka Jalala and Yeka Umema Tokuma as a risk to livelihoods. Additionally, a low crop income means there is little opportunity to medically treat livestock or provide feed.

### *Diversification*

Despite diversification being recommended as a means to build resilience (Marschke and Berkes 2006; Yodmani 2001), facilitators advised that in Goro Gutu there are few opportunities to do so. This is because livelihoods revolve around land and there are few additional employment opportunities in the area. Also, travel is severely restricted by poor quality roads, reducing ease of access to outside markets and resources. Additionally, the agriculture office advised varieties of seed are difficult to access: from his own experience, one facilitator noted that lack of advice and training in the past have meant many were unaware of the advantages in planting different crops, including vegetables which, he advised, fetch a higher price.

#### **5.2.2 Livelihood actions**

Facilitator interviews revealed that communities are not always able to select development actions for their area. In all sites:

*“The priority the population prefer is water, unfortunately project funding not allocated. There was a need to allocate [funds], in that case it was delayed” (P2)*

One group interview also highlighted the importance of funding:

*“We have studies this river basin for irrigation but a shortage of funding means it stopped” (G2)*

Communities are empowered to identify prominent kabele issues and on this basis they are advised as to which actions can be implemented:

*“In community I go there and identify problem [with the community]. I will inform them I will tell you need to correct things and they will correct. If they are not able to correct I will contact Woreda office and the office will [help] them” (P2)*

As previously stated, migration is not an option communities are willing to explore, therefore, all action to combat risks must be in situ. Several actions have been embraced enthusiastically, such as land closures (Image 5c), spring point development (Images 5d and 5e), fuel-saving stoves (Image 5f) and dissemination of information through mini-media. These actions are conducted by residents with oversight from facilitators. They are popular as tangible progress has been made. Land closures have resulted in regrowth and one community identified increased forage for livestock as a result of their efforts. The spring development project has visibly contributed to what Chambers (1994c:1449) refers to as “social energy” as community members volunteer to assume committee responsibility for the management of water output points. Fuel-saving stoves have significantly improved the health of women and children as well as minimising deforestation. Women advised that traditional stoves resulted in burns and smoke inhalation which also irritated the eyes and skin. They commented that their health and that of their children, particularly the young who would be carried on their mother’s back whilst she cooked, suffered when using these stoves. The improved design has helped to reverse some of the adverse health effects.



*Image 5c: Land closure area allowing for regrowth*



(Source: Author's own)

*Image 5d:*

*Building of a cattle-drinking pond*



(Source: Author's own)

*Image 5e:*

*Protecting the spring's eye*



(Source: Author's own)

*Image 5f: Member of women's association with fuel-saving stove*



(Source: Author's own)

However, despite successes, respondents did point to areas where progress is yet to be made. In the first round of the project, a scheme to provide goats to the most vulnerable community members (as identified within kabeles) was developed. Goats can build livelihood resilience as goat-products can be sold in local markets and they provide diversification for an agriculture-dependent livelihood. A list of the most vulnerable was compiled and those at the top received a goat. Subsequently, these were then bred, with the intention that those next on the list would receive kids; the process should have continued until all on the list had received kids. Whilst the initial provision has been made, kid transfer had yet to be implemented upon conclusion of this research. The 2010 project evaluation had highlighted this issue for attention (Tadele and Ayalew 2010) but as yet no advancements have been made on this issue thus many vulnerable community members are still without vital livelihood assistance.

Additionally, facilitators identified missed opportunities to implement integrated DRR, CCA and EMR measures including using mud bricks to construct buildings. They advised that training would be simple, it is cost-effective as resources exist locally and the resulting buildings would be more sustainable as bricks are less vulnerable to heavily rain. Image 5g shows a traditionally constructed dwelling. One community advised:

*“School problem, the school that was constructed by the community and many of the time very easily acceptable [susceptible] it will be damaged (when discussing heavy rains)” (G2)*



*Image 5g: Building in Goro Gutu: mud is packed around the wooden poles*  
Heavy rain is able to wear down the packed mud which impacts the structures integrity



(Source: Author's own)

When buildings are affected by the rains, the community must take time to repair them. This means less time is spent tending to crops or other livelihood activities, which reduces income. It was suggested that if bricks were used then heavy rains and flooding would not negatively impact structure integrity thereby protecting residents and children attending schools. This situation highlights the difficulties in addressing all factors which come under the climate-smart DRR umbrella despite their ability to reduce risk.

A further livelihood action is seed selection. There has long been discussion of the suitability of using maximum yield crops (MYC) over climate-resilient varieties (Walker *et al.* 2002; Anderies *et al.* 2006). In Goro Gutu, the local agriculture department conduct awareness-raising sessions on both options:

*“There have been aware-ing the people to increasing production. They recommend people do this. It is not just to tell from the government only. It is convincing them what they prefer, which one is appropriate for me, they choose” (P1)*

Whilst the author felt this suggested MYCs are promoted in order to encourage increased production, facilitators advised that this was a misinterpretation. They clarified that farmers are presented with options and they choose the most appropriate for their short and long-term needs. Unfortunately it was not possible to attend an awareness-raising session to gain a more holistic understanding of advice given about seed and subsequent selection.

### 5.3 Research Question 3: What is the impact of the role of facilitator?

The success of community participation is, in part, dependent on the organisation, knowledge and approach of facilitators (Botes and van Rensburg 2000). This section will consider the contribution of facilitators to the success of the participatory approach in Goro Gutu. Data reveals that in terms of identifying vulnerabilities and avenues to improve livelihood resilience, facilitators employing the community approach were successful. Additionally, there is potential for established conditions to allow for self-organisation in livelihood activities.

#### 5.3.1 Training

##### *Facilitators*

In April 2012, ERCS facilitators attended DRR training which introduced the concept of disasters as socially constructed events in alignment with academic research (Wisner *et al.* 2004). Following this, facilitators felt they understood the importance of anthropogenic actions prior to, and in, extreme events. Additionally, although it was not widespread, some facilitators attended climate and environment themed (not focused) training. Governmental and non-government facilitators indicated that ecosystem degradation was fully integrated into DRR sessions, as they perceived the two to be inseparable. At an organisational level, within the ERCS there is a focal head for DRR and CCA but not for EMR. The responsible officers are based in the same building in Addis Ababa with excellent opportunity to collaborate. However, facilitators did not agree that a department for EMR is necessary: this was because they felt it was already integrated within DRR and CCA measures.

##### *Community Members*

Local government and development agents (DAs) conduct training in implementing DRR, CCA and EMR measures, and more specifically on climate change itself (P2, P3). Community members in Medisa Jalala advised they have been involved in many activities which integrate DRR, CCA and EMR elements. A women's association has been established with members trained in the production of fuel-saving stoves, as referred to in section 5.2.2. These stoves require less firewood

than traditional stoves which reduces deforestation in the area. The stove-making industry diversifies the women's livelihood activities and increases their income. For example, earnings from stove selling have been deposited in a bank account and the savings can then be used in periods of stress. This has increased capacity to withstand and recover from disasters and strengthens livelihood resilience of the women and their families. Additional trainings include spring-point water management which means a self-appointed community committee will be able to protect and operate a new spring development that has output points in three areas across the Medisa Jalala kabele.

The community's understanding of climate change stems from training sessions. Participants at all research sites were fully aware of weather patterns and the implications of changes. Residents in Yeka Jalala and Yeka Umema Tokuma advised they had undertaken autonomous adaptation and coping actions prior to formal training. However, following the climate change training, community members in Medisa Jalala related that they know weather patterns will continue to be erratic in the short term but in the long term "the climate will be better" (G2) as a result of their on-going adaptation actions.

One visiting facilitator, acknowledging this response, expressed the view that climate change and CCA are difficult subjects to effectively convey and so it was common for misunderstandings to exist amongst facilitators and communities alike.

### 5.3.2 Relationships

Good relationships exist between community members and facilitators at all levels. Facilitators know individual members, including kabele chairpersons, well and were enthusiastically welcomed upon arrival. This was seen to assist the organisation of group meetings, training sessions and access to information and resources.

On the other hand, the ERCS has only one permanent officer in Goro Gutu. Additional staff members are called in from regional and central offices when required. As such, there is a limit to oversight in the Woreda given the distances of research sites from the main town. One visiting facilitator observed that it is

difficult for a single officer to ensure project actions are implemented effectively and in a timely manner. It was commented that there was a lack of firm encouragement in the implementation of some measures which would have moved processes along. Additionally, there were instances where the need to involve women in the decision making process appeared to be forgotten. On two occasions, this researcher commented that there was no female involvement in the process. Proceedings were then paused until women could be found. One facilitator commented “we have a gender problem here”. It appeared that facilitators followed the lead of the community in the participatory process, which is correct, but did not exercise the oversight that was required to ensure a level of equity. Therefore, McDowell’s (1992) warning that extended exposure to a community can obscure relations and reduce efficacy of research is perhaps applicable here.

### 5.3.3 Self-organisation

The ultimate objective of community action is to establish conditions allowing for self-organisation (Pelling 2007). At one research site, the climate-smart DRR project is in its third year whilst the other two sites have just completed the initial evaluation. It is therefore difficult to definitively assess the conditions for self-organisation. This section will consider the potential of three measures based on discussions regarding exit strategies and ease of access to essential sources. These measures have been chosen as they are to be implemented at all research sites.

#### *Land Protection*

Land closures and conservation activities are well understood to be essential for survival within research sites. A warning and fine system is in place for any land incursions. At an outdoor meeting a committee member fired a warning shot into the air to indicate livestock had strayed into a protected zone. It was observed that the responsible farmer then removed the animal. Facilitators advised that farmers have been fined in the past for not removing livestock from these areas promptly. This measure is fully enforced at a community level and as fines are a substantial portion of farmers’ incomes there is real incentive to take responsibility for the protected zone and ensure sustainability.

### *Fuel-saving stoves*

As previously mentioned, fuel-saving stoves have been seen to reduce deforestation and improve the health of women and children. They have also contributed to livelihood diversification efforts and allowed for the accumulation of savings which will increase the resilience of participants and their families to resist and recover from disaster events or difficult times. This point makes the project worthy of further attention. The project is operated by a women's association and also employs two men for labour and has donkeys to use in transporting materials which are locally sourced. Upon enquiry it was stated that in the event of low resources, adverse weather or difficulties in transporting stoves for sale, if feasible the ERCS would provide assistance. The project itself is in its third year and so it is too soon to assess whether the association may become independent of this assistance or develop its own adaptation mechanisms. However, the association was seen to have a flexible organisational structure that allowed women to divide time between household and field duties and the stove project. It also allows for time off if additional labour is required at home. In this way, the project is likely to succeed as it is sensitive to women's needs, managed on site by the women's committee and provides real benefits in the form of savings.

### *Seed Selection*

Both climate-resilient and maximum yield crop (MYC) seeds have been selected in this area. Whilst Anderies *et al.* (2006) argue that MYC should be consigned to history, their use is justified by facilitators as essential to meet urgent short-term needs. Community members have been advised in government-run awareness-raising sessions as to the advantages of MYC in increasing national, as well as local, productivity. Facilitators related that fertiliser is provided either through the government or NGOs. However, ecosystem degradation was identified at all research sites as the most serious issue faced by communities. Given the existing poor soil quality, it is unknown how feasible MYCs are as a sustainable, self-organised option. For example, the FAO (1997) reports that increasing quantities of fertiliser will be required each year to provide soil nutrients for these crops, thus increasing costs and reducing sustainability.

On the other hand, climate-resilient crops require less fertiliser and less water. Therefore their selection has the potential to become a self-organised enterprise. The purchase of fertiliser could be undertaken at a local government level once efficient procurement procedures are in place. However, if the government is also funding fertiliser for MYCs, outside organisations such as the ERCS may be necessary to ensure all fertiliser needs can be met. It is the balance between MYCs and climate-resilient crops that will determine the self-organisation potential within seed selection.

## **6. Discussion**

The findings show that an integrated participatory approach has the means to engage communities and facilitate the implementation of development actions. It also reveals the possibility for the encouragement of potentially non-sustainable actions to further government objectives. The majority of integrated development measures received popular support particularly when addressing DRR and EMR concerns which are widely understood. However, limited knowledge of climate change has affected perceptions of risk and therefore decisions as to the appropriate adaptation measures to be adopted. This discussion will consider these outcomes with reference to SES literature as presented in chapter 2.

### **6.1 Efficacy of the integrated participatory approach to address livelihood resilience:**

As the literature in chapter 2 demonstrates, a community participatory approach has the potential to be emancipating (Pelling 2007) and energise communities resulting in cooperation across the social sphere (Chambers 1994c). It has been shown in section 5.2.2 that communities embraced risk reduction strategies and have developed their own rules and regulations to maintain the measures: for example, the fine system introduced for incursions into protected areas. Participation, to an extent, has provided the tools for self-organisation as people have seen the value in actions implemented. This may be because prior to these interventions there had been few widespread coordinated preventative actions in the area; most assistance came in the form of relief aid. The participatory approach may be seen in this case as empowering as it provided a pathway out of dependency.

Section 5.1 revealed ecosystem degradation to be the hazard communities felt most warranted immediate attention as it affected both their security and livelihoods. All implemented actions addressed this environmental concern with a view to building livelihood resilience. This reflects Seifer and Calleson's (2004) argument that local knowledge and issues must be integrated into development planning for the process to be successful. As a result of commitment to the risk reduction measures:

*“Now there is area closure...forage for the cattle has increased. Training has been for community...From that training they has knowledge to protect their environment” (G2)*

Whilst this shows that community concerns are being addressed there is an inevitability regarding this point. Land in Goro Gutu was severely degraded and therefore it was impossible for development actions which did not integrate ecosystem concerns to be implemented. Government facilitators acknowledged that degradation was always their greatest concern; therefore, even without community support, it is likely that such measures would have been implemented.

## 6.2 Limitations of the integrated method:

### *Knowledge gaps*

Section 5.1 introduced the difficulties of fully understanding the integration process. The belief that addressing one or two of the DRR, CCA and EMR strategies would automatically integrate all considerations into planning was relatively widespread and perhaps demonstrated the innovative nature of this project. Mercer (2010) indicates that the integration of the three strategies has yet to be mainstreamed, therefore this project will be one of the first to contribute ‘lessons learned’.

Climate change and CCA proved to be the most difficult concepts to understand, communicate and create contingencies for. This concurs with the findings of Byg and Salick (2009) and Mercer (2010). This has several implications for livelihood resilience in Goro Gutu where ecosystem health determines survival. Omissions in climate change knowledge reduces the overall preparedness of communities and facilitators to plan for uncertainty. Embarking on an integrated path with incomplete knowledge may result in the need to readdress some measures in the future as they prove to be inefficient as environmental conditions change. The choice of MYC may be such a measure given their water and fertiliser requirements. Though the promise of higher yields is attractive, the resulting soil degradation, need for increasing quantities of fertiliser and regular rainfall may ultimately prove detrimental to livelihood resilience if climatic conditions and resources do not converge as required. However, this research was conducted



within a limited time frame with a small sample of participants, and so it was not possible to fully ascertain the reasoning behind the use of MYC. It is the author's speculation based on observations and secondary research that is informing this conclusion.

### *Oversight*

Given that this is a multi-site project the issue of oversight is salient. Given the Woreda's remote location it is clear that retaining officers in the field for long periods of time is difficult. However, in order to advance projects and ensure that personal relations do not hamper the process, it was seen in section 5.3.2 that a single, permanent, or at least regularly visiting, officer was not sufficient. At the time of research, outside facilitators were responsible for several sites and made short, irregular visits to the Woreda. As a result, supervision of projects, from an ERCS perspective, relies on the ability of one officer to oversee activities occurring in four separate kabeles which are some distance apart and vary in accessibility. Additional assistance is only provided when requested: for instance, when a new phase is to begin, or during a scheduled visit. It was suggested by an international facilitator that ERCS headquarters would benefit from assigning a responsible officer for the Woreda who could then visit for a few days at a time and on a more regular and frequent basis. At the time of research, external officers spent around two days visiting all four kabele sites. The facilitator expressed the opinion that this would develop relations and increase oversight. This issue may become more relevant if some implemented measures prove unsustainable. One such measure may be the selection of MYC to reduce food insecurity, as discussed above.

## 7. Conclusions

As a response to calls for community-based SES studies (Walker *et al.* 2002), this research has presented findings from Goro Gutu, Ethiopia. SES literature has been drawn upon to investigate the efficacy of using an integrated participatory approach in establishing livelihood resilience conditions in Goro Gutu, Ethiopia, an area dependent on local ecosystems. The following conclusions have been drawn:

The participatory approach forms collaborative partnerships with the potential to address livelihood concerns:

Berkes and Seixas (2005) found that cross-scale collaboration is essential in building resilience in SES. Cross-scale interaction was seen to be inherent throughout this integrated participatory process. This allowed for the exchange of a variety of knowledge and access to the expertise necessary to address community needs (Cumming *et al.* 2005) as was the case with the spring development, fuel saving stoves and resilient seed selection projects. In this way, the participatory approach permitted access to the resources required to increase livelihood resilience.

However, limited oversight from ERCS as the funding partner resulted in slow progress of certain projects and questions of the sole field officer becoming ‘too close’ to communities, thus diminishing efficiency. Despite the ability to request additional staff when necessary, additional officers spend a short time in the field and so their ability to drive progress is perhaps limited.

DRR and EMR can be effectively addressed using the participatory method:

The research showed broad understanding of the interaction between disasters and the ecosystem and the necessity of addressing them simultaneously in order to build resilience. As anticipated by Sallu *et al.* (2010), communities clearly identified the dependency of their livelihoods and means to survive on ecosystem health and sought to safeguard it against anthropogenic interference and climate-induced disasters.

### Knowledge gaps have potential to cause future issues:

The difficulties of addressing and communicating climate change issues have resulted in a variety of understanding on the topic. Whilst weather patterns are effective in illustrating one aspect of the issue they do not comprehensively relate the uncertainty inherent in climate change. The inclusion of adaptation was implied to be a long-term objective, perhaps as an understanding of the subject and possible adaptation measures develops. In the short-term, more immediate needs took precedence as Cannon (2008) suggests. Whilst this may serve to reduce vulnerability now, measures will need to be readdressed in the future to integrate flexibility and adaptation mechanisms to build resilience.

### Positioning of this paper in wider research

This research answers the call for case studies from the human development perspective within SES (Berkes and Seixas 2005; Carpenter et al. 2005; Allison and Hobbs 2004). It supports the findings of Anderies et al. (2006), Gunderson (2000) and Walker et al. (2006) that ecosystem dependent regions must adopt an integrated approach to develop resilience in the system which will provide for human and ecological needs.

Moreover, the research reiterates the importance of considering livelihood behaviours in the context of SES as argued by Anderies et al. (2004). Its importance stems from the fact that livelihoods are essential to survival and are likely to take precedence over development or conservation actions. As in this case, it is not always possible to pursue the ideal of diversification therefore in situ adaptive options are required.

The development of SES and resilience literature would, perhaps, benefit from additional research in this area to expand the opportunities to build resilience.

## **Appendix A: Confirmation of Ethics Approval**

Dear Gillian Logie,

KCL/11-12\_1233 Disasters, Adaptation, and Development

I am pleased to inform you that full approval for your project has been granted by the GGS Research Ethics Panel. Any specific conditions of approval are laid out at the end of this email which should be followed in addition to the standard terms and conditions of approval:

- Ethical approval is granted for a period of one year from the date of this email. You will not receive a reminder that your approval is about to lapse so it is your responsibility to apply for an extension prior to the project lapsing if you need one (see below for instructions).
- You should report any untoward events or unforeseen ethical problems arising from the project to the panel Chairman within a week of the occurrence. Information about the panel may be accessed at:  
<http://www.kcl.ac.uk/research/ethics/applicants/sshl/panels/>.
- If you wish to change your project or request an extension of approval you will need to submit a new application with an attachment indicating the changes you want to make (a proforma document to help you with this is available at:  
<http://www.kcl.ac.uk/research/ethics/applicants/modifications.html>).
- All research should be conducted in accordance with the King's College London Guidelines on Good Practice in Academic Research available at:  
[http://www.kcl.ac.uk/college/policyzone/index.php?id=247&searched=good+practice&advsearch=allwords&highlight=ajaxSearch\\_highlight+ajaxSearch\\_highlight1+ajaxSearch\\_highlight2](http://www.kcl.ac.uk/college/policyzone/index.php?id=247&searched=good+practice&advsearch=allwords&highlight=ajaxSearch_highlight+ajaxSearch_highlight1+ajaxSearch_highlight2)

If you require signed confirmation of your approval please forward this email to [sshl@kcl.ac.uk](mailto:sshl@kcl.ac.uk) indicating why it is required and the address you would like it to be sent to.

Please would you also note that we may, for the purposes of audit, contact you from time to time to ascertain the status of your research.

We wish you every success with this work.

With best wishes

Yours Sincerely,  
GGS Reviewer

Conditions of approval (if blank there are no specific conditions):

[BLANK]

## Appendix B: Ethics Screening Form

### Research Ethics Screening Form for Taught Graduate Students in the School of Humanities

This form will assist in determining whether or not you must seek ethical approval for your research under the guidelines for working with human participants set out by the Research Ethics Sub-Committee (RESC) and the Research Ethics Panel (REP) which is responsible for granting ethical approval for the School of Humanities.

In order to complete this, you must

- (1) complete this form (plus the signature of your supervisor)
- (2) complete a risk assessment form if appropriate
- (3) familiarise yourself with at the College's Good Practice in Research guidelines  
[www.kcl.ac.uk/college/policyzone/attachments/good\\_practice04.pdf](http://www.kcl.ac.uk/college/policyzone/attachments/good_practice04.pdf)

You should take this form with you when you meet your supervisor to discuss your dissertation, so that it can be completed early in your career here at King's.

1) Have you completed a Risk Assessment form if your research is likely to place you at more risk than in your everyday life?

☒ Yes ☐ No

2) Have you read and familiarised yourself with the College's Good Practice in Research guidelines?

☒ Yes ☐ No

3) Based on the flow chart and requirements set out by the REP (see the page following), does your research "involve human participants" and/or "raise other ethical issues with potential social or environmental implications"?

☒ Yes ☐ No

If you answered **Yes** to question 3, you **MUST** fill out an 'Ethical Approval Application' and receive approval from the REP **BEFORE** you begin your research – so early planning is essential.

If you answered **No** to question 3, you do not need to seek approval for your research.

You must sign this form, get your supervisor's signature, and submit the form to the School Office to be kept on file. **Send to Lisa-Marie Ingamells, Postgraduate Taught Records Officer, School of Humanities, Room 3B, King's College London, Strand, London WC2R 2LS.**

*Glogie*

23.04.12

Student – sign and date

*M Pelling*

25 April 2012

Supervisor – sign and date

GILLIAN LOGIE

Student – print name

1032553

Student – ID Number

Geography: Disasters, Adaptation, and Development

Student – Department/Programme

For information and links to the Research Ethics application procedures and forms, go to the Humanities Research Ethics webpage at [www.kcl.ac.uk/hums/info/reseth](http://www.kcl.ac.uk/hums/info/reseth).

## Appendix C: Risk Assessment Signatures

### 3 RISK ASSESSMENT FORM AND ASSOCIATED DOCUMENTATION

This page **must be completed** for all fieldwork taking place outside the Department of Geography, any laboratory work inside the College premises and ALL student dissertation projects, whether human or physical, and whether undergraduate, postgraduate taught or postgraduate research.


**AFTER** reading through ALL risk categories, please sign RISK TYPE A or B below, which applies to you.

**RISK TYPE A.** I have considered ALL categories in this form and I declare that I am undertaking a student project/dissertation where NONE of my research will be outside of college premises or home, and will not involve any of the risks identified in ANY of the categories of this risk assessment form. For example, the research wholly involves library/archival research or analysis of existing on-line/other data. None of the risks of my project/dissertation are greater than in everyday life and normal activities. Should my research project change, such that there risks involved, it is my responsibility to fill out this form appropriately and obtain the appropriate signatures for Risk Type B.

<b>SIGNATURES OF PERSON FILLING IN A RISK ASSESSMENT AND COUNTERSIGNATURE.</b>
--

<b>A. Person filling in this risk assessment</b>
--

<b>Name (Typed or printed in BLOCK letters): GILLIAN LOGIE</b>
--

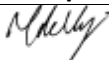
<b>Signature:</b> 
---

<b>Date: 25 April 2012</b>
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<b>B. Countersignature and date</b>
-------------------------------------

(Students – Research Supervisor; Research Staff – Project Leader; Academic Staff – Head of Department)
--

<b>Name (Typed or printed in BLOCK letters): Mark Pelling</b>
---

<b>Signature:</b> 
---

<b>Date: 25 April 2012</b>
----------------------------

<b>Print this page in triplicate; the three copies signed and countersigned, and lodged with:</b>
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- |  |
|--|
| <ul style="list-style-type: none"> <li>(1) Your supervisor.</li> <li>(2) The Department Office.</li> <li>(3) One for retention by yourself.</li> </ul> |
|--|

For UGT and PGT students, this signatures page of your risk assessment must be included in Appendix 1 of your dissertation.
---

**RISK TYPE B.** I have considered ALL categories in this form, indicated which risks apply to me that are greater than in everyday life and normal activities (writing yes/no for every section), for those sections where I have answered 'yes' I have indicate the degree of risk from 1–5 (1=low, 5=high), where appropriate added notes and indicated other additional risks in the final section.

For work outside of the UK, please do not forget to obtain insurance in accordance with College regulations (application form <http://www.kcl.ac.uk/about/structure/admin/finance/staff/insurance/travel.html>).

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