



**Pastoral Land Privatization and
Community Adaptability to Climate
Change in Maji Moto, Kenya:**
*On Opportunities and Negative Implications of
the Tenure Reform*

James Wangu



Universiteit Utrecht

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On Opportunities and Negative Implications of the Tenure Reform

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Supervisor: Dr. Caroline Archambault



Utrecht University

*I dedicate this thesis especially to my mom **Bancy Wangu**, family members and friends for the support that has helped me make it this far in my education.*

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‘Ashe Oleng’
James Wangu

Preface

While doing my masters study in sustainable development at Utrecht University, I have developed huge interests in three key interrelated areas: livelihoods, natural resource management and climate change. The livelihoods for the 'poor' rural communities in developing countries are based on natural resources and with the impacts of climate change on the latter, many people's livelihoods are endangered. Coincidentally, this thesis bears all these three components.

In the first year of my masters, I set out to do a research internship among the Maasai communities in Elangata Wuas, Kajiado County. The project focused on the on-going tenure reform - privatization of a formally collectively utilized group ranch, with an aim of exploring whether serious inequality in terms of land and land resources distributed had surfaced. The findings from this (1st years' research internship) study which showed that significant inequalities had occurred inspired this thesis, conducted in a different Maasai community, Maji Moto in Narok County, looking into how pastoral land privatization among the Maasai communities in Kenya influence climate change impacts and local people's ability to adapt.

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List of abbreviations and acronyms

ASALs	Arid and Semi Arid Lands
CASL	Community Adaptation and Sustainable Livelihoods
CC	Climate Change
FAO	Food and Agricultural Organization of the United Nations
GHGs	Green House Gases
GoK	Government of Kenya
GR	Group Ranch
IDGEC	Institutional Dimension of Global Environmental Change
IDRC	International Development Research Centre
IGA	Income Generating Activities
IISD	International Institute for Sustainable Development
ILEPA	Indigenous Livelihoods Enhancement Partners
ILRI	International Livestock Research Institute
IPCC	Intergovernmental Panel on Climate Change
IRIN	Integrated Regional Information Networks
IUCN	International Union for Conservation of Nature
KSh	Kenya Shillings
MM	Maji Moto
MMNR	Maasai Mara National Reserve
NCCRS	National Climate Change Strategy
NDMA	National Drought Management Authority
NEMA	National Environmental Management Authority
NGOs	Non Governmental Organizations
RoK	Republic of Kenya
SCI	Stockholm Environment Institute
SSA	Sub-Saharan Africa
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Dollars
WWF	World Wildlife Fund

Executive summary

This thesis broadens the knowledge of climate change (CC) by showing that its impacts are real and that different community members in the poor societies are socially and economically heterogeneous in their ability to adapt to climate change. Additionally, amid climate change, these communities are experiencing other forces including land tenure reforms, population growth, rapid urbanization and migration, education expansion, diversification, income inequality, technological innovation that induce livelihood dynamics, which further alter the socio-economic setting and thereby influence climate change impacts and local people's adaptability to the impacts. Both aspects, climate change's effects and other forces, have received little attention in the research, policy and socio-economic development arena.

The overall objective of this study was to explore various climate change adaptation aspects among pastoralist communities with a specific focus on how tenure reform - privatization of previously communally utilized land and land resources which has influenced climate change's impacts and local people's ability to adapt to these impacts. To do so, the study combined several major approaches. The first approach provided for an analysis of the problem of climate change in the study area. This first approach was based on the United Nations Framework Convention on Climate Change (UNFCCC) handbook on vulnerability and adaptation assessment framework. The existing literature on the assessment of pastoralist communities' vulnerability to climate change has concentrated broadly on the impacts of climate change on livestock and livestock-livelihood systems. The assessment framework in this study moved a step further to look into the socio-economic heterogeneity (in terms of wealth, gender, age) among the local population that influence how differently people are impacted on by climate change. The second approach assessed the influence tenure transition has on climate change and local people's ability to address the impacts of climate change. The approach built on the sustainable rural livelihood framework to show that tenure related institutional changes, introduce radical livelihood dynamics, influences local people's mediation on the impacts of climate change. Two key concepts are applied in the assessment of tenure transition-livelihood dynamics: institutions and gender.

Four qualitative research methods were employed during the data collection process, comprising: one, a literature review to gather secondary data from the academic journal and reliable publications and websites by the government and NGOs on the different issues presented, two, focus group discussions with youth and women three, 31 semi-structured interviews with local key informants and development experts from local government organizations, and four, participant observation as the sources of primary data. The case study was conducted in a semi-arid pastoral Maasai community, Maji Moto in Kenya, a recently privatized group ranch in Narok County.

The findings show that Maji Moto community members are experiencing the impacts of climate change. The impacts, however, are felt differently among different community members at the household level and individual level, based on wealth, age, marital status and gender. Relatively poorer people, and those who have least diversified their livelihood being more affected. Women, due to fewer economic prospects, are also more affected compared to men. The impacts of climate change and the local adaptation efforts are compounded by the tenure transition, which has: one, created new opportunities to adapt to climate change including new livelihood options and more economic prospects for women. Two, introduced many negative implications that enhance the negative climate change impacts. Privatization exerts pressure on most community members who are heavily reliant on pastoralism for their livelihood by restricting mobility essential to access the limited water and pasture resources that are spread across time and space in the landscape. The tenure transition has also induced major socio-economic and ecological marginalization as natural resources and social utilities are extremely uneven across the Maji Moto landscape, which jeopardizes their livelihood pursuit, and hence increases vulnerability to climate change impacts. Land sales in the aftermath of privatization are seeing many people disposing of the only livelihood capital they can depend on. Privatization also risks possibilities of conflicts in the future over increased scarcity of water and

pasture resources, land boundaries or more intimate family feuds over land. Last but not least, privatization and sedentarization is linked to wildlife decline, an outcome that could hurt people dependent on the wildlife industry.

From these thesis findings, it is concluded that there is a strong need to bring pastoralists into the debate, discussions and policy dialogue about climate change, and in general, i.e. not restricted to pastoral communities, the importance of incorporating the notion of socio-economic heterogeneity within communities that show how the climate change impacts affect different people based on their socio-economic conditions. Similarly, a great deal of focus in the field climate change adaptation is needed in the area of livelihood dynamics from the on-going socio-economic forces land tenure reforms, population growth, rapid urbanization and migration, education expansion, diversification, income inequality, technological innovation among others that can radically alter the ways in which different community members are being impacted by climate change. On a policy level, there is a need to initiate institutional innovation and new ways to support pastoral communities to reap benefits from the privatized settings such as: investment in pastoralism infrastructure and more general investment in education and other social amenities to help MM residents diversify their livelihood pursuits, and consequently boost their adaptive capacity to climate change impacts.

Keywords: ASALs, Climate Change, Gender, Institutions, Kenya, Land, Livelihoods, Maasai, Natural Resource Management, Pastoralism, Privatization

1. Introduction

“...under either scenario, the poor will be hit first and hardest. This means that people who are least responsible for the raising the Earth's temperature may suffer the gravest consequences from global warming. That is fundamentally unfair.” Jim Young Kim, The world Bank Group President (World Bank, 2013 par. 8).

Climate change (CC), defined as “any change in climate over time, whether due to natural variability or as a result of human activity” (IPCC 2007: 21) has been named “the defining challenge of our time” (UNEP 2014 par 1). The threat posed by the observed evidence of the changing climate to livelihoods and socioeconomic development is well pronounced. Controversy (Hulme 2010) aside, as warned by IPCC (2007), the established evidence affirms the critical reality hence a strong need for attention from the global society. They include a doubled increase in the global surface temperature by “an average of 0.13°C per decade” recorded in a period of 50 years - 1956 to 2005 (*Ibid* 2007: 30) The global sea level has been rising “at an average rate of 3.1mm” annually between 1993-2003, while snow and ice has been declining with the satellite data showing that the “...artic sea ice extent has shrunk by 2.7% per decade” (*Ibid*). While some areas have witnessed increased precipitation from 1900 to 2005 - North and South America, northern Europe and northern and central Asia, others have recorded a decline - Sahel, the Mediterranean, southern Africa and southern Asia (*Ibid*). As indicated in the latest edition of the IPCC (2014) report on CC, Eastern Africa has experienced increase in the frequency of droughts and heavy rainfall (floods) in the last 30-60 years.

While CC is a global phenomenon, the level of related impacts vary globally at a regional, national, sub-national, sectorial, community, family and even at the individual levels. As the World Bank (2013) highlights, the geographical and socio-economic conditions determine the level of vulnerability to the change. Africa, for instance, is considered to be most vulnerable to the impacts of the changing climate and climate variability due to two key reasons (IPCC 2001; 2007). One, poverty and underdevelopment that limit her adaptation capabilities. Two, the region's strong socio-economic dependence on natural resources, whereby geographical and climatic conditions also contribute to weak adaptation capacity. In most of the African nations, agriculture (crop cultivation and livestock keeping) dominates rural livelihoods and economic growth (Challinor et al. 2007). However, as informed by FAO (2003), CC will impact both crop and livestock systems. Overall, agriculture, water resources, ecosystems and human health are the areas most vulnerable to CC (World Bank 2013).

Globally, pastoralist communities found in the arid and semi-arid lands (ASALs) - which on estimate cover 41% of land worldwide (Barrett & Santos 2014; UNEP 2006), are amongst the most vulnerable to the impacts of CC. Within ASALs, extensive livestock keeping is the key to socio-economic systems, supporting tens of millions (- in Africa), but regularly suffers humanitarian crises from droughts that occur periodically (Barrett & Santos 2014). Through the centuries, *pastoral systems/pastoralism*¹: livestock keeping, natural resource management practices including the socio-cultural systems in support, have gradually evolved to

¹ Pastoralism definition – “...is the finely-honed symbiotic relationship between local ecology, domesticated livestock and people in resource-scarce, climatically marginal and highly variable conditions. It represents a complex form of natural resource management, involving a continuous ecological balance between pastures, livestock and people” (Oxfam 2008a: 7).

thrive in the harsh climatic conditions (Behnke et al. 1993; Ellis & Galvin 1994; Smith 2005). However, as argued by Barrett and Santos (2014) the relatively rapid change in climate as manifested through extreme events (e.g. increase in drought frequency) is a huge threat to pastoralism. The socio-economic and ecological sustainability of the natural resources that are fully depended on by the pastoral systems is predicted to decline due to exposure to the CC effects - “increase of inter-annual and seasonal variation” (Nardone et al. 2010: 64).

The global drylands hosts more than 2 billion people, and livestock production takes place in two-third of that area (Clay 2004). Livestock supports more than one billion people (World Bank 2007). 70% of the 880 million rural poor (those living below the USD 1.00/day threshold) partly depend on livestock for their livelihoods (*Ibid*). Elsewhere, it is argued that economically, culturally and socially, pastoralism is the most appropriate livelihood strategy to ensure well-being among the communities in ASALs (ILRI 2006, UNDP 2006; Nori et al. 2008). “Pastoral mobility... has provided herders with the flexibility to survive in patchy and unpredictable low-productivity environment (Fernandez-Gimenez & Le Febre, 2006: 341). Based on this overview, ASALs and pastoral systems are central to livelihoods and socio-economic development needs for a significant group of the global population. The CC effects on ASAL and pastoralism are critical threats that need to be addressed. Surprisingly, as stressed by Barret and Santos (2014) the consequences and/effects of CC on livestock systems and holdings has received little attention (exceptions, Scoones 2004; Seo & Mendelsonhn 2008; Thornton et al. 2008; Seo et al. 2009), with most of the focus being on the assessment the effects on crop output. The social, political and economic marginalization of ASALs (Amanor 1995; UNEP 2006; Nori et al. 2008; Oxfam 2008a) largely explains the lack of attention to climate change problems among pastoralist communities. In their review on what is known and what needs to be known on the impacts of climate change on livestock and livestock systems in developing countries, Thornton et al. (2009) expresses the need for the adjustment of research and development organizations’ agendas towards meeting the needs of the vulnerable pastoralists in the future decades.

Complicating the situation in ASALs and for pastoralist communities amid the changing climate, are various drivers of change, particularly in developing countries that are rapidly changing livestock systems (*Ibid*). Population increase and rapid urbanization are two such drivers of change. The on-going tenure reform, *communal-pastoralist land privatization*, being experienced in ASALs by the global pastoralist communities, and in African communities specifically among the Maasai in Kenya (Galaty 1992; Ning & Richard 1999; Niamir-Fuller 1999; Fratkin 2001; Blench 2001; Galvin et al. 2008) is another, current, interesting driver of change. Among the forces that are pushing for the tenure change, particularly among the East Africa pastoral communities is government adoption of donor supported policy that support private tenure (Galaty 1992; Niamir-Fuller 1999; Blench 2001; Fratkin, 2001). Some of the internal pressures to privatize include need for secure tenure, population increase, freedom to use land individually as desired (*Ibid*). The conversion of formally communal owned/utilized land to private tenure is not only affecting the existing pastoral/livestock livelihood systems but is also creating room for livelihood transitions among the locals. The tenure transformation outcomes, including fragmentation of grassland, social stratification – inequality, land sales

and gender dynamics (Galaty 1992; Fratkin & Smith 1995; Lesorogol 2003; Galvin 2009) have implications on local access to livelihoods and consequently on the local household's/individual's adaptation to CC. So far, the research on pastoral land privatization has focused on the assessment of the impacts the process has on pastoralism and the pastoralist communities (Galaty 1992; Rutten 1992; Peters 1994; Pinckney & Kimuyu 1994). As emphasized by Thornton et al. (2009: 113) "little is known about the interactions of climate and increasing climate variability with other drivers of change in livestock systems and in broader development trends", hence a crucial and compelling area of research.

1.1. Objective

The future success of adapting to/coping with the changing climate largely depends on the availability of broad knowledge on the vulnerability and adaptive capacity pastoralist communities have to the changing climate. Such knowledge should include the insights on the implications of the on-going tenure transition on local ability adapt to CC impacts among the pastoralist groups. Conversion of communal land to private holdings has major impacts on local livelihoods, and consequently affects people's ability to adapt with the impacts of the changing climate.

This thesis, therefore, aims at exploring the adaptation aspects of climate change among pastoralist communities by specifically focusing on a pastoralist group in Kenya's ASALs. In addition to shedding light on the CC impacts and adaptation strategies, the study provide fundamental insight on the importance of recognizing communities members' socio-economic heterogeneity and structural changes, such as from land tenure transition, effect the local livelihoods, in the future adaptation policies and interventions.

Specific objectives

This study has scientific and developmental objectives.

Scientific objective

By focusing on the influence of privatization on CC adaptation, this research will provides deeper knowledge about and new insight on the debates surroundings livelihoods in relation to privatization and CC in (ASALs) pastoral communities. The study will also expand the academic knowledge by contributing to theories on natural resource management, CC among other key areas in these communities.

Development objective

This study will offer evidence-based recommendations for the policy formulation and implementation on CC policies and interventions. These recommendations are aimed at ensuring the success of those interventions, thereby enabling the communities to evade the adverse impacts of CC on local livelihoods.

1.2. Main research question

To meet the objectives, this study conducted in a pastoral Maasai community in Kenya was guided by the following research question:

In what ways does pastoral land privatization influence climate change impacts and the local people's ability to adapt to the impacts?

Sub-questions

The thesis's main research question is split into six sub-questions to broaden the scope of the study and the analysis of the findings.

Regarding climate change and adaptation strategies:

In what ways does climate change impact on pastoral communities, and what are the local adaptation strategies to address them?

Regarding land privatization:

What are the key issues surrounding land privatizations among the Maasai?

Regarding the implications on CC adaptation efforts of the changes brought about by the move from communal land system to private land system:

In what ways does pastoral land privatization enhance the local people's ability to adapt to climate change impacts?

In what ways does pastoral land privatization exacerbate the problem of climate change and/or undermine the local people's ability to adapt to the change impacts?

To aid in establishing framework to address the negative privatization influences on CC adaptation the research asks:

How can the negative influence of pastoral land privatization on climate change impacts and the local people's ability to adapt to the impacts be addressed?

1.3 Structure of the thesis

This thesis comprises of two main parts: *the research* - chapters one to three, and *the findings* - chapters four to nine. The first chapter explains the relevance of this study; presents the objective and research questions, which is followed by chapter two that covers the theoretical background and literature review. Chapter three, presenting the research methodology, then follows. In the findings section, the analytical chapter four presents the issue of climate change in the study area. Chapter five covers the issue of land privatization. Chapter six presents the opportunities of land privatization in Maji Moto in the context to CC impacts, while chapter seven covers the negative implications of the tenure reform. In chapter eight, the recommendations in terms of future strategies are explained to address some of the previously discussed negative implications. Finally, the last chapter provides the conclusion and discussion of the study findings

2. Theoretical background and literature review

This chapter presents the theoretical background together with the literature review that guide this study. *Climate change*², the overarching subject in this study, is a complex issue warranting significant review. To understand how CC impacts interact either directly or indirectly with the local livelihoods and socio-economic development systems, thereby uncovering its impacts, adaptation/coping strategies of the pastoralists' communities, this thesis uses various relative approaches. At this point, it is crucial to note that the term adaptation, as used in this thesis refers to a sustained livelihood amid the adverse impacts of climate change.

The *first approach* entails the widely recognized – *framework for assessing vulnerability to CC* borrowed from the United Nations Framework Convention on Climate Change (UNFCCC 2006) *Handbook on vulnerability and Adaptation Assessment*. Here, vulnerability to CC refers to “...the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability “is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity” (IPCC 2007: 21). From the definition, three components as presented in figure 1 determine the level of vulnerability: exposure, sensitivity and adaptive capacity.

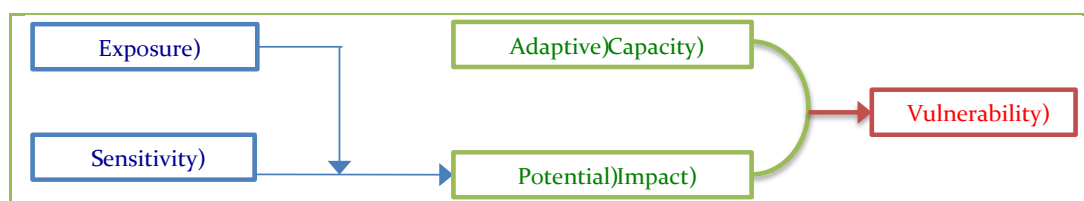


Figure 1: Climate change vulnerability. Reconstructed from (Davies et al. 2010)

Exposure refers to the risk from CC, including the change itself; for instance, the effect a change in weather can have on people, species and other natural resources (UNFCCC 2006); CC related diseases that affect people and species or drying of rivers for water resources. *Sensitivity* on the other hand, as defined by IPCC is “the degree to which a system is affected, either adversely or beneficially, by climate-related stimuli” (Ibid: 3). Important to note, as highlighted by Smit and Wandel (2006: 286), “exposure and sensitivity are almost inseparable properties of a system and are dependent on the interaction between the characteristics of the system and on the attributes of the climate stimulus”. The combination of the two determines the potential impact from CC. The *adaptive capacity* defined as “the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences” (IPCC 2007: 21). The UNFCCC (2006) emphasize the inclusion of all these components for a comprehensive vulnerability assessment. Studies focused on the impacts of CC on agricultural crop production in Africa exemplify the application of this framework. The (potential) impacts of CC, which entails exposure/sensitivity – e.g. the effects the variation in temperature, precipitation and droughts on crop yields have been a key focus on the risks assessment of the CC

² Climate change defined in the introduction as: “any change in climate over time, weather due to natural variability or as a result of human activity” (IPCC 2007: 21).

phenomenon poses on African agriculture (Morton 2007; Thornton et al. 2010; Muller et al. 2011). The adaptive capacity element of the assessment is largely concentrated on creating mechanisms to adapt to varying weather conditions and impacts this has on African farming (Muller et al. 2011) e.g. improved climate change and variability and early warning systems aimed at subsiding vulnerability to the related future risks.

The existing literature on the pastoralist communities' vulnerability to the impacts of CC focuses broadly on the effects on livestock and livestock-livelihood systems (see, Morton 2007; FAO 2009; Thornton et al. 2009; Nardone 2010; Dong et al. 2011; Pricope et al. 2013; Barret & Santos 2014; Megersa et al. 2014; Martin et al. 2014). Although the information gathered is significant to understand the effect of CC has on pastoralist communities, by concentrating on the systems, these studies treat the community members as a homogenous group of individuals equally vulnerable affected by the impacts of the changing climate on the livestock-livelihood systems. However, there is a need to recognize the socio-economic heterogeneity within collectively managed pastoral systems, which as highlighted by Adhikari (2001: 23) may include: "differences in opportunity cost, appropriation skills, caste, gender, language, ethnicity, initial endowment, political influence, technology and local differences", and therefore the difference in adaptation ability between different individual/households. An example of a form of socio-economic heterogeneity is the unequal degrees of access to, or control over collective resource because a group or individual has political dominance over another (Adhikari & Lovett 2006). A research conducted in Nepal focusing on the relationship between household socio-economic characteristics and income from community forests showed that the middle income and the rich households gained more from the forests than poorer households (Adhikari, 2003). Similarly, the impacts of climate change among pastoralist are likely, for instance, to be felt more strongly by the poorer than the rich, i.e. people with few resources than those with more respectively. Whatever the form, socio-economic heterogeneity has an influence on the level of vulnerability to CC impacts among different households/individuals in a pastoralist community. Three forms of heterogeneity important to understand in a community include: socio-economic status (wealth), gender, and age.

On a different note, as pointed out by Adger and Kelly (1999: 253), vulnerability is "...a socially constructed phenomenon influenced by institutional and economic dynamics". Livelihood dynamics among pastoralist such as Kenya's pastoral communities who are undergoing a tenure transition have a significant influence on households' and/or individuals' level of vulnerability and ability to adapt to CC. The tenure change, which is causing rapid livelihoods dynamics among the pastoralist groups, is in itself a contributor to the socio-economic heterogeneity. Ensuring a holistic CC vulnerability assessment framework, by including the existing socio-economic heterogeneity and tenure change related is imperative. As such, the tenure change influences inclusion in the CC vulnerability assessment framework, which comprises the *second approach* in this study. The notion of institutions is relevant to explore the tenure transition-livelihood dynamics effects in the context of CC impacts.

2.1. Institutions

Institutions are defined as “systems of rules, decision-making procedures, and programs that give rise to social practices, assign roles to the participants in these practices, and guide interactions among the occupants of the relevant roles” (IDGEC 1999). They are fundamental in mediating CC impacts, particularly the adaptive capacity aspect (IPCC 2007; Agrawal et al. 2008; Gupta et al. 2010). They structure how the negative impacts of CC affects livelihoods in rural areas through their “...indispensable functions: ...information gathering and dissemination, resource mobilization and allocation, skills development and capacity building, providing leadership, and networking with other decision makers and institutions” (Agrawal et al. 2008: 1). Furthermore, it has been maintained that institutions dictate the flow and distribution of external adaptation support among different social groups as well as linking the local people to national policies and interventions (*Ibid*).

In pastoral communities, two forms of institutions: *enabling and constraining*, exist under the changing *communal tenure system* that are essential to adapting to CC impacts. North (1989: 1322) is known for establishing the notion of constraining institutions, which he referred to as “rules, enforcement characteristics of rules, and norms of behaviour that structure repeated human interaction”. Social capital, which refers to the “features of social organization such as networks, norms and social trust that facilitate co-ordination and co-operation for mutual benefit” (Putman 1995: 67) constitute the key enabling institution. These institutions are recognized as having the capacity to manage highly variable and unpredictable climate (Nassef et al. 2009). Following the tenure change among Kenya’s pastoralists, which is an institutional change in itself, customary institutions are changing to privatize ones, a change that needs to be identified and understood to access the new tenure system influence on local people’s mediation on the impacts of the changing climate. A better understanding of how the institutional change following tenure transitions affects (benefit or disadvantage) local people in different social groups in the community including women, youth, the relatively poor and the like, is critical to establish how privatization influence climate change impacts, as well as local people’s ability of to adapt to the impacts.

The *sustainable rural livelihood framework* (Scoones 1998) is adopted here to explore how the tenure transition related institutional changes among the Kenyan pastoralist communities interacts with CC impacts. A livelihood is considered sustainable “when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base” (Carney 1998: 7). Sustainable livelihood approaches in development have gained strong popularity over the last two decades, starting from 1990s, to an extent where they are dominating the programming and organizational structures in many development agencies (Chambers & Conway 1992; Scoones 1998; Ashley & Carney 1999; Carney 1998; 2002). Currently, livelihood approaches are applied widely in every development area including livestock, fisheries, forestry, agriculture, health, urban development and more (Scoones 2009). Interestingly, even responses to complex emergencies - issues of conflict and disasters, have taken a livelihoods lens (Cannon et al. 2003; Longley & Maxwell 2003). This study acknowledges the criticism on livelihoods perspectives, one particularly relevant to the tenure change-

livelihood dynamics issue researched in this study: *the tendency of the approaches to failure to deal with long-term change* (Scoones 2009). As highlighted by Scoones (*Ibid*: 189-190), a livelihood analysis is limited to one way of thinking about the long-term change, but, different people, because of their current asset base and livelihood options, are likely “...to end up just coping, moving to new livelihood options or getting out completely”. This crucial aspect of livelihoods perspectives is exemplified by Dorward et al. (2005) as distinguishing between stepping in, up or out.

Tenure change influence how the local pastoral livelihoods cope with the climate change (shocks and stress). The figure 2 below provides a reconstruction of the framework to fit the tenure situation-livelihoods dynamics in the context of climate change.

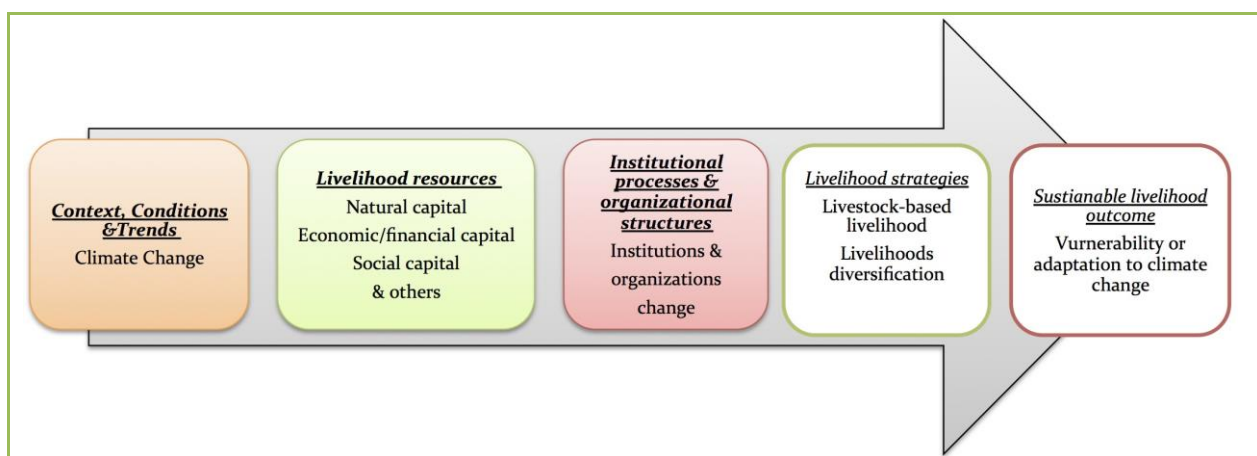


Figure 2: Sustainable livelihood framework. Reconstructed from (Scoones 1998)

In the figure 2 above, the *natural capital* refers to the natural resource stock available to an individual household to attain livelihoods - land and land resources. In this study context, *financial capital* includes available financial resources - credit, remittances, social security payments that provide people with different livelihood options. *Social capital* refers to the social relationships - networks, group membership, trust and the like that aids people in livelihood pursuit (IISD, IUCN, SCI 2003: 12). Two other forms of capital are comprised of: *human capital*, which includes skills, knowledge, ability to labour and good health essential to livelihood activities; and, *physical capital*, which comprises the basic infrastructure for transport, buildings, water management, energy and communication available for pursuing livelihoods (*Ibid*). Climate change impacts influence livelihood resources, in turn the institutional process, both formal and informal institutions and organizations – drawing from the figure 2, influence access to the livelihood resources and thus mediate ability to achieve successful livelihood strategies or otherwise (*Ibid*), and hence mediation on CC impacts.

2.2. Gender, tenure transition and climate change

Gender is a critical aspect in the matters of CC (UNFCC 2014a). *Gender analysis* is an essential tool for identifying, understanding as well as describing the differences in gender, including gender roles and power dynamics in a specific context (USAID 2011; World Bank 2014a) – in this case CC. Several key interconnected gender domains as listed by USAID (2011) are essential to recognize: the difference between men and women in terms of access to necessary resources; knowledge, beliefs and perceptions, practices and participations; availability and allocation of time and the locations in which time is spent; legal rights and

status; power and decision making. These domains determine how men and women are differently impacted on by CC.

Although women play a bigger role in rural life, particularly in relation to food production, (incongruously) men enjoy more rights and access to the production resources (World Bank 2014b). This has implications on women's ability to cope with problems of CC. For instance, in Africa, despite representing 80% of the agricultural sector, due to overwhelming gender inequalities (along some of the presented domains), women are vulnerable and poor (Denton 2002), thus they have less capacity to adapt to CC impacts. Under customary tenure, the Maasai women have no primary rights to land, only secondary rights whereby access to land and land resources are through men (husbands), male kin (parents or relatives), or traditional authorities and governing assemblies of elders (Archambault & Zoomers (n.d.)). Besides issues of unequal access to resources for women within customarily tenure arrangements, there are other ways in this set up that leaves women vulnerable by losing access; in case of the death of the husband or divorce; where a woman is never married or is in an informal union (*Ibid*).

The gender roles and power dynamics are changing among Kenya's pastoralist communities following the transition from customary to private tenure system. The changes have implications on the issues of CC, and therefore, needs to be clearly understood.

3. Methodology

In this chapter, this study methodology comprising the research question operationalization, study site selection and description, the research process and finally the reflection on research and experiences, is presented.

3.1. Research questions operationalization

From the main research question:

In what ways does pastoral land privatization influence climate change and the local people's ability to adapt to the impacts?

There are two main research elements – climate change and land privatization in pastoral communities. In order to establish the influential link between the two elements, it was imperative that both be studied separately. This informed the first two research sub-questions:

1. *In what ways does climate change impact on pastoral communities, and what are the local adaptation strategies to address them?*

Climate change impacts among pastoral communities are felt through historical weather variations, which in turn affect the local availability of the limited and heavily depended on water and pasture resources in a livestock production system (pastoralism). These effects of climate change were to be analysed from a social-economically heterogeneous community member's lens, because people are differently affected by climate change impacts. As would be expected, pastoral communities members are establishing adaptation strategies within and outside pastoralism. The responses within pastoralism include ways to ensure continued access to water and pasture resources for the livestock. Those outside pastoralism comprise the possible diversification outside pastoralism, which are available to different local people. All these aspects of climate change need to be explored to understand how land privatization interacts with them, thus the third sub-research question:

2. *What are key the issues surrounding land privatizations among the Maasai?*

Pastoral land privatization is a highly contested issue due to its negative influence on pastoralist communities, particularly by reducing access to water and pasture resources that are limited and spread-out across the landscape. Nonetheless, it has also been advocated for in among pastoralists as an essential reform to increase socio-economic productivity. As such, to understand the influence of the tenure change on climate change, the outcome of the presentation on pastoral communities need to be understood first. The link between land privatization is established by looking into ways in which the positive outcome of privatization promotes community members ability to adapt to climate change impacts, and now the negative impacts affect people's ability to adapt or enhance the negative impacts. Hence the following two sub-questions:

3. *In what ways does pastoral land privatization enhance the local people's ability to adapt to climate change impacts?*

4. *In what ways does pastoral land privatization exacerbate the problem of climate change and/or undermine the local people's ability to adapt to the change impacts?*

In this study, it is presumed that some aspects of pastoral land privatization enhance the negative impacts of climate change and at the same time undermine adaptation capabilities, which need to be addressed, and thus the last sub-question:

5. *How can the negative influence of pastoral land privatization on climate change impacts and the local people's ability to adapt to the impacts be addressed?*

3.2. Research area selection & description

This research was conducted in a semi-arid pastoral community in Kenya, Maji Moto (MM). The community was chosen mainly because of being a recently privatized group ranches in the county and that the process of subdivision was highly contested, which made the region ideal for this study. Furthermore, the study host organization: *the Indigenous Livelihoods Enhancement Partners (ILEPA)*, is active in the community. ILEPA played a crucial role in this study by assisting with the logistics and in identifying relevant research participants.

MM is a Maasai community located at 1° 20' 0" South, 35° 43' 0" East, adjacent to one of the most popular tourist destinations in Kenya - Maasai Mara National Reserve (MMNR) in the South. It is part of Osupukio division, Narok County, in southern Kenya (*figure 3*). The region covers a total of 492 km² or 120,607.63 acres (48,929 Ha)³. Conventionally, the regional temperature ranges between 17.7°C– 19.9°C, and has an annual average rain of 600mm⁴. According to the Government of Kenya Census, 2009, MM has roughly 10,000 inhabitants (Riamit 2014). They are predominantly Maasai. The rest of the population comprises a few members of other ethnic communities, mostly working as civil servants within the public facilities – schools, dispensaries, running shops and providing casual labour in the irrigation plots.

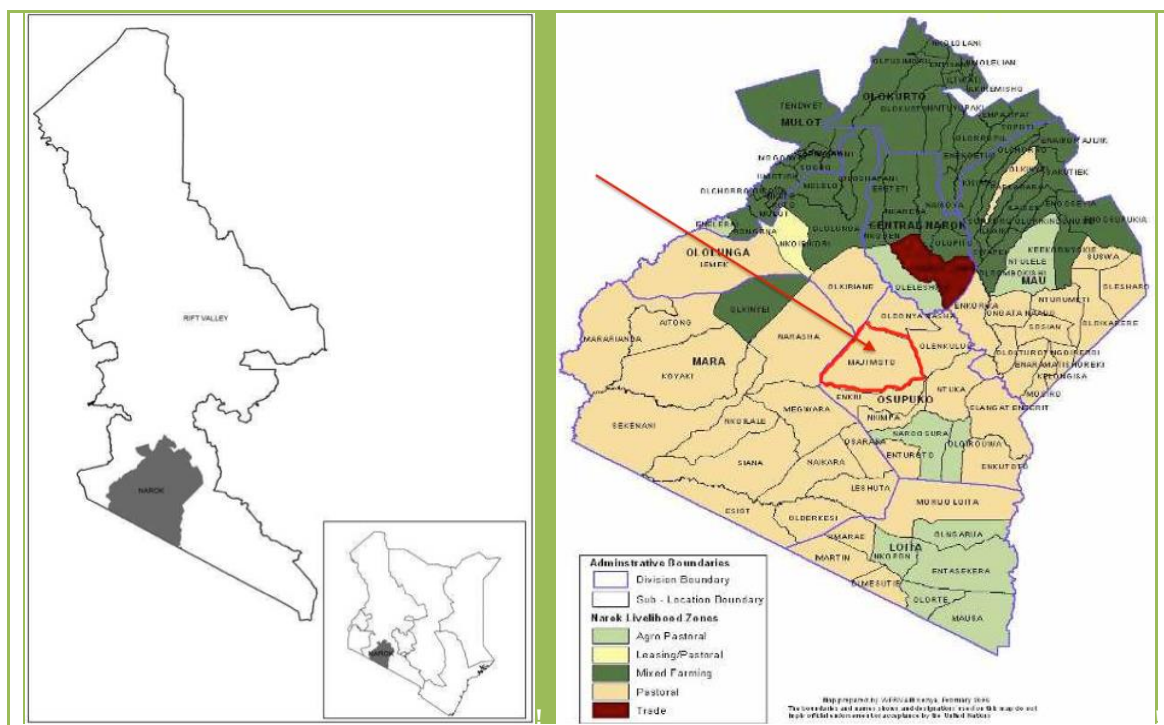


Figure 3: Map showing Maji Moto location in Narok County, Kenya (NEMA n.d.)

³ Green Card (Pre-cursor of MM group ranch Title Deed (cf. Riamit, 2014)

⁴ PRA Report, Ministry of Agriculture, 2000 (cf. Riamit, 2014)

3.3. Research process

The research adopted a qualitative outlook, combining descriptive and explanatory approaches. It is based on three months of fieldwork, carried out in two phases. The first phase: orientation/explorative research was done in the first two weeks, which comprised a few informal interviews being conducted with the host organization on how to best approach the study area. This stage also informed some of the open-ended questions (see *appendix 1*, the lead questionnaire) that guided the data collection process. The second phase involved the sample selection and data collection process. After the fieldwork was ended, the data was analysed to produce this report.

Study participants, research methods and data collected

The primary participants of this study included four key informants and 31 community members in MM, most of whom are predominantly dependent on pastoralism and two local development experts working in the local government organization. The information from the key informants was of great significance to this study given the sensitivity of the topic of land in the study region where MM residents were shy to share such issues on the subject. The key informants were ‘educated’ members of the MM community members believed to have strong knowledge on both the issue of land subdivision and climate change in MM, particularly due to their active involvement in these issues through their occupations. The author employed a spatial-quota sampling technique to pick the sample of the local participants. The list of the participants randomly chosen from three age categories – youth, adults and the elderly from both genders. The categorization was hoped to generate varied responses for the study topics. The local participants were from three different villages spread-out across the landscape to ensure a wide representation. For the focus group discussion, given that people live in small villages, as already mentioned are spread out, it was not possible to invite participants to a central place, but to go to a specific village and do the focus group discussions there. The author managed to organize only two focus group discussions, because in some cases people demanded compensation to participate, which could not be afforded. They (focus groups) comprised 8 male youths and 9 women. The youth and women were chosen because they are part of the social group most affected by privatization. Youth, because as seen in other areas, they were either not allocated land, and/or are differently affected by privatization than older people, especially on how they see pastoralism as a livelihood. Women because privatization changes their socio-economic roles in the community. It was not possible to mix gender in one interview as it is considered culturally inappropriate in a Maasai community. The table 1 below provide an overview of everyone engaged in this study.

48 Local participants	4 Key informants	2 Government’s institutions participants
6 adults male	2 Male local development expert	Female expert from NDMA - Female
8 elderly male	Youth development expert	Male expert from NEMA
7 adult female	1 local business-person/elite	
11 elderly female		
3 youth male		
2 youth female		
8 male youth focus.g		
9 women focus.g		

Table 1: Research participants

A combination of four qualitative research methods was employed in this research: *literature review*, *focus group discussions*, *informal & semi-structured interviews*, and *participant observation*. As part of participatory rapid, conducting focus groups and participant observation was endorsed in this study due to its significance in identifying crucial local system impossible to ascertain in advance (Beebe, 1995). Additionally, focus group discussions offered room for the establishment of a local multidisciplinary team as well as the possibility to combine previous available knowledge with the present information.

To explore both the issues of the group ranch privatization, and climate change, secondary data was gathered through a literature review of the academic journal and reliable publications and websites by the Kenyan government and NGOs, as well as reports of the research conducted in the study area were conducted. The primary data included informal and semi-structured interviews with the locals, key informants, and two focus group discussions were conducted. Alongside collecting the above information, to avoid double work the interviews and the focus group discussions also assessed the influences of the interaction between the group ranch privatization and climate change, including establishing how the negative influences (if any) from the interaction can be effectively addressed. Participant observation was employed to follow up on the sensitive physical changes in the community members' access to land resources following privatization. During the fieldwork days, the author was keen on exploring the physical changes across the landscape. Any observation made was recorded. The target was mainly to establish how tenure transformations had affected the respondent and/or his fellow community members in terms of land resources accessibility and/or availability.

Data analysis and report writing

Upon transcription of the interviews (not conducted in English), and focus group discussions, the primary and secondary data collected was reviewed in various categories to answer the research questions. Codes were developed to help structure the study findings. All the data collected was confidential and was treated as so when writing this report.

3.4. Reflection on research and experiences

There are four crucial limitations to be recognized in this research. First, besides those conducted with key informants (which were in English), all the other interviews in this study were conducted in *Maa* - the local Maasai language not spoken or understood by the author. Therefore, the study relied on a local translator, and thus there is a possibility some significant part of the data might have been lost during the translation process. Second, the study period was short. Three months is not an adequate period of time to gather extensive information on the research subjects. Four, for both topics covered in this study, basic details researched relied on the memory of the participants; some of the elderly participants found it challenging to provide some details on various aspects of the study subjects. Lastly, a limited budget available for this research made it difficult for reaching all pre-planned engagements, for instance the cases of refusal by some members to participate in focus group discussion without some compensation, meant less data collected.

Despite the outlined limitations, the information presented in this report offers relevant knowledge about critical topics of land privatization and climate change among pastoral communities in Kenya.

4. Experiences and perceptions of climate change in Maji Moto

Although there is little quantitative data exposing the presence and the extent of CC in Maji Moto (MM), this chapter relies on qualitative data to show impacts of the changing CC are being experienced, and are having implications in the region. The case is based on experiences and perceptions community members have about CC, particularly people’s testimonies and anecdotes, it appears the threat of CC has caught up with MM residents. Before presenting the case of MM, the chapter will build on the available information on the CC impacts within global level as well as in Kenya ASALs.

4.1. Climate change, ASALs and pastoralism

Despite the on-going efforts to reduce and mitigate the effects of CC through reduction of greenhouse gases (GHGs) (see UNFCCC 2014b), the earlier emissions present unavoidable impacts, hence the need for adaptive measures as pointed out by IPCC (2007). Figure 4 below provides a summary of the key impacts of the changing climate.

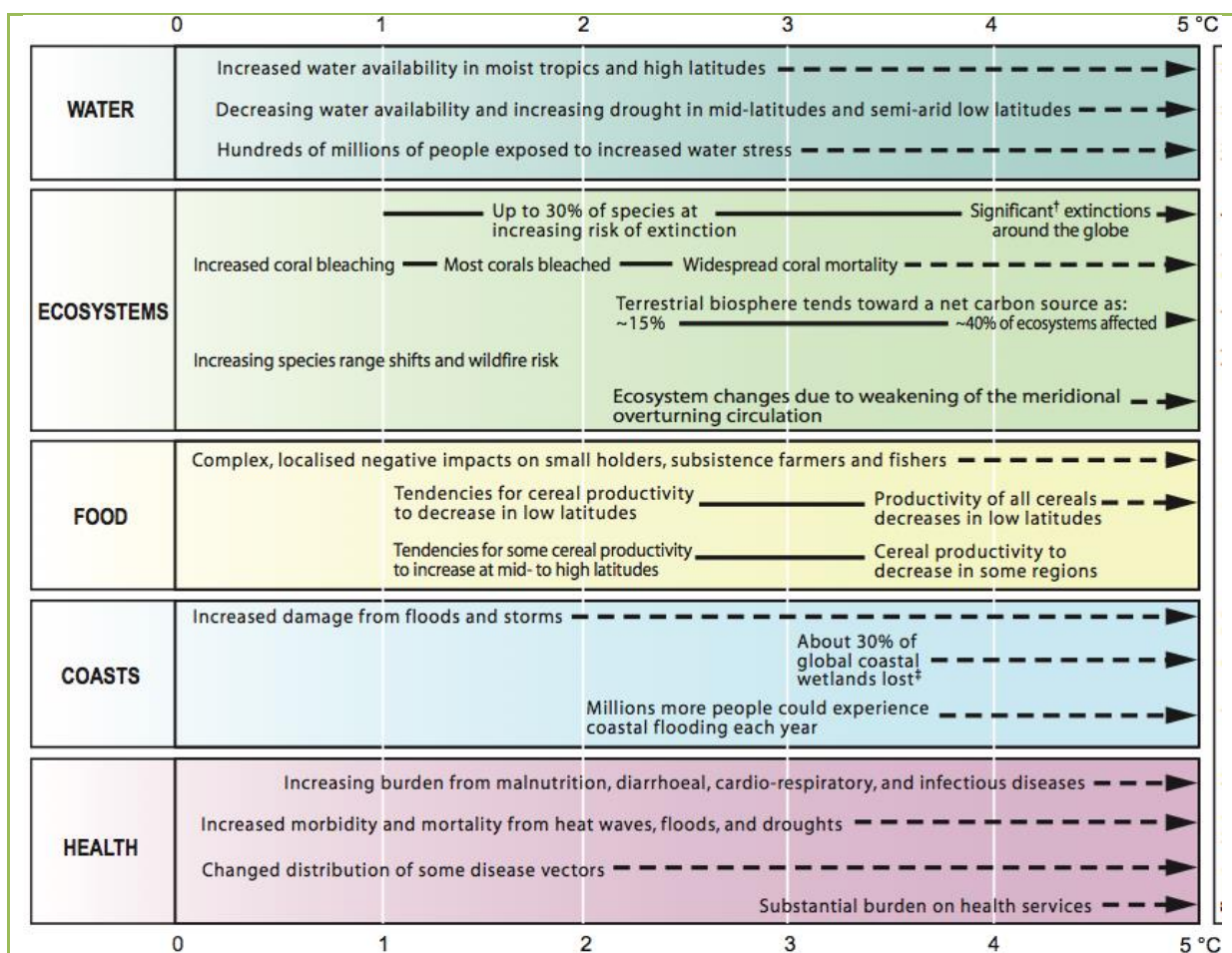


Figure 4: Key climate change impacts (IPCC 2007)

Intriguingly, there are some positive gains attributed to the changing climate, but the overwhelming majority of the impacts are negative. The positive impacts as indicated in the figure 4 comprise: increase in the availability of water, ecosystems gain, and the increase in crop productivity in some regions. The negative impacts include: an increase in water stress, floods, decline in crop productivity and health related problems e.g. increase in disease vectors such as malaria. As indicated earlier, the CC impacts are/will not to be

equally felt across the world. Furthermore, the poorest and least capable to adapt – such as Africa and Asia - will be affected the most. According to the IPCC (*Ibid*), in *Africa*, an estimated 75-250 million people will be exposed to water stress; by 2020, rain-fed agricultural produce is expected to drop by up to 50%. Overall, the effects of CC may severely compromise agricultural production. Due to heavy reliance on agriculture (in which 95% is rain-fed in Sub-Saharan Africa) for food and income (SSA) (World Bank 2013), the negative impacts of CC puts the livelihood of many in great jeopardy. In Central, South, East and Southeast Asia, a decline in the availability of freshwater is foreseen by the 2050s; Morbidity and mortality rates from increased flooding and droughts are also expected to increase (IPCC, 2007). In Southeast Asia, the rise in sea level threatens the large population that depends on the coastal livelihoods. Besides the direct impacts on population and livelihood systems, the climate change is also feared to thwart the promises of the Millennium development Goals (IPCC, 2007) e.g. increased flooding destroying social infrastructure already put in place. Elsewhere, as discussed by USAID (2013) in the report on *Climate Change and Conflict in Africa and Latin America*, CC has been linked to the conflict because of increasingly CC-induced scarcity of resources such as water. Conflict will only add a burden means to acquire livelihoods.

In the global Arid and Semi-arid lands (ASALs), CC threatens the livelihood of the large number of pastoralist communities found in these regions. As seen earlier, ASALs occupy 41 % of the global land. In Africa, pastoralism up to 40% of the continent's landmass. Across East Africa, ASALs occupy 70% of the land in the region covering: 30-60% of the total land in Tanzania, 60% in Uganda, 95% in Somalia and Djibouti combined, and 80% in Kenya (Oxfam 2008b). Kenya's ASALs are home for approximately 30% of the country's 45 million people (UNEP 2009; CIA 2014).

Conventionally, ASALs periodically suffer from droughts, irregular patterns of little rainfall (up to 700mm per annum), and a high rate of potential evapotranspiration (CASL 2014). Therefore, resource scarcity, particularly of water and pasture, is a common challenge in ASALs. However, as a result of the changing climate, the temperature, rainfall and droughts, the problems of water and pasture are bound to intensify. In the area already affected, longer lasting droughts are expected to increase by 25% as this century ends, according to FAO (2009). This will have adverse implications on water and pasture availability for livestock production. It is also established that the change in rainfall (decrease) and temperature increase plus a rise in the CO₂ concentration will reduce livestock productivity in the ASALs (IPCC 2007). Some of the effects are already being seen. A study by Woodward and Lomas (2004a; 2004b) indicates a decline in the vegetation cover and productivity in Southern African savannah due to experiment-verified 8-mm/year drying trend since 1970. In East Africa, it is estimated that the number of people that die or are severely affected by droughts annually increased by ten times from 1974 to 2003 (FAO 2009). Despite their unique ability to adapt to and cope with variable climatic conditions in ASALs, it is evident that pastoralists are becoming increasingly vulnerable to the intensifying climate variability.

Kenya's ASALs have recorded an increase in recurrence and intensity of drought, which have become an (almost) annual occurrence due to climate change, as reported by UNDP (2013). Although droughts are

common in ASALs, the four droughts experienced over the past decade have led to significant loss of livestock and to the impoverishment of many families. As further indicated by NEMA (*Ibid*), the change has led to a decline in forage availability and increase in the incidences of disease (NEMA 2011). It is also important to note that these impacts of CC have prompted the Kenyan government and local and international NGOs to engage in various activities aimed at mitigating and adapting to the change. In 2010, a National Climate Change Strategy (NCCRS) was launched in the country with the aim of coordinating climate change activities (GoK 2013). The list of international organizations in Kenya's CC activities is extensive: World Wildlife Fund (WWF), International Union for Conservation of Nature (IUCN), Birdlife International, Care International, Action Aid, World Vision, Oxfam, International Institute for Sustainable Development (IISD) and International Development Research Centre (IDRC), World Agro-forestry Centre, and United Nations (United Nations) (Hepworth 2010).

In spite of the increased involvement of government, local, and international organizations, there is barely any literature that sheds light on issues of the changing climate in Kenya's pastoral ASALs communities. Below, the case of MM climate change contributes to such needed relevant literature.

4.2. Historical weather and pastoralism in Maji Moto

Historically, as informed by Riamit (2014), MM experiences four distinct seasons annually: the long rain season that lasts from March to May, the short rain season from November to December, the long dry spell that occurs between July and October, and the short dry spell which lasts from January to July. June and July, December and January are the coldest and the hottest months of the year, respectively. The region receives on average 600mm of rainfall annually (*Ibid*). The minimal rainfall is erratic across time and space, typical of ASALs. Thus, the vegetation cover includes: dominantly semi-arid savannah grassland, an estimate 55%, thickets – “evergreen and semi-deciduous bushland”, and a very small forest spreads over 35% (Riamit, 2014; Archambault et al. 2013: 70). The region comprises of two distinct ecological features: (Loita) plains mostly in the northern areas and hills in the southern parts bordering Loita Hills which are part of the Western wall of the Rift Valley (Archambault et al. 2013). Interestingly, due to the proximity to MMNR together with similarities in the climatic conditions and vegetation, MM sees an abundance of wildlife, especially during the long rains. Wildebeest, zebras, buffalos, gazelles, antelopes, hyenas, elephants as well as others pay frequent visits when they use the community land as their migration corridor.

Access to water in MM is a daily struggle. There are only a handful of water sources: two permanent springs – *Enkare Nairowua* (MM hot spring) and *Enkoyankalani* a few shallow wells and seasonally available springs and rivers. Access to these public sources is open to all members. This thesis author also witnessed a non-functional borehole in one of the villages visited. Sometimes a group of villagers or neighbours team up to dig water pans - *siranke* - prior to or during the long rain season. Those who do not participate in digging these water pans can only get water for domestic use, not for their livestock. To ensure convenient access to scarce water resources, it is not surprising that the majority of the population in MM are concentrated around the permanent water sources where limited social facilities (schools, health centres, churches, shops) can also

be found. The highest number of people in MM lives in and around Maji Moto centre, located next to *Enkare Nairowua* (Riamit 2014).

Before the introduction of the Group Ranch (GR) model by the Kenyan government in when 57 group ranches were established around 1979 throughout Kenyan pastoral areas (Mwangi 2007; Kibugi 2002), MM was part of the vast landscape belonging to various Maasai communities in Southern Kenya. MM was declared an adjudication section (a GR) by the then Narok district Land Adjudication officer on May 1977⁵ and in 1978 under the Group Representative Act⁶. As indicated by Archambault et al. (2013: 62), the overall objectives of the group ranch scheme were: “protection against land degradation due to overstocking, commercialization of livestock production in pastoralist regions, and equitable allocation of resources as a means to prevent landlessness and fragmentation of rangelands beyond viability for livestock husbandry”. As highlighted by Ayantunde et al. (2011), the policy supporting the move to establish GRs was informed by Garret Hardin’s thesis “Tragedy of the commons” (Hardin 1948) in which pastoralism is viewed as mismanagement of rangeland resources and contributes degradation through overstocking and overgrazing.

Notwithstanding confinement within the GR, throughout the past, the Maasai of MM have maintained pastoralism as their chief livelihood strategy; accounting for 88.9 % of the households (Archambault et al., 2013). The natural resources within the GR have been collectively managed. To ensure access to the exceedingly variable (in time and space) water and pasture resources, they have relied on this widely acknowledged livelihood system (see Behnke 1994; Mace 1991; Thebaud & Batterbury 2001), which qualifies as a form of community-based natural resource management popular among commons theorists (Ostrom 1990; Baland & Platteau 1996). Three features central to pastoralism have been key to continued success: mobility, social capital, and socio-cultural rules and norms. They all reinforce each other. *Mobility* has several key roles. First, it “promotes optimal utilization of spatially heterogeneous availability of forage and water resources” (Ayantunde et al. 2011: 31). Second, it is recognized as an important tool to avoid degradation. By moving seasonally, pastoralism allows for pasture restoration in the regions already grazed (Nori et al. 2008). Third, mobility is central to establishment of *social capital* whereby during the movement “...people can meet potential partners, marry and otherwise extend and reinforce the social ties” that are “instrumental to negotiate resource access and manage disputes through the principle of reciprocity” (Fernandez-Gimenez & Le Febre 2006: 343; Nori et al. 2008: 148). A fitting example of reciprocity is when one group allows others to graze within one’s territory during drought conditions (Fernandez-Gimenez & Le Febre 2009). As informed by Galvin et al. (2008), the Maasai and other pastoral societies rely heavily on social networks among individuals and groups to govern their natural resources. The clan, age-set as mentioned by Grandin (1991), group ranch membership, and even ethnicity (Maasai) are all part of the social capital which helps establish cross-links that promote coordination and cooperation with and of natural resources among pastoralists. In MM, social capital has been an important tool to access pasture beyond the GR territory.

⁵ Declaration notice MM adjudication section [LA/5/1/82/5,1977] (see Riamit, 2014)

⁶ Archambault et al. (2013)

Socio-cultural rules and norm have a special place within pastoralism. Under communal land ownership, such as in the GR setup, and due to the harsh environmental conditions in MM, there are traditionally established rules and norms that define the interactions of individual members towards the utilization of natural resources. To exemplify, pastoralism involves establishment of highly protected grazing reserves as a back up for dry seasons or extreme cases such as severe drought ((Fernandez-Gimenez & Le Febre 2009). Those who fail to adhere to this arrangement face punishment through sanctions. These rules and norms are understood and respected and are huge contributors to the Maasai's survival in variable and unpredictable environments.

4.3. Historical weather changes and related impacts due to climate change in Maji Moto

Regardless of the huge capacity pastoral livelihood system has in the environmentally harsh regions, based on the case of MM in this study, climate change is proving to be a significant burden. The change in climate, manifested through the changes in the conventional seasons and weather patterns, has instilled major concern in MM. Although most MM community members do not have a broad knowledge of the nature of the changing climate e.g. causes and future expectations, every participant in this study indicated that they had noticed a change in climatic conditions in the region.

The first change experienced entails *the rain pattern*. The entire team of participants pointed out that, presently, the rain pattern is extremely unpredictable, unlike in the past. Many MM residents appear to be worried over the changes in the rain pattern. As expressed by a respondent 17 (adult/male) in an interview, “the usual period of rain in the region is March through May, ...but this year (2014) for instance, it has been raining in January which is very unusual”. An interview with respondent 30 (elderly/female) stressed a sense of confusion over the change. She and others stated that in “the time you expect rain, it is dry and the usual time we expect rain, there is no sign of it”. As learnt from key informant 04 (local adult male development expert), traditionally, besides during drought periods, the region has experienced consistent seasonal shifts that most of the members are familiar with whereby rainfall (though maybe varied in time and space) is expected during specific months of the year. According to him, it is hard not to notice the usual pattern no longer exists, a change that alarms everyone in the community.

Decline in the *amount of rain received* is the second change witnessed. Historically, during the long rain seasons (spanning March through May as mentioned above) - with the exception of drought periods - it was specified by various study participants that the community enjoyed plenty of rain that saw seasonal rivers flow and springs filled. However, in present days, this is no longer been the case. Nearly all the interview respondents indicated that the rain was much less in the long-rain season, making it to be mostly dry. In an interview, an adult adult/female respondent (25) stated that, “nowadays, rain is very short, happens for a short period like one month and not consistently through the long rain season”. In a focus group discussion with the youth, the participants expressed their distress over the matter saying that it was almost dry throughout the year.

The third change felt is the steady increase in incidences of *drought*. The interval between one drought and the next has narrowed. Two words dominated the talk regarding droughts: persistent and frequent. Clarifying the change, key informant 02 (local youth development expert) specified that the traditional interval of droughts – a period of about 10 years - had shrivelled. He also said that, like the rain, droughts were also unpredictable, a claim that was shared by many in MM. A drought expert from the Kenya National Drought Management Authority (NDMA) affirmed this information in an interview on the issue, maintaining that the change commenced in the early 1990s. Starting from the 1990s, the region witnessed drought in 1992, 1997, 2001, 2005, 2007, representing 5-4-4-2 years' gap respectively. Such narrow intervals suggest a more intense experience of the drought that many study participants argued.

Temperature rise is the fourth noticeable change and the last one mentioned during the study. While the region undergoes a period of high temperatures in the months of December and January, it was stressed that presently, the community is experiencing a gradual rise in temperature outside these months. Many study participants reported that it was hotter than usual in the usual hot months. Furthermore, a similar change is experienced during the months expected to be cold, including June and July.

Even though the community is aware of the climate change, there is still a significant gap for a broader understanding of the phenomenon, especially basic knowledge of the root cause of the change and its long-term implications. Most of the elderly respondents - particularly those with strong religious beliefs - eluded the change was supernatural, hence beyond understanding. Quoting an elderly/male (respondent 12), "...*God* has brought these changes, ...they are beyond human understanding". Even more interesting, an elderly/female (respondent 19) claimed that the change was an outcome of the work of *Satan*, and that by praying *God* solution will be found. It was only a few respondents such as the youth who had finished secondary school and those in college who could link climate change to industrial development. Religion-wise, the Maasai pray to either the Christian *God* or the traditional Maasai deity – *Enkai*. It is not surprising that those with such religious backgrounds believe that the change in climate is supernatural, especially given the complexity of the CC phenomenon, which is still a topic of debate among the educated, in terms of the nature and causes. During the study, many indicated that no information on the issue has been provided in MM.

Impacts on water and pasture resources

The Maji Moto community has indeed witnessed a change in their traditional climate conditions, but has there been any attributed implications? According to the interviews and the focus group discussions, there is one overarching impact: water and pasture. As already pointed out, MM is a semi-arid region which endures unpredictable low rainfalls and droughts, but the significant reduction in the amount of rain received annually, plus persistent and increased frequency in drought due to climate change has resulted in substantial reduction in the availability of water and pasture.

As indicated earlier, MM has had two permanent springs, a few wells, and seasonal sources accessible during and for a considerable while after rainy periods for domestic and livestock use. Because of less

rainfall attributed to CC throughout the recent past, the seasonally available rivers and wells have dried out. This drastic change has forced many community members, particularly those living away from the two permanent sources to travel long distances during dry periods that have become the norm in the region as informed by respondents 08 (adult/female) and 26 (adult/male), among others. Those living close to the MM hot spring, however, did not perceive water scarcity as a threat. Although it is hard to quantify the water level and the number of people it can support, the hot spring has continually provided adequate water for those located near. In an interview, a male/youth respondent (18) stated, “water is not an issue around Maji Moto centre due to the presence of the hot spring”. Not everyone among those study participants living close to the hot spring agreed with such a viewpoint. A number of them feared that the drying of temporary sources in the region would increase competition for water from the permanent ones leading to a decline in water levels, and consequently increased scarcity. Explaining his view on the issue in an interview, an elderly/male respondent (12) living around MM centre said that, “there is only one natural spring in this region and that cannot provide enough water for everyone. In the long run, competition for water from this single source will increase and will cause problems”.

Difficulty in accessing pasture for livestock is perhaps the most strongly felt impact from climate change in MM. Nearly all the study participants recounted a significant reduction in the amount of grass available for the livestock. While a number of respondents simply highlighted that there was inadequate pasture to support their herds, others were more detailed in this claim stating that grass did not grow as long enough as it used to in the past due to limited rainfall. It was also mentioned that besides not growing long in size, the grass also dried out quickly soon after the rain stopped. An elderly/male respondent (02) gave an interesting statement that summarizes the issue: “nowadays, grass comes up as fast as it dries out”. Such proclamation alludes that the community acknowledges that pasture is still available, in the event of rain, but it is unreliable for it is only available for a short duration.

In a response to illustrate the extent of the challenge for the community to acquire pasture, a common anecdote recurred during interviews with members and key informants. It was stressed that, presently, in unusual months people and livestock had ventured far to places the community had never been before in search for pasture. In the past, as indicated by key informant 04, the furthest MM community members went was to the nearby community and that happened only during the long dry spell or in the event of a drought. This is no longer the case. As indicated by an elderly/male respondent (28), “due to the on-going problem of pasture, we have been forced to migrate our livestock using lorries to distant places we’ve never gone before to find pasture”. This year (2014) and the previous year (2013), he said that he had sent his livestock to Nakuru. Access to land there at Nakuru is either through borrowing or renting or grazing illegally - at governments land. Other distant grazing venues as listed during the issue coverage included Naivasha, Maasai Mara, Mau forest, Keyio valley, and even Tanzania. It is crucial to highlight that this an expensive undertaking, in that it involves renting transport, renting pasture in some cases, and paying a fine in the event of being caught grazing illegally. Hence, it is only affordable for a handful of the MM community members, such as the rich. The rest - the majority - have to rely on ever declining pasture available in the region.

Impacts on health and livestock breeding

Many believe that an increase in prevalence of diseases affecting both human and livestock is linked to the changing climate. Alongside the change in climate, many diseases, barely named, had broken out. Many respondents complained about the fact that people in MM, "...had to visit the hospital several times for effective treatment" (elderly/male - respondent 02), which they considered an uncommon problem looking back several years. Although it is recognized malaria is a problem in the region, it was stressed that, presently, the disease incidences had increased due to the mosquitos' presence even in odd 'dry' periods. As informed by key informant 01 (local elite business person), "currently, malaria is a problem during both rainy and dry seasons but in the past, in the dry seasons, it was not a concern". While a technical approach needs to be taken concerning the malaria problem, it can be argued that the change in climate, i.e. a transformation of the weather conditions, has made it suitable for the mosquito to breed in both dry and wet periods. Other cases of human ailments are attributed to the problem of water scarcity. Diarrhoea, for instance, is due to consumption of "unclean water" as respondent 01 stated. Generally, there seemed to be little knowledge on diseases among the research participants. During the follow up on health challenges arising from the climate change, respondents 01 and 19 linked HIV and tuberculosis - new diseases affecting the community - to climate change, another sign of the obliviousness to climate issue. Little was brought up about the impact of CC on livestock diseases. While on the topic, key informant 01 indicated that "the frequency of foot and month, a common livestock disease, had increased, as there were cases 'every year, unlike in the past'".

A disruption of the livestock breeding process is yet another critical implication connected to CC. It was indicated that, traditionally, successful and healthy livestock breeding in MM relies on season variation. As informed by elderly/male (respondent 11), livestock breeding was set in such a way that the offspring will be born during the period where they will be able to access adequate forage and water. However, he says, due to the current problem of weather unpredictability, "calves have ended up being born during dry weather, affecting some cows while giving birth and making those calves that survive look premature due to starvation". It is arguable that CC is undermining the local indigenous knowledge critical for pastoralism. For quick reference, the table 2 below provides a brief summary of the heretofore-presented CC impacts in Maji Moto.

Impact	Indicators & effects
Water	Drying of seasonal rivers and well – water scarcity
Pasture	Little, less tall grass – pasture scarcity
Health	Increase in diseases incidences (human & livestock) – malaria, water borne
Livestock breeding	Disrupted timing – premature calves; cows dying while giving birth

Table 2: Summary of climate change impacts in Maji Moto

Overall consequences on community members' pastoral production and livelihood

Above all, the impacts of CC on the MM community members' livelihood are the most critical to comprehend. There is a general feeling in MM that due to climate change, extreme poverty is knocking on

most households' door. Given that livestock is a source of food as well as income (when sold or exchanged they and/or their products pay for basic needs – grains, tools, clothing and medical treatment) (Barrett & Luseno 2004; Fratkin 1997), any impact on livestock production affects access to these fundamental necessities. The harsh pasture and water situation, diseases, and the breeding challenge outlined above have been found to affect livestock production negatively. In the aftermath, the community life has been troubled. As mentioned by a male/youth respondent (26), “when livestock get affected... people get affected too as we rely on livestock for everything”. The severe wave of poverty is advancing in MM due to climate change and can be illustrated in three ways. One, the loss of livestock: animal starvation due to limited access to water and pasture. There have been cases of herds' deaths as highlighted by an elderly/female respondent (04). According to an adult/female respondent (19), recent incidences of droughts have claimed a substantial number of the community livestock. As informed by Mayiani (2013) the 2008-2009, drought claimed approximately 95% of the livestock from some regions in southern Kenya. This affirms mention situation of decline in livestock in MM that is linked to CC.

Milk and meat from the livestock are crucial nutrition elements in MM, and in basically all pastoral communities. In addition to the decreasing number of livestock, which affects meat availability in MM, it was stressed that due to lack of enough forage, the amount of milk produced has declined. There is a widespread complaint in MM about the decline in the amount of milk produced by the livestock, compared to the past, as expressed by an elderly/male respondent (23). The same applies to meat. The CC-related impact on milk and meat availability threatens food security and is causing hunger in the region. Increased incidences of droughts have been a major reason for food and water donation to support communities living in dry lands (McConnel 2010). The decrease in milk and meat – both Maasai staple foods - has been one of the reasons for the community to turn to foreign foods such as cabbage, ‘*ugali*’, rice, and other cereals. Other contributing factors to this change include: formal education - which is central to the on-going social changes in the region - and interactions with non-Maasai people while trading in livestock as was indicated by various study participants.

The impacts of CC on MM livestock based-livelihoods also extend to the livestock and livestock products market. Present-day starved livestock fetch small fortune in the market. MM residents feel that livestock in the region no longer grow big or fat enough compared to how they used to in the past due to limited forage. Thus, livestock ends up selling at a loss in the local markets. This aspect, as many maintained, is also a key contributor to food shortage. Other negative effects on various aspects of life in MM: difficulty paying for school fees, health care, clothes and other basic needs.

Generally, fewer livestock puts pressure on the MM community members' livelihoods, especially among the majority poor with few livestock. As informed by many during this study, those with larger herds are better off, since even in the event of a death, they still have some livestock left to depend on. The death of the few livestock among the poor leaves them with no means, unless they have other livelihood options (see the following section). It is imperative to emphasize that women are unfairly more affected by the problem of

the changing climate in MM than their male counterparts. Traditionally, women are responsible for fetching water for domestic use. This is still the case currently. With their children attending school, women are also largely involved in herding. Having to access scarce water and pasture puts more pressure on their daily life in comparison to men, who, in some extreme cases as lamented by an elderly/female respondent (16) “do nothing, but drinking alcohol”.

4.4. Adaptation to and/coping with CC impacts in Maji Moto

To adapt to and cope with CC impacts, MM community members have relied on approaches within and outside pastoralism. These include two previously presented unique pastoralism features, mobility and social capital, and local knowledge of herd management to ensure continued success of pastoralism. Diversification outside pastoralism – cultivation and income generating activities - has been a key contributor to dealing with the problem of CC. These responses are presented here.

Responses within pastoralism

As already indicated, pastoralism, at 88.9% predominates as a source of livelihood in MM. It is, therefore, not a surprise that all the participants in this study mentioned that mobility continued to be a significant strategy to access scarce water and pasture resources due to climate change. A more extensive migration with livestock in pursuit of limited pasture, within the ranch and further away from the community, as indicated earlier, has become a common thing. The open and free access for all - under collective tenure arrangement - allows for movement across the landscape, “tracking rain, and while doing so gain access to pasture in the regions that have newly received rain” as an adult/male respondent (10) put it.

Greater dependence on social capital has also ensured (better) access to the limited water and pasture resources through more coordination and cooperation among the Maasai within MM and with those from other GRs. The social capital complements the mobility element. This act of solidarity is strongly acknowledged by MM dwellers, as can be seen from the statement of an elderly/female respondent (04): “we have for many years worked in unity with fellow Maasai to share resources”. Explaining the lucidity behind the solidarity between distant Maasai communities, a youth/male respondent (18) says, “other communities living at far places cannot restrict us from accessing resources in their land. We face similar problems of water and pasture ... if they deny us, it will be them coming to us when faced by a similar problem in a similar occasion”. Social capital, as brought up in this study, is traditionally organized. Age-set/age-group systems⁷ and clan-ship are a crucial part of tradition that defines the division of labour for the pastoralist. Also, kin-ship – where a Maasai marries into a distant community (thanks to mobility) - establishes social ties necessary to access resources in distant lands. Part of the local solution to the challenge of water in dry season entails the community jointly digging a water pan “*Siranke*” in *Maa* near residential areas after long rains. The success of this process also owes to the coordinative and cooperative nature of Maasai community

⁷ Age-set - age group - is a form of kinship relationship in pastoral Maasai community. Community members in same age-set are considered closer in relations than those that are not.

discussed above. The digging of water pans plays a crucial role in dealing with the water challenge but it is only a temporary solution; the community resumes its distant searching when the pans' water levels get low.

Division of labour around how distant water and pasture resources are accessed is also based on an age-set system. Decisions on who go to explore distant land for water and pasture has been based on the age bracket a 'male' community member belongs to. The elders and/or adult men have been responsible for distance exploration for water and pasture in dry seasons, largely due to their knowledge and network. Once a place is found, the youth would then move with the livestock to graze as well as provide security. As pointed out by an elderly/male respondent (11), being young and energetic are two crucial attributes that make them the most appropriate group for the task, and, on the other hand, adults and elderly have more social relations than young people, hence they are responsible for the distant exploration task. Crucial to note is that the movement usually involves mostly livestock from a group of families, but an entire village at times when the weather conditions are too harsh.

As far as mobility is concerned, *mobile technology* as a tool has been replacing distance exploration for water and pasture by elders and/or adult men. As indicated by the majority of participants in this study, in the recent past, with the introduction of mobile phones, MM community members have secured the opportunity to reach out to other regions in the effort to establish water and pasture possibilities prior to moving their livestock. Illustrating the crucial role played by such technology, an adult/male respondent (17) stated that, "with mobile phones, it means a need to send people, hence we have been able to save time and energy. Mobile phones help reach out to distant relatives (married daughters, sisters, brothers, parents) and friends and check on resource availability prior the move."

Indigenous knowledge of managing livestock has inspired an interesting approach to deal with the increased scarcity of water and pasture resources: *change in herd composition*. The MM residents have embarked on keeping more goats and sheep instead of cattle, as they are easier to manage during dry periods. Besides being easier to feed, as they simply eat small grass and bush, goats and sheep are also easier to medicate (cheaper) and sell in the local markets, not to mention they grow at a faster rate than cows.

Responses outside pastoralism

As informed by Archambault et al. (2013), livelihood diversification has become typical practice alongside pastoralism among contemporary Maasai communities. Some Maasai community members of MM are actively involved in alternative livelihoods: crop cultivation and a wide range of other income-generating activities, which enhance CC adaptive capacity among those involved.

Crop cultivation

MM community members feel that introduction of crop cultivation in the region has become an important alternative source of livelihood. Cultivation in MM is limited to 836 acres owned in form of experimental irrigation plots (*appendix 3*) that were allocated to a few individuals, 2 acres each, in total 418 parcels (Riamit 2014). The irrigation project is a recent subsistence agro-pastoral project that uses water from the MM hot spring. Various types of crops grown in the plots include: maize, beans, peas, potatoes and

vegetables (sukuma wiki/kales, cabbage, tomatoes and onions). In case of surpluses, these products reach the local markets, and some (tomatoes and onions) even find their way to national markets. Although the irrigation benefits extend to the household members of individuals, it is crucial to highlight that the number of those who own the plots is equivalent to only 4% of the total MM population of 10,000 inhabitants. Future extension of the irrigation project is not likely as the water from the hot-spring cannot go very far and given the impacts of climate change, rain-fed cultivation is close to impossible.

Income generating activities

Various income-generating activities (IGA) indirectly (or not) linked to pastoralism or agriculture have been instrumental to coping with CC impacts in MM. A few participants in this study pointed out that IGA was an important source of livelihood in the community. The Archambault et al. 2013 study *Maasai livelihood pathways in Kenya*, indicates that around 45 % of the household in MM have a link to some form of IGA that are unrelated to pastoralism or cultivation. The different forms of IGA include people working at salary earning jobs such as herdsmen, teachers, tour guides, security guards, a sub-chief, a county council ECD officer, a waiter, and a dip-attendant; running small businesses such as shop owners (general stores, a bar, a posho mill), transport, livestock brokers; casual workers in other people's farms (spraying livestock, cooking, washing, fetching water); selling goods firewood, timber for construction (soap, sand, sugar and food) (Archambault et al 2013; Riमित 2014; this study various participants). A recent well-recognized form of income generating activity in MM is the ILEPA's supported beadwork business conducted by the women. The support from ILEPA includes taking the group for training in making the traditional Maasai bead ornaments and other garments as well as on how to run a beadwork business. During the focus group discussion with the members of the beadwork project, it was mentioned that the project has had immense significance to its members, as it serves as their only means of income. They said that the key benefit they gained from the business was some income, which had enabled them to buy their children school learning material. The beadwork project is a remarkable escape from the negative socio-economic impact. Nonetheless, despite its contribution, presently only a handful of women have the opportunity to be part of this crucial project, hence its impact is minimal. Last but not least, due to its proximity to MMNR, a few individuals have set up tourism camps that help generate some income.

Significantly more of these livelihood opportunities have favoured men. This is so due to the nature of the job and the fact that some jobs require some level of education attained. Herdsmen, security guards, tour guides, sub-chiefs and the like are typically male jobs. Education-wise, the majority of the general MM population comprises of people who have not attended school, and women are the bigger number, compared to men. As informed by Key informant 02, about 5 years ago, only less than about 15 girls and less than 50 boys had completed high school, and 6 people had gone to university. Presently, education is growing more popular: the number of children (age 6-14) enrolled in primary school is on estimate 60 %, although it shrinks to 25% for those enrolled in secondary (age 15-20). Even then, women are still disadvantaged on this front as there are still fewer female children attending school.

Summing up, this chapter has shown that MM community is under pressure from the CC impacts. The main local livelihood system is undoubtedly exposed and sensitive to the changes in climate experienced in the region. Community members are doing the best they can by adopting various forms of responses to deal with the effects of CC on their livelihoods, especially on the pastoral production. However, both the impacts from CC and the various responses adopted are compounded by livelihood changes brought about from the land tenure change whereby MM has recently transitioned from a collective group ranch to an individual private holdings. By far, for the majority of the population, this change further exacerbates vulnerability to CC and weaken some local people's adaptability in the region by disrupting access to critical resources. Before presenting these issues, the following chapter covers the case of privatization in MM and worrying issues surrounding the process.

5. Land privatization in Maji Moto

Prior to exploring the interaction between land privatization and the CC issues in MM, unwinding the complex web of land demarcation and on-going allocation processes is imperative. This chapter gives a comprehensive coverage of the fraudulent land privatization undertaken in MM. MM being one of the many pastoralist communities across Kenya undergoing this radical tenure transformation, an overview of the phenomenon in the country is crucial to put things into context.

5.1. Pastoral land privatization in Kenya

The on-going privatization of the previously communally owned pastoral lands in Kenya was initiated by government in the 1960s upon its establishment by the Land Adjudication Act that was aimed at formalizing land rights, leading to - already mentioned - creation of group ranches under the Land (Group Representative) Act of 1968 (Ng'ethe 1993; Kibugi 2002; Ntiati 2002; Mwangi 2006; 2007). Major development institutions, included the World Bank and the United States Agency for International Development (USAID), played an influential role in formulation of the policy that encouraged individual tenure rights (Fratkin 2001; 1997). From these institutions points of view, this policy informed by Hardin's *concept tragedy of the commons* (1968) was perceived as a way to achieve socio-economic development as well as reduce degradation in pastoral areas. Guiding the move were various conventional economic theories that claim that individual property rights are key to land development and economic growth. Firstly, private land rights would ensure tenure security, hence an incentive to invest, in that the owner(s) bears the costs and benefits accrued to utilizing the land and its resources (Cotula et al. 2004; BurnSilver & Mwangi 2007). Secondly, with a private land title as collateral, individuals can acquire credit from financial institutions that can be used to meet livelihood needs by for example improving the land productivity or starting a micro enterprise, etc. Thirdly, with the procession of individual rights to land, those incapable of developing their land could rent out to a person with necessary capital to invest it more, thereby benefiting from the arrangement (*Ibid*).

The knowledge that encouraged creation of private – collectively managed group ranches did not go unchallenged. It was feared that the privatization would reduce the livestock mobility, which is critical for the pastoralism in ASALs (Behnke et al. 1993; Scoones 1994; McCabe 2004). Hardin's thesis has been criticized by social scientists due to the assumption that there is no restriction on use in communally held resources (Fratkin 1997). Under the communal tenure system in dry areas, there exist regulations on access to users and sanctions for abusers, as well as mechanisms to conserve resources at certain times of the year to avert overgrazing. In fact, these mechanisms are more effective in comparison to exclusive and private forms of ownership (McCabe 1990; Behnke & Scoones 1992; Bromley 1992; Turner 1993; Peters 1994).

Despite criticism, 57 group ranches (GRs) were formed. The ranches 'promised benefits' motivated the pastoral community to agree with creation of GRs. They were to provide them with secure tenure through group titles, as well as help in improving the production of livestock by ensuring balanced grazing to reduce environmental degradation, and encouraging infrastructural development such as water sources and schools

(Boone et al. 2005; Ntiati 2002). To manage the ranches on behalf of their fellow community members, committees of local individuals were to be elected by registered members.

The group ranches failed in their objectives which onset subdivisions of the group ranches for several reasons. Firstly, the GRs committee members and individuals with political influence, seniority, business acumen, and some elites allocated themselves the best lands with secure title from the group ranches (Doherty 1987; Galaty 1992; Galaty & Muei 1998); and embezzled community revenues and development funds (Sundstrom et al. 2011). For these reasons, there was need to secure tenure which drove ranches' members to subdivide the ranches (Campbell 1993). Secondly, subdivision was also seen as a solution against inequality of group ranch system (Rutten 1992; Mwangi 2007) and a way for members to manage their own affairs (Doherty 1987). The government encouraged this through an active policy and a presidential decree that pushed for GRs subdivisions (Grandin 1986; Galaty 1992; Campbell 1993). The then president, Moi, argued it was a way for families to develop their pieces of land, and avoid possible future conflicts within group ranches. Thirdly, as indicated by Campbell et al. (2003), Kenya's political and wealthy elite interests in acquiring land and controlling wildlife-related and beef ranching income also encouraged subdivision.

5.2. Rough path to demarcation in Maji Moto

Having been declared a GR in 1978, MM was set for a different path of development under the new tenure policy. Like in the other ranches, a group representative, the committee (comprising 3-10 members), was to be elected to safeguard member's right and manage the group on behalf of the registered members as specified in the Land (Group representative) Act (Mwangi 2007; Riamit 2014). The act provides that an annual general meeting requiring all members to participate be held. Although the ranch committee has the power to run group affairs, including crafting the rules, for any decision to be made, a minimum of 60% of the members must be present, and same percentage of votes cast (*Ibid*). Interestingly, the final vote to subdivide did not meet this requirement. Before discussing the details of the actual demarcation process, it is imperative to understand why and how MM got to that stage.

The push and the decision to subdivide MM are largely blamed on a few individuals, mostly group ranch committee members, other than the group members' consensus (Sloman 2013). However, the 2013 data from a survey on the issue show that 60% of men and 70% of women supported privatization (*Ibid*). Several reasons contributed to the need to dismantle the MM group ranch model. The first and the most influential reason was to protect the local resources. Corruption, malpractices and irregularities in leadership by the committee in charge of management (Riamit 2014) made members insecure about the future of the local resources. Among the key problems included: unequal GR membership treatment by the first committee whereby in the group ranch register it included absentee members, denoted *acceptees*⁸ mostly people with whom they have close relation. Two, the mismanagement of communal funds, for instance the then annual 4

⁸ "The notion of 'acceptee' was originally understood to mean someone from another ethnic group who was 'accepted' by the Maasai community to become a member, with rights; this interpretation has in this context been expanded to include members of the Maasai community not resident in MM GR but granted the same rights." (cf. Riamit 2014: 47)

million Kenya Shillings (KSh) the community received as compensation fee for wildlife hosting within the GR. It was alleged that money only benefited a small number of individuals. Lastly, and perhaps the most important issue, was the exclusion of the ranch members in major decision-making. In one of the cases, through interviews by Riamit, the group ranch members could not hide their discontent for not being involved in a lease contract agreement (for tourist related activities) between the GR representative and a private developer, which saw a communally unwarranted contract extension for 25 years. Essentially, the illegitimate seizure of land by elites, also witnessed in adjoining GRs contributed to the need to subdivide (Sloman 2013). Furthermore, as a reaction against the mounting number of immigrant ‘outsiders’ to MM, subdivision was seen as a way to prevent losing the local resources to the visitors. On a different note, there was an impression in MM that privatization opened up land for individual projects such as cultivation seen in other ranches. Nonetheless, many faulted those who pointed to the idea of cultivation indicating that MM has different and harsher ecological conditions for such practice than elsewhere. Lastly, value of individual ownership, simply the need for own possession, not collective: to be able to say “this is mine, not ours” (*Ibid*), also contributed to the push for privatization.

The MM GR different committees’ poor performance during the long and contested process to privatization, as presented below, only gave the ranch members more reason to subdivide. It took in total 14 years (1999-2014), for the GR demarcation to start in MM. Mr. Riamit, local activist and director of ILEPA and a MM GR member, terms the process leading to eventual privatization as a “long and treacherous (if not torturous) journey” (*Ibid*: 45). The corruption, malpractices and irregularities in leadership by the various committees during management extended to the subsequent committees that were given the demarcation mandate; problems that partially contributed to the drag. “The controversies over land subdivision of the (MM) GR broadly related to the concerns over the process itself, members’ access to timely and accurate information from GR records, participation in decision-making, management and distribution of group resources and the integrity of the GR records” (*Ibid*: 53).

The table 3 below presents a summary of two key issues as discussed by Riamit (*Ibid*) that posed challenges toward equitable land privatization in MM and which largely contributed to a long and contested path to subdivision. Included are the causes and the feared outcomes if the issues were overlooked.

Issue	Cause(s)	Outcome-some example(s)
Low access to critical GR information such as members register	<ul style="list-style-type: none"> - Physical inaccessibility - (Low) literacy level among members - (High) cost of keeping records - Ignorance of GR functioning 	-Manipulation of GR members register (double entry, omission of membership)
Low participation of members in GR Annual General meeting	<ul style="list-style-type: none"> - Deliberate omission of the meetings - Low awareness of GR functioning 	-Poor governance - negative impact on GR objectives – including privatization (manipulation of register, equality and fairness in privatization-quality and quantity wise)

Table 3: Maji Moto Group ranch privatization challenges, causes, & possible outcome

The efforts to ensure these key issues were taken into account in the privatization process saw various committees come and go. ILEPA, the NGO comprising a group of local activists worked with the

community to put pressure on the committees on this front. According to the key informant 04 (one of the activist), there were at least 5 fundamental issues that needed to be addressed before demarcation. One, *equity of parcels allocated*: given the topography of the region: hills, plains, scarce and spread-out key resources such as water, salt licks, vegetation cover – pasture, rocks, trees and the like, the qualitative equality of parcels allocated was to be considered as a critical aspect in privatization. Two, *equity of common utility*: relating to the equality of the parcel allocated, equality in access to various common utilities such as shopping centres, schools, health centres, churches was also to be considered. Three, *accountability for communal financial resources*: having leased out part of communal land for conservancy (*oraro camp*) and for mobile network masts (safaricom and telcom), there was a need for a mechanism to ensure transparency and equal benefits for all members from these ventures. From *oraro camp* lease, the community has to receive Ksh.2 million (USD22,624) annually, which is unaccounted for. Four, *settlement of boundary issues*: there existed dispute over boundary between MM and *Eldonyo Rashan*, a neighbouring GR. It was imperative that such cases be resolved before subdivision occurred. Five, *addressing the discrepancy in membership registration*: as lightly indicated earlier, various committee had manipulated the GR membership register. There were multiple registrations, some deserving and underserving people omitted and included respectively in the register. This was yet another critical matter that needed review. Sadly, in spite of long term ILEPA and community lobbying through court cases, the last committee trickery and pressure to privatize, and the ranch members' frustration with various committees gave way to MM group ranch being subdivided, the contentious issues still unresolved. The statements below from Key informants 04 & 02 provide a snapshot of what pushed the process overboard:

“The political leadership (committee) and some elites wanted the land privatized so as not to get their own share but also possibly get a chance to grab part of the land and critical land resources such as water, salt licks. The rich elite saw the process as a road to do heavy investment, protect their land and their resource wealth. For the regular community members, privatization was a way to safeguard their land against the committee they had lost trust with, among other reason: run own affairs, for instance sell parcel, develop. GR members just wanted their individual land as they were tired of the committee and their corrupt nature.”

5.3. Fraudulent demarcation & parcel allocation

As quickly hinted earlier, MM committee failed to observe the Land (Group Representative Act) that requires 60% of members vote and presence during the eventual decision to subdivide. Only about 100 of the estimated 2200 group members were present during the meeting that led to legitimization of demarcation, despite a lack of expected representation, or resolution for the aforementioned contentious issues. The ranch members as informed earlier were tired of frustration by the various committees. Most members, quoting key informant 01 (a local youth development activist), “just wanted a parcel regardless of its qualitative nature”. As such, the final decision to go on with the subdivision did not involve the community. The agreement and the message from the committee was pay for the title and get land. They (the committee) “issued a bank

account number and asked members to deposit money, after which their title will be issued” (key informant 04).

As indicated by Riamit, adjudication officers together with the District Commissioner of the district appoint a demarcation committee encompassing 10-15 persons within an adjudication section (GR) who join the rest of committee members. Their role is to guide the surveyor in ensuring minimal disruption of existing settlement arrangements among members, preventing conflicts and securing common utilities. The law (Land (Group Representative Act) does not provide guidelines on how the actual demarcation is to be done: “how to allocate, what, to whom, where and how much”, hence the procedure is to be decided internally (Mwangi 2007: 821). Nonetheless, the Act does provide that all members have equal and undivided share of the GR (*Ibid*). A study by Mwangi (*Ibid* from four similar cases from Kajiado district (now a County), shows the agreed subdivision procedure put significant effort to ensure equality in the parcels allocated. A consensus between the ranch members and the committee was met where it was agreed that: the subdivision procedure should ensure all the parcels created were relatively equal in size, the only exceptions was where land was in a distinctly marginal areas, for instance hills, near streambeds. Interestingly, exceptionally larger families were to receive larger parcels.

In MM, there was no consensus between the GR members and the committee. The latter took the liberty to decide on demarcation procedure. The ranch demarcation was done on paper, adopting a grid system, also seen elsewhere – Elangata Wuas (Wangu 2013) (see the demarcation map, *appendix 2*). This process shows no sensitivity to qualitatively uneven topography – hilly, plains, widespread scarce land and social resources across the landscape. See the figure 5: areas circled in red show the concentration of the limited, shared social resources (schools, health centres, shopping centre and permanent water points) across the landscape, within and outside MM. A total of approximately 2200 parcels, each 48 acres, were created, equivalent to the total number of registered members. To the present day, majority of the GR members have not seen the demarcation map, and no information from the committee members has been provided regarding common utilities such as water sources, land for town centre, schools, hospital/clinic, churches etc. As expressed by key informant (02) “the reality is that much of the information regarding privatization and allocation processes is not available to majority of the GR members. The committee has not been transparent, a clear indication of their intention to manipulate the outcome” (Key informant 02). Key informant 02 noted that, “only a few privileged members have had access to the privatization map and the membership list”.

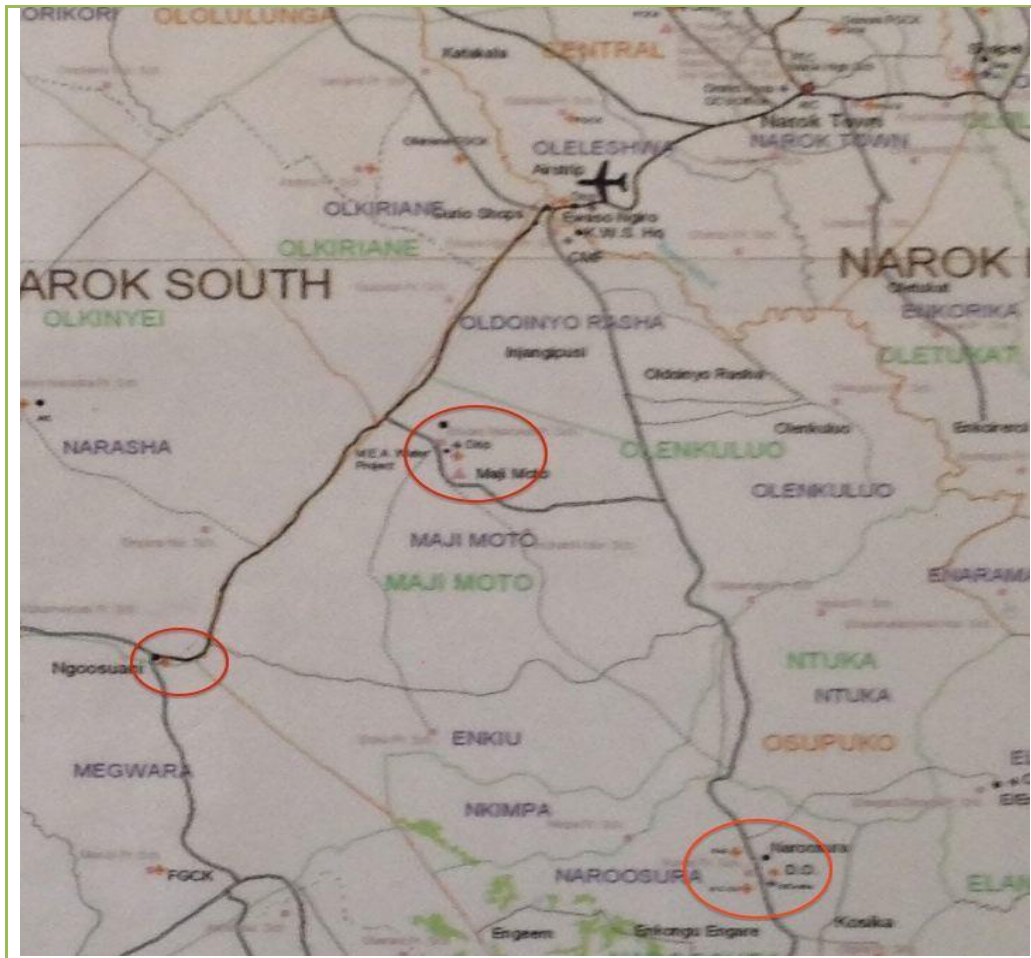


Figure 5: Social utilities concentration in Maji Moto (map from NDMA Narok office)

Various serious cases have been brought up that highlight manipulation of the process by the ranch committee. One such is that there have been claims that, some members had not been registered in the final membership list, particularly people with no known inheritor, thus they have nobody to claim their land. “The unregistered members who go complaining to the committee are told that the time to make any claim on land has passed” (key informant 01). Also, the process involved some favouritism. Some few privileged (mostly committee members and their relatives and friends, and some influential elite) have been allocated parcels based on the quality of land, close to watering points and town centres where most social utilities – schools, shops are found. Riamit (2014) has hinted on cases where the committee asked members for money promising them a parcel site of their choosing.

Following demarcation, the process of accessing the parcels title deed as well as identifying the location of the parcels within the landscape has been a long struggle for many. Key informants 02 & 03 notify that out of the estimated 2200 parcels, only less than 500 title deeds have been issued since 2012. There are those who have paid for the parcels title deeds but their titles have not been issued or shown where their land is located. These challenges are attributed to the following various issues outlined below (as presented by Key informants 02, 03 & 04).

One, *lack of finance to pay title and survey fee, KSh.12,500 and 7,500 (142 and 85 USD) respectively*. The majority of the group ranch members are not able to produce these sums. Two, *lacking in favours from the committee or ability to influence them*. The poor with little favour or influence may have paid the fees but are unable to intimidate the committee in to handing them their title and showing them the parcel location. 90% of rich and elite, who want their parcels and titles, have them. Three, *creating a room for parcel manipulation by the committee*. A major related issue is the on-going damaging large-scale sale of land. It has been discovered that the committee has not only sanctioned some dubious land sale deals, but have also caused marginalization of some members swapping their strategic parcels for isolated ones to favour the buyers and make commissions off the transaction.

Concluding, land privatization is a critical shift in terms of natural resource access from the previously collectively utilized marginal lands, hence as pointed out earlier has opportunities for community members to address CC impacts but also exacerbate the problem of CC impacts and adaptive capacity to deal with the impacts. In the following two chapters, the opportunities from the new tenure regime, and the negative implications for addressing CC impacts are presented.

6. Opportunities of the tenure reform

This chapter presents various opportunities that the privatization of MM collective presents to the local individuals and/households, in terms of contribution to the livelihood endeavours and consequently adapt to the impact of the changing climate. The tenure reform as specified here broadens livelihood options for the locals: ability to diversify economic activities, and specifically giving the women a chance to land rights that opens some prospects.

6.1. Livelihood diversification

On top of the tenure security, a vital strong basis for livelihoods, the subdivision of MM GR has more to offer to the local residents by widening the livelihood diversifications options in several ways, and hence broaden adaptive capacity to CC. Firstly, benefits from relatively 'equal' utilization of the natural resources among the community members. In MM, and other pastoral communities under customary tenure system, resources particularly pasture, are commonly utilized irrespective of the number of livestock owned. The rich community members, who have large herds while the poor often own few livestock or at times none, enjoy relatively more economic gains from these resources. However, following privatization, the poor have an opportunity to either rent or sell pasture within their parcels to the rich individuals with large herds. Many in MM are happy about this development "economic balance" between the rich and the poor as termed by an adult/male respondent (01).

Besides pasture resource, MM is blessed with a variety of natural resources from which individualized tenure opens up for economic exploitation. They include: sand, building stones and trees. Interestingly, some individuals, upon receiving their parcels are considering to plant trees (Sloman 2013). Based on the availability of these natural resources, selling of the harvested sand, building stones and trees in the form of timber or charcoals are among the alternative livelihood foreseen by MM residents following privatization (*Ibid*). The opportunity to cultivate is also in the category of the natural resources as it depends on the availability of land qualities – good soils and water that support crop growing. MM residents believe that, as expressed by an adult male respondent (10): "settling in the private parcel presents a better opportunity to practice agriculture unlike in the traditional mobile lifestyle when community moves all the time". In principle, all these natural resources in MM are unevenly distributed across the landscape thus will only be found in selective parcels, including cultivation land qualities: favourable soil quality that support agriculture, and proximity to water sources. As such, as discussed in the following chapter (on the negative implications of the tenure reform), the corrupt execution of the privatization process has marginalized a significant number of the ranch members tapping the benefiting of these opportunities. Crucial to note is the fact that in this study, it was identified that the thoughts about adopting these natural resource related alternative livelihoods to earn a living under the new tenure are mostly popular among the educated, most of who are the youth and some adults. The old population still perceived livestock keeping as the only livelihood strategy.

Secondly, another form of livelihood diversification strategy involves using the individual parcels as collateral to access loans from the financial institutions, or selling part or the entire parcel, and investing the money. Taking a loan and using the money as capital for different investments was among the reasons behind the push for tenure transition among Kenya's pastoralist communities (see Cotula et al. 2004; BurnSilver & Mwangi 2007). Due to lack of banking infrastructure in the community and lack of such loan related knowledge in MM, it is not strange that none of the local study participants mentioned the idea as a path to expand livelihood options. It is also in question whether the bank would be willing to invest in the locals' lands given the harsh climatic conditions, especially on remarkably marginal lands in MM. Selling land, as presented in the following chapter has become an extremely unpopular development in MM.

Fourthly, as a result of privatization, there is an opportunity to change to a 'modernized' lifestyle in some traditional aspect of life Maasai life: smaller family size and intensified livestock production in the limited 48 acres. Traditionally, Maasai families practice polygamy (Nasieku 2004), and have large numbers of children that are seen as wealth (key informant 03). Under privatized tenure, MM residents, mostly young people feel that people should reduce the size of families – marrying only one wife and having fewer children, and maximizing the gains from the reduced number of livestock, as a new approach to life. Cases of livestock production intensification are already occurring in other Maasai communities (Kajiado), where people are practicing cattle crossbreeding resulting in greater market value (Galvin 2009). Among the returns expected from the livestock include: sale of the offspring, milk (already being done by women living close to shopping centres) and other livestock products (Sloman 2013).

Fifthly, increased participation in the tourism related business, by emulating the private developers engaged in conservancies (in addition to running tourism camps) has also been brought up by MM residents as a livelihood option (Sloman 2013). Conservancies have been identified as significant contributors to livelihoods bordering the wildlife protected areas such as in Laikipia (Homewood 2009). Various forms of private conservancy initiatives have been growing in the past 15 years next to Maasai Mara National Reserve (MMNR), and on estimate 40% of the region's wildlife spends there (*Ibid*). Furthermore, MM lands, together with other GRs' next to the MMNR, have been the central areas of dispersal since the reserve is not adequate to support all the wildlife in the surrounding area (*Sinclair & Norton-Griffiths 1979; Dublin 1986; McNaughton & Georgiadis 1986*). With the group ranch privatized, establishing conservancies become an attractive area of investment to continue presence of the wildlife in the region. This, however, is an expensive undertaking that most of the poor community members cannot be able to run, perhaps unless private investors were to be involved. However, the varying interest and the treatment of the individual parcels by different community members for instance those fencing as will be seen the following chapter significantly undermine the wildlife industry and related ventures, including conservancies.

6.2. New economic prospects for women from privatization

The privatization of MM collective broadens women economic prospects, thus improves their adaptive capacity. As informed by (Coast 2002), compared to men, Maasai women have fewer diversified income sources. In MM as indicated during focus group discussion with women, among the key activities they have engaged in include beadwork (some), collecting and selling firewood and together with men, livestock production. Their limited economic involvement is mainly attributed to the fact that, as indicated by Hodgson (1999), traditionally, Maasai women barely have any economic rights and control over pastoralist resources, which in turn limits their economic opportunities. Under customary tenure MM and other pastoral communities run a *patriarchal system*⁹, hence women have no rights to property. In addition, drawing from Archambault's (2013: 9) study in Elangata Wuas, "land politics are often categorized as 'men issues'". This is also true for Maji Moto. An experience during this study's fieldwork is a confirmation whereby in a critical community meeting on the on-going land sales issue, no woman was present. Besides being absent, they did not know what the meeting was about (Key informant 03). Additional evidence that women rights to property are not recognized in MM came to light when participants of this study were asked whether women should have rights to own land and/or make decision on how land is used. All male respondents, and some female, answered that women cannot own land, claiming that it was against Maasai culture. A similar answer was given for land decision-making process, where majority, mostly men said the 'men' (husbands in married families) should make the final decision on everything about land. Interestingly, some women in MM strongly feel they deserve to own land more than men given the domestic burden. Expressing why, an elderly/female respondent (16) stated that: "some men are doing nothing to support their family, leaving women with all the responsibilities, and hence land rights would help women in case of such a challenge".

Following the tenure transformation reform, the women's situation tenure/property rights under customary - patriarchal system are also bound to change. According to the Kenya's *Matrimonial Property Act* (2013: 1415), in marriage situations, the allocated private land is a 'matrimonial home': "any property that is owned or leased by one or both spouses and occupied or utilized by the spouses as their family home, and includes any other attached property". The Act specifies that a matrimonial property does not include those under customary law. The recognition of women entitlement to land as stipulated in the *Matrimonial Property Act* is fundamental change from the tenure reform, which broadens women economic opportunities by granting them with economic freedom of use of land, and possibility of making decision on how the land is utilized.

Land rights also ensure tenure - livelihood security for women and children, in event of an irresponsible husband as pointed out earlier, and particularly in extreme cases as witnessed through 'wasteful' sale of privatized land by husband (issue covered in the next chapter) where in some cases women and children end up losing the only livelihood asset they have (land)¹⁰. To safeguard the women and children's livelihoods', it

⁹ Patriarchal system – a system where the father or eldest male is head of the family and descent is reckoned through the male line

¹⁰ Corruption in land sale business - In instances where wife/wives would not agree to the sale of land (which is in nearly every case), husbands have used trickery, for example secreting taking their partners ID as a proof of their approval. The group ranch committee that is fully involved in the land deals has been complicit with such deceitful acts. (Information from key informants and some interview respondents, also brought up in focus group discussions)

is imperative to ensure the consent of the women is acquired before any land deals go through. This element is only present if women rights to land are legally recognized.

As Archambault (2013: 2) points out “the voices and opinions of women are remarkably absent” in the debates surrounding the pastoral tenure transition. In MM, like their male counterparts, women reprovved the on-going problem of land sale. Besides protecting the women’s livelihoods, the acknowledgement of women’s rights to land in MM is a chance towards a gradual shift to a society that welcomes female participation in the issue of land. Pastoral women play a major role in social and economic life, hence rights to land and recognition of the contribution they could make towards the on-going land issues is a plus to themselves and the community at large. Besides, “bringing in a female perspective to issues of land tenure transformation that is critically situated within the marital, familial, and community contexts that shape women’s lives, deepens our understanding of the role of tenure change in processes of development and social transformation, and provides critical insights into how best to approach land tenure reform as a means to achieve socially equitable development outcomes” Archambault (*Ibid*).

Elsewhere, the mobile nature of the traditional Maasai societies, as well as their exclusive duty to build new houses, constrains their ability to participate in elaborate economic activities. Settling down provides MM women with more space to engage in various new economic undertakings, compared to being in a mobile setting (Sikana & Kerven 1991). Recent studies show that sedentarization among pastoral communities, in Kenya and Ethiopia, has provided women with economic opportunities outside livestock production - cultivation related, selling milk and providing labour (Fratkin & Smith 1995; Nduma et al. 2001; Little et al. 2001).

Essentially, the benefits from the new tenure in MM revolves around private exploitation of natural resources for the general population, and increased economic freedom among the women ensuring acknowledgement of their rights to property. However, as hinted in this chapter, most of these benefits, especially regarding exploitation of the MM wealth of natural resources are skewed towards selective individuals due to the corrupt nature and flawed demarcation and allocation process as presented in the following chapter.

7. Negative impacts of the tenure reform in Maji Moto

In this chapter, the impacts of the tenure change from communal to individual free holdings in MM are presented and points towards far reaching consequences including: endangered pastoralism whereby privatization initiates increased struggle to access limited water and pasture resources for different households or even complete different forms of socio-economic and ecological marginalization & vices, and the problem of escalating sale of privatized land. These negative implications either enhance the impacts of climate change, for instance by increasing the struggle to access water and pasture, or weaken local adaptive capacity by denying some members a opportunity for an alternative livelihood. Much of the complication emanates from the fraudulent demarcation and allocation of individual parcels.

Stressed earlier, is the fact that pastoralism is the backbone of livelihood in MM and holds key responses to the impacts of CC on scarce, highly dependent on water and pasture, resources. However, the privatization of MM collective is having precarious implications on the practice. MM residents are crying that privatization is the end of pastoralism in the region. Expressing his feeling on the tenure change and pastoralism during an interview, an elderly/male respondent (21) said that privatization “is the worst thing that has happened to this community.” An elderly/female respondent (29) feels that the new tenure “is the end of livestock, hence end of the community”. As uncovered in this study, the individuation of the MM collective seems to be edging towards undoing pastoralism. Privatization has implications on previously outlined key pastoralist features: mobility and social capital essential to accessing the scarce natural resources. Furthermore, the corrupted demarcation and parcel allocation process has not helped, whilst the increasing ‘worrying’ land sales deals have further escalated the situation.

Maji Moto inhabitants’ ability to maintain, sustain, earn a living and thereby adapt to the impact of climate change goes beyond pastoralism. Other socio-economic and ecological consequences from land privatization and marginalization in the MM have significant negative implications on the community members’ livelihoods. The areas involved include: access to other resources besides water and pasture and the social utilities, housing, conflicts and wildlife industry.

7.1. End of mobility

As previously indicated, the contestation by scholars against pastoral land privatization revolved around reduction of livestock mobility essential for pastoralism. Livestock mobility, which is only possible under collective tenure, is identified as a crucial strategy to respond to pastoral ecological variability and risk (such as in MM) (Behnke & Scoones 1992; Sandford 1983; Niamir-Fuller 1999; Mehta et al 1999). MM is coming in to terms with the mobility predicament following the GR subdivision. End of mobility for a change is alien to MM community members in the region and for which they lament. During this study, a looming problem of accessing adequate pasture, for the livestock especially given the impacts of CC, was the most complained about outcome of the tenure change. Expressing dissatisfaction on the new tenure arrangement, an adult/female respondent (03) maintained that ‘open’ access is an important practice in our dry environment but following privatization, there will be nowhere to graze once the available limited pasture (if

at all there is any¹¹) in the allocated 48 acres is exhausted”. MM residents are stressed that mobility, which has been part of the community life and a resourceful tool to acquire pasture during dry periods, is no longer an option at least in the long run when the subdivision process is concluded. As mentioned by most study participants, people will have to stick to their own parcels and depend on the available forage therein. Many in MM believe that individual parcels owners will not allow others to gain access to any resources once the process is completed.

A key element of the new private tenure system, and which many in MM expect, is restriction within individual parcels. The individual owners of the parcels are, therefore, limited to keep the number of livestock that can be accommodated by the forage available in the 48 acre piece of land. This brings the question of the carrying capacity of the 48 acres in MM. Carrying capacity has only been done on rangelands level hence the definition by FAO (1988): the maximum stocking of herbivores that can be supported sustainably within a rangeland. It has also been emphasized that the estimation of a rangeland carrying capacity should adjust for multipliers that maintains forage supply and demand balance: grazing efficiency, forage loss e.g. due to trampling, and proper use – avoiding degradation (Leeuw & Tothill 1990). As previously indicated, mobility is the tool responsible for this balance. Elsewhere, as argued by Roe (1996: 467), “even under environmental conditions of great certainty, the notion of carrying capacity would still be ambiguous and confused.” As such, in dry areas where the uncertainty is high, it is very difficult to ascertain the carrying capacity (*Ibid*). Here, the study relies on local knowledge on herd management. MM residents believe that barely 10 cattle can be accommodated in the 48 acres parcel amid the CC impact on the annual rain. This number obviously does not adjust for the disrupted forage supply-demand multipliers since privatization ends livestock mobility across MM rangeland. Reduced livestock mobility leads to overgrazing (Mwangi 2001). A significant decline in the number of livestock kept is alarming everyone in MM. As indicated earlier, keeping big herds of above 50 cattle is the norm in the community, which is not only necessary, as livestock are the only means of livelihood for commonly large Maasai families, but also because the large number acts as insurance to climate variability and risk associated. It has also been pointed out that, historically, herd size below 10-15 cattle leaves households at poverty trap, leaving them exceedingly sensitive to drought frequency (Barrett & Santos 2014). It’s not guaranteed that the parcels’ size will remain 48 acres, as there is a possibility of household members demanding to fragment the parcel further (see the case of Elangata Wuas, Wangu 2014). This will intensify the problem of access to within the parcel resources, and degradation.

I had been warned that sedentarization has adverse impacts on ASALs ecosystem (Niamir-Fuller 1998). The developing sedentarization is present proof of the future of restricted mobility in MM, and consequently to pasture resources. Most of the 500 people who know their parcel location and possess the title deeds to the land have already moved to the location and built a private home, others are in the process of establishing home structures ready to move. As informed by the study participant and witnessed during field data collection, able persons, mostly the rich, including the group ranch committee members and some local elite,

¹¹ Some individual parcels are located in areas that cannot grow grass as will be discussed in a later section of this chapter.

have put fences around their private parcels (*figure 6*). On one occasion during the fieldwork, an interview with a herder had to be put on hold so that the interviewee would prevent the goats and sheep from entering an unauthorized barbed wire fenced parcel. Although the majority of MM residents feel that individual parcels owners should refrain from fencing their parcels but instead continue with traditional open access in spite of private land ownership, many maintained the fence advancement across MM landscape was unfortunately inevitable due to those who had already fenced. This is so because, as emphasized by the study key informants: those members who have fenced their parcels are taking advantage of others who have not. A case of one of the committee member who had fenced was used as one of many examples to show how the situation is developing:

With his parcel fenced, he has had a tendency of sending his livestock to other community members' unfenced parcels during the rain periods, only to bring them back to his untouched parcels in dry periods when nobody has access. Such rising incidences will put pressure on every individual in MM to erect fences in their land.



Figure 6: Image of fenced parcel in Maji Moto (picture by Wangu 2014)

Confinement to individual parcel and on-going fencing present a huge challenge to water accessibility. As highlighted earlier, traditionally, to ensure availability of water during dry periods the pastoral communities camp around the limited watering points. By being restrained within the newly allocated parcels, some MM members will have a tough time reaching the few watering points. With only two permanent natural springs, individuals allocated to parcels that are situated at far distances from these sources will have to “walk all day” to get water both for livestock and domestic use (elderly/female respondent (30), male youth and women focus group discussions). Furthermore, the on-going fencing deepens this problem. As indicated in a focus group discussion with the male youth, with the fences in place, there will be no trespassing to shorten the distance across the vast landscape to the watering points for the people whose parcels are located further in the interior. This doubles or even triples the distance covered than otherwise. Certainly the most disturbing subdivision outcome regarding the issue of water in MM is privatization of some small wells, previously accessible to general public. One of the cases most complained about, as informed by key informant 04, involves a shallow well located at Loita plains next to Maji Moto-Maasai Mara road. The owner of parcel where the well is located has put fence around the land. Key informant 04 believes while people might not be denied access to these privatized water sources during in the present time, in a near future when the

privatization process is completed and the water situation gets more desperate partly due climate change, the situation will reverse.

Lastly, as emphasized, mobility has significant contribution to social capital by ensuring establishment of distant social relations that promote coordination and cooperation around scarce water and pasture resources across the vast landscape. Curtailed mobility will bring an end to this fundamental social capital which is the basis of what Boone et al. (2005) call reciprocity culture that fosters access to water and pasture resources among the Maasai. Furthermore, many in MM fear that individualism creeping as a result of sedentarization; local cooperation and coordination among the local people will be subdued. In fact, a few interviewees in this study indicated that since privatization commenced, some community members had grown selfish i.e. less willing to help others in times of need. There was a general feeling as expressed by a female/elderly respondent (29) that old people, often unable to take care of themselves would suffer the most once people start to live individually. In communal society such as MM, old (and very poor) communities commonly depend on the social support from the society.

In sum, as scholars had warned prior, besides reducing access to and (the possibility of) causing degradation of natural resources, the privatization (of MM collective) has resulted in loss of collaborative management practices which are key to livestock production and drought resiliency (Seno & Shaw 2002; Western & Manzollillo-Nightingale 2004; Curtin & Western 2008; Western et al. 2009).

7.2. Marginalization

Scholars had warned that some members of pastoralist communities could experience socio-economic and ecological marginalization due to subdivision and subsequent sedentarization (see Boone et al. 2005; Campbell et al. 2000; Galaty & Mueni 1998; Seno and Shaw 2002; Western and Manzollillo-Nightingale 2004; Western et al. 2009). The fraudulent demarcation and parcel issuing in MM has deepened the problem of marginalization of vulnerable community members. By adopting a grid system to create the individual parcels, the subdivision has led to extensive socio-economic and ecological marginalization in MM. Drawing from a related study (Wangu 2013) that explored equality of land/land resources distribution in a different subdivided GR - Elangata Wuas, with similar setting as MM, the grid system caused significant land/land resources fragmentation. The system as a demarcation method in semi arid regions introduces numerous levels of land/land resource related inequality that pushes some selective community members into deep poverty. As indicated in the Elangata Wuas GR study, the parcels created using the grid system can be categorized either as 'good' or 'bad' depending on the socio-economic and ecological traits therein. The table 4 below present a summary of the different land qualities based on Elangata Wuas community that determines whether a parcel should be categorized as 'good' or 'bad'.

Good parcel qualities	Bad parcel qualities
<ul style="list-style-type: none"> • Close to social amenities – schools, hospital, roads, watering points • ‘Good’ topography - flat • ‘Good’ soil quality – water retaining – black cotton soil • Rich in vegetation – trees for shadow & house construction, sufficient grass • ‘Good’ type of grass – nutritious and dry weather enduring • Minerals – sand and building stones • Moderate temperature and population density • Sense of belonging and social network 	<ul style="list-style-type: none"> • Away from social amenities –schools, hospital, roads, watering points • ‘Bad’ topography - hilly and cliffs • Non-water retaining (sand soil). • Less vegetation • Rocky & • Wildlife – predators invaded

Table 4: Summary of 'good' and 'bad' parcel qualities in Elangata Wuas (adapted from Wangu 2013)

The quality and/value of any land is determined by its social, economic and ecological characteristics. The last two features have a causal relationship and define the productivity of the land. A number of factors outlined by FAO (1995) are relevant to establish the productivity of land in MM: land cover qualities e.g. number of trees, and surface and terrain qualities – stoniness and soil qualities – water retaining moisture storage. Social qualities of land are equally as important as the economic-ecological elements of land, particularly accessibility to social amenities – watering points, shopping and health care centres, schools, churches and the like (see *figure 5* on concentration of social utilities in MM), as well as non-materialistic value of land – social-cultural values attached to land. For the non-materialistic element, as indicated by Grandin (1991), prior subdivision, the socio-spatial organization and land use among the Maasai communities defines existing cross-linking relationship both group-wide and individual. The grid system demarcation in MM and elsewhere, as highlighted creates two categories of parcels – ‘good’ and ‘bad’, as shown in table 4 above, based on social-economic and ecological setting – mainly proximity to social amenities; soil, land cover and atmospheric qualities.

Water and pasture marginalization

Merely due to privatization, pastoralism is significantly threatened. The inequity in the demarcation and allocation process where some individual get allocated the ‘good’ parcels and others the ‘bad’ ones in terms of accessibility to limited water and pasture resources leads to unfair vulnerability for some members. The individuals who get allocated the parcels away from watering points and/or those with less or no pasture at all, only covered with rocks as witnessed during this study (*figure 7*), will have a significantly greater challenge meeting livelihood needs compared to their counterparts who receive favourable options. In an interview, an elderly/male respondent (02) lamented about the issue, saying: “pasture cannot grow in some areas in MM landscape, meaning those allocated parcels in such places will be unable to keep any livestock”. Far worse, there is a possibility of owning a parcel in a place where there is no pasture and watering point at a distant location. Generally, as learnt during this study, in terms of water and pasture resources, parcels can be put into two major categories: plains versus the ‘mountainous’ ones. Those in the former are regarded as being closer to a watering points, also expected to have an easier terrain but less in pasture availability. For the latter, the owners would have a bigger challenge accessing water as no watering points are located nearby, and the terrain are tough but are likely to contain relatively more pasture.

Further scrutiny on the allocation process revealed preferentialism during parcel assigning, instead of randomly distributing the parcels, which would mean each person has a chance of owning a ‘good’ parcel or ‘bad’ parcel. As previously noted, the committee manipulation of the process included favouring themselves and some selected members through better parcel allocation. Consequently “most of the good places i.e. parcels especially near the water sources, main roads, close to shopping centres are owned by committee members themselves, their relatives and friends, the rich or the land buyers” (key informant 02). The land buyers’ story is covered on the land sale distress section below.



Figure 7: Image of a rocky parcel in Maji Moto (picture by Wangu 2014)

Natural resource (besides water and pasture) marginalization

As identified in the previous chapter, there are more natural resources, other than water and pasture, in MM that could have significant contribution to socio-economic life of the community members. However, given that these resources: trees, sand, building stones, cultivation soil qualities, are exceedingly unevenly distributed across the landscape, following the demarcation approach and marginalization in the parcels allocation process conducted in MM, only selected community members are lucky to land some of these resources.

In addition to being a source of income upon sale (as mentioned in the previous chapter), trees are a crucial source of building material, fencing and fuel in form of firewood or even charcoal for households in MM. Housing materials and fuel, and fencing livestock sheds including individual parcels as of lately, are significant part of a living in MM, hence individuals who fail to secure these resources in their individual parcels will have to buy or likely borrow this resources. Buying will be an additional burden to livelihood pursuit, a situation MM residents are angry about. In an interview, an elderly female respondent (14) was furious saying: “even trees to fence and cook not found in vast part of MM landscape (plains) had been privatized and some people will have to buy or if lucky borrow from individual who get lucky” (figure 8). In MM, women, the caretakers of the household resources are to be the most affected by the problem of wood fuel, and they had foreseen the threat prior to subdivision as indicated by Sloman (2013).



Figure 8: Image of tree 'bare' Loita plains in Maji Moto (picture by Wangu 2014)

The chance of practicing cultivation as a means to livelihood in MM depends on being allocated a parcel with favourable qualities – particularly close to a watering point as considered by many in MM. Rainfall-cultivation is out of question, especially in the context of the changing climate, since with low rainfall, it is not possible to grow crops. Also, the quality of soil of the parcel including water retention, nutrients to name a few, as well as the ground cover – not rocky and flat topography should also be considered important for the activity. Again due to the method adopted and marginalization in the allocation process, and uneven land qualities across MM, only a selective number people have a chance to undertake the increasingly popular cultivation-based livelihood alternative. Similar fate of distribution to MM members extends to other valuable natural resources – sand, building stones, and others not mentioned in this study.

At this stage, it is crucial to highlight the influence the individualized tenure has on rules and norms regarding natural resource utilization, particularly trees in MM. Under customary tenure, trees are highly protected. Based on “Maasai culture, cutting a tree down from the trunk is strongly denounced, and punishable” (adult/male, respondent 25). There is noteworthy fear in MM that due to privatization, rules and norms on how trees are treated by community members will change as witnessed other privatized GRs, whereby slashing down of the trees to sell in form of timber or charcoal has become a common target for generating income under private tenure. In Elangata Wuas GR, charcoal burning has become a potential target for income generating activity (Archambault 2013). Even so, it is interesting to note that not every person (woman) in the region is able to do so as grass availability is a significant part charcoal preparation process, hence those without grass in their parcel are not able to exploit the charcoal economic option. Charcoal trade is illegal in Kenya, unless one has a license. In fact, due to increased incidences of illegal charcoal burning that has cost a large part of country’s forest cover; the government is reconsidering legalizing the trade in charcoal (Ndonga 2012). Illegally, most of the charcoal making way to the towns and cities like Nairobi in Kenya are coming from the recently privatized ASALs. A sack of charcoal costs on estimate KSh.2,000 (USD22) in Nairobi (Mwaniki, 2014). During this study, it was witnessed that charcoal sellers are smuggling charcoal to the city through the public transport, as the traffic police are unlikely to check or perhaps bribed. Notwithstanding the benefit accrued, charcoal burning in MM increases the future danger of desertification, and will in the present increase the problem of local access to wood fuel, building and fencing discussed above.

Social facilities marginalization

Barely any participant in this study brought up the issue of social utilities yet social services are a critical part of any community (see Wangu, 2013). Nonetheless, access to social amenities including schools, health care centres, and shopping centres is imperative for livelihood and socio-economic development, thus contribute to adaptive capacity for the local community members. Convenient access to social facilities, for instance by living in a location close to these utilities is not only crucial for instance during emergencies, specifically in health cases, but saves time and resources during the effort to acquire the services. In Kenya's pastoral regions, there are few and widespread social amenities due to the ASALs negligence by the local governments throughout the past (RoK 2012). As a strategy to ensure access, pointed out earlier, majority of the population in MM are living in close proximity to the social utilities: close to shopping centres where schools, health clinics are also located. The grid system subdivision approach in MM, present significant households' being marginalization from these social resources, especially people who will get allocated parcels in the isolated places where no social facilities are available (see 'bad' parcels in *table 4*). Those who get the marginalized parcels will not only have a difficult time reaching these services but in the process it will also costs both money and time, resources that could be spent on other livelihood and socio-economic undertakings.

Housing related marginalization

Establishment of a permanent housing following sedentarization, as covered in the previous chapter, is fundamental to earn a living for women in MM. Additionally, it is obvious that housing is a basic necessity and a basis for the households' efforts to pursue livelihoods. As such, it is therefore not surprising that MM residents are looking forward to establishing a permanent housing as the first thing upon receiving their individual parcels. Various land features in MM as presented in *table 4* including, rocky, cliffs, hilly grounds present some difficulties for setting up houses. Some individuals have been allocated parcels in places hence will face housing problem. An adult/male respondent (17) touching on the issue pointed out that "some parcels are covered in rocks, others are in elevated grounds - hilly places or cliffs ...one cannot put up a house in such places." This is another critical social-economic problem arising from the poor execution of demarcation in MM.

7.3. Conflicts

Conflict is detrimental to livelihoods (USAID 2005; UNDP 2013). While exploring the implications of GR privatization in MM, the term 'conflict' surfaced often as one of future ensuing consequence from the tenure transition. Many study participants expressed their concern that some of the injustices done by the GR committee during demarcation and allocation, for instance the different forms of favouritism will lead to violent tensions in the future and corrupt land deals (discussed in below). Various intimate exclusion such as the case of MM local members who did not get allocated, younger population as presented by Archambault (2014) are a potential source of conflicts. Family feuds over privatized parcels utilization e.g. between co-wives, parents and children experienced in Elangata Wuas (Wangu 2013) could also be experienced in MM in the future. It was also highlighted the presence of the resented land buyers who are mostly from other

tribes, particularly because of the individuals who feel the land buyers are encroaching on local resources. With land as the most critical resource in the region, and keeping in mind the recent history on land crisis following the strongly contested election in 2007-2008 (IRIN 2008), as pointed out by Key informant 03 “the changing land setting in MM could similarly turn into violence in the future”. The tipping point could be intensification of the scarce water and pasture resources due land fragmentation and the impact of the changing climate. As indicated by USAID (2013), competition over scarce water and pasture has been the cause of increased incidents of conflict in Africa. It is also believed that in the future, conflicts could arise in MM from other private tenure related issues such as trespassing and boundary disputes.

Presently in MM, much of the tension has been between the community members and the committee over land titles, or individuals complaining of exclusion. No case has been brought to court, perhaps because of the corrupt nature of the local justice system as pointed out by key informant 02.

7.4. Wildlife industry vulnerability

As seen earlier, wildlife industry contributes to livelihoods for some MM individuals who are involved in tourism related businesses, with room for expansion following privatization; conservancies. One of the key reasons identified is the MM’s proximity to the MMNR, which is adjacently located in the south. The second reason entails presence of wildlife use of the community land as their migratory corridors (Key informant 01). As indicated by Bhola et al (2012), the various gradual changes in East Africa pastoral regions including intensified land use and sedentarization, curtail the traditional seasonal movements of the wildlife between the protected areas and the community lands (*figure 9*). A key implication from the obstruction is a loss of wildlife populations in the affected region. A study conducted in eastern Kajaido, next to Amboseli ecosystem (one of Kenya’s National Parks) shows a sharp decline in wildlife following legal subdivision of the pastoral lands in the region (Western et al. 2009). This problem explains an appeal by scholars to wildlife management to secure the dispersal areas in order to maintain the movements (*Ibid*). The MM (and other GR’s) privatization and subsequent fencing is the exact opposite of such appeal, and therefore, the change in tenure will hurt the tourism industry, and in turn will hurt the related local livelihoods.

Majority in MM (and elsewhere), however, feel that absence of wildlife in the community is a positive thing as it reduce competition for water and pasture between the livestock and the wildlife to the benefit of the community members (Key informant 01; also see Campbell et al. 2000). Reduced, or non-existent of wild animals in MM, will also prevent cases of human-wildlife conflict that have created problem in the GR and other adjacent to MMNR (Walpole et al. 2003).



Figure 9: Image of zebra & cattle grazing in Maji Moto (picture by Wangu, 2014)

7.5. Land sales distress

The most alarming outcome of Kenya's pastoralist Maasai collective privatization is large-scale land sales. Studies indicate that the sale of individual parcels (partly or in full) has become a common practice and most of the buyers are non-Maasai (Galaty 1992; Galaty & Munei 1999; also see Viet 2011). This issue of land sales is as a result of the "race to secure and consecrate gain" from the formal titling as Mwangi (2004: 14) speculated. Sadly, ensuring tenure security has been the major conviction to privatize GRs, but ironically the individual land titles have seen many ignorantly lose it to the intruding buyers. As indicated by Galaty (1992), revenue from the land sold has been either wasted through consumer parches e.g. buying automobiles, leisure such as alcohol consumption, spending weeks at luxury hotels, or spent wisely by investing e.g. buying livestock, starting a business.

MM is no exception in this daunting problem of sale of land. Due to the secrecy and sensitivity of issue, reliable data on the people selling and those buyers is not available. Nonetheless, it is estimated that half of the individuals that have acquired their titles to their parcel (approximately 250) have sold, either in part or entirely, and the number grows by day (key informant 01). Also, as locally witnessed those who sell only a portion of their parcel, "after tasting the money" end up selling the entire land. Like in other regions, most of the buyers in MM, 90%, are non-Maasai – from other Kenyan tribes. Kikuyu was one of the tribes involved was mentioned during interviews. MM residents are aware of this land sale phenomenon and rebuke those involved, except if there is a convincing reason such as an emergency health care need. During an interview, a male/youth respondent (18) termed sale of land "a tragedy in the community". An elderly/male respondent (31) referred to the action as a death sentence because letting go of the land "leaves the owner with nowhere to live, with nothing". Many respondents in this study expressed their disappointment saying that those

selling land destroyed the future of their families (especially for their wife/wives and children in case of married). Parcel sellers (and their family) lose access to land/land resources. This in MM equals to poverty for the seller has no place to keep livestock, as pointed out by various study participants.

Desolately, besides owning some livestock or none (for vast majority), an agricultural plot or a form of *reliable* income generating activities (IGA) such as formal employment (for privileged few), the private parcel is the only livelihood asset in MM. Upon selling land, the victims put pressure both on their family and relatives who might have to provide support in the aftermath. Pointed out in this study, and as seen above, the land sellers have often wasted the money; buying cars, started businesses that have failed – a very interesting example, some have sold land entire, bought livestock with no land left to graze. The bad choices to sell land; including bad investment in the aftermath, are attributed to limited experience with the “penetrating money economy that is becoming part of the society”, and hence undeserved adverse consequences - loss of land and no money to show for it (an adult/male, respondent 27).

Feared ‘non-Maasai buyers’ social-cultural, economic & political influence

The rate and the nature of land sale in MM qualify to be part of land grab¹² debate. Most of the land buyers in MM are doing business at the expense of locals. The ‘throwaway price’ land has been sold at is inconceivable (key informant 02), especially to the initial buyers who bought an acre of land located at strategic places: MMNR-Narok road, at KSh.35,000 (USD398). Over time, a bit of familiarity with land market among the seller has led to steadily hike in price to KSh.80,000 (USD910). Adverts for land on sale in MM have been spotted in the newspapers as reported by key informant 01 and during this study on a new famous online platform in Kenya - OLX (2014). Given there is no reliable recorded data on the sales figures; this study relies on estimates based on the adverts to compare the land deals. The figure 10 below shows two advertisements: first one from the year 2013, and the second one from 2014. The first one suggests that the acquired land is being sold at KSh.10,0000 (USD1137)/acre. This represents a profit of KSh.65,000 (USD739) if the land was acquired from the initial sellers, and KSh.20,000 (USD398) if from the recent. In the second the advert, the profit is extremely high as each acre goes for 450,000 (5119).

¹² Land grabbing – also referred to ‘the global land rush’ is amongst most popular topic currently (see Zoomers 2010). The notion is generally linked to “familiar, iconic images from the past of (Northern) companies and governments enclosing commons (mainly land and water), dispossessing peasants and indigenous peoples, and ruining the environment (in the South)” (Boras & Franco 2012: 34). In Maji Moto, it is not *Northern* companies or governments rushing for the land, but within the countries entities.

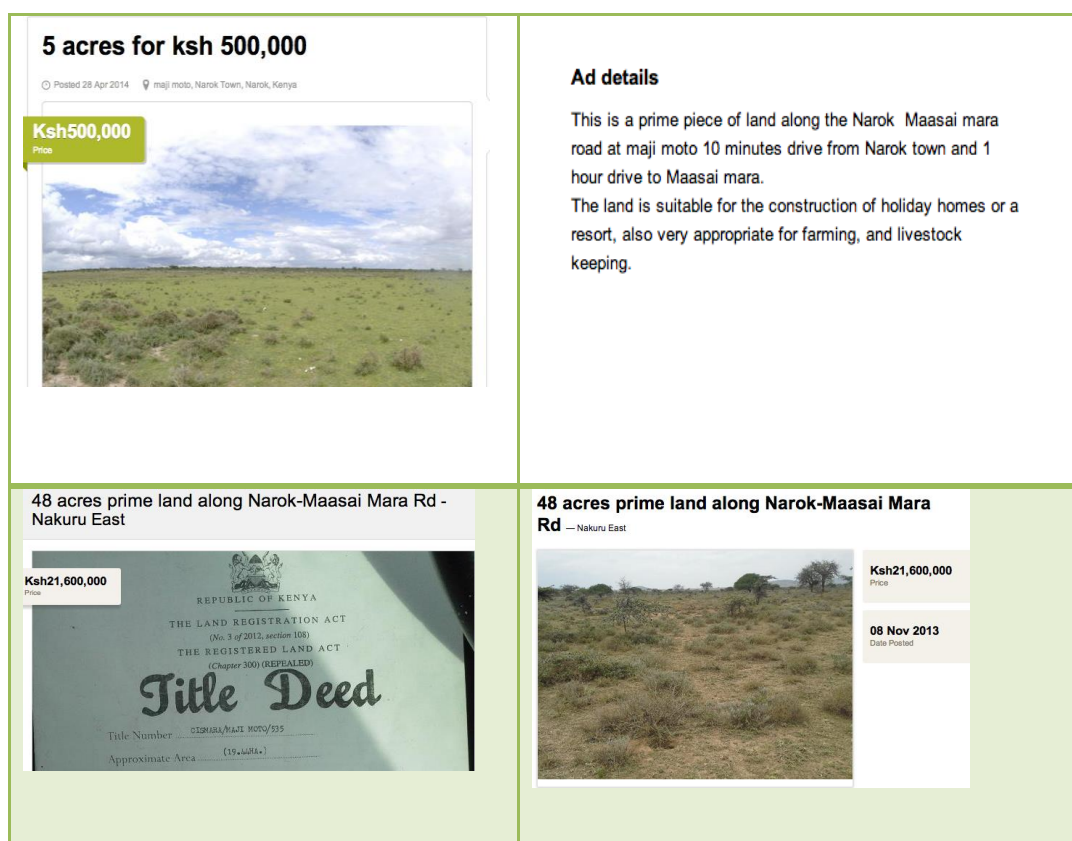


Figure 10: Maji Moto land sale adverts at (OLX 2014)

Interestingly, as indicated in the first ad, buyers have various interests such as “construction of holiday homes or a resort.” Key informant 01 indicated that, farming and tourism were among other activities on the agenda. Buyers interested in pastoralism, some rich buyers want to create ranches of about 200 acres for commercial livestock keeping as informed by key informant 02. All this is happening especially because land in MM is very cheap and ‘plenty’ currently. These ads as evidence to the trade in land occurring fits the notion of the infamous ‘land grabbing’, where few single individuals have been accumulating large tracks of land at cheap prices to enrich themselves. Although none of the non-local land buyers has moved to the community, most of them have put fences around their newly bought parcels.

Marginalization relating to land sales

All the land transfer deals in MM involve the participation of the GR committee members who have to sign off the transfer (key informant 02). Sometimes, the sellers do not necessarily receive the parcel titles first. This has created room for parcel manipulation in the favour of the buyers given that most of the ranch members have not seen the demarcation map, and do not know the initial parcel assigned to them. As would be expected, buyers in MM are interested in buying land located in strategic locations – mostly next/close to Maasai Mara - Narok road and MM centre. This interest, for which the buyers are willing to pay extra commission, has led to a critical problem of “parcel shifting” as termed by key informant 04. Unfairly, land buyers have been able to secure parcels in favourable places, mostly parcels close to the main road, schools, health centre, and water source, at the expense of community members. There is a heated debate in the community about how the community members are exchanging members’ parcels located at strategic places for those at marginal areas at commissions to meet the buyers’ interest. Plainly, as put by key informant 02,

“if a person is willing to sell his parcel that is located in the marginal area and the buyer wants to buy a parcel next to Maasai Mara - Narok road, the committee swaps the parcel with someone’s at a preferred place without the consent of the original owner”. A few cases have surfaced but the victims have taken no drastic actions. This is a critical issue, as the outcome is isolation of the victim community members - original owners of parcels in strategic locations, who did not intend on selling their parcel while the benefits go to the selfish committee members who cash in from the exchange and the buyers who get more ‘good’ land. By and large, the sale of individual parcels compounds some of the negative implications already presented such as mobility restriction as a result of fencing, social and economic marginalization.

From the long list of grave nature of the negative impacts of the tenure reform in MM, it is true to say that process presents (some) community members with more challenges than opportunities to address the problem of CC. In the following chapter, thoughts on how to address the tenure reforms’ negative impacts on local livelihoods are presented.

8. Future approaches to address the negative impacts

About half of the study participants maintained that the difficult situation faced by the MM community members was out of hand, and that they did not have any ideas on how the negative impacts of land privatization on local livelihoods can be addressed. The rest provided some decisive suggestions for future actions that could be taken. This chapter presents the various propositions offered, which include an effort to continue pastoralism, intensification in livestock keeping, external support for local diversified livelihoods and advocacy and campaigns on key negative privatization impacts.

8.1. *De jure* private holdings but *de facto* communal

Already acknowledged in this study is the fact that pastoralism is the most effective livelihood strategy considering the heterogeneous nature of the heavily depended-on water and pasture resources found across MM's landscape. Traditionally, rangelands are managed collectively and not by individual households "due to their inherent spatial and use characteristics" (Zhaoli et al. 2005: 45). Tucker (1999) emphasizes on the importance of maintaining common arrangements since privatization of individual parcels limits the success of mobilizing resources among users in the fragmented larger area. In this context, upon privatization, any possible effort to maintain the collective pastoral features, particularly livestock mobility to maintain wide landscape access is significant. This explains why after rangeland privatization of the Tibetan plateau pastoralist communities in China, half of the rangeland is managed collectively through establishment of groups of households comprising three categories: "...kinship groups, e.g. brothers and sisters or cousins; ...legally sharing the same summer pasture ...the most common type is that several households allocated rangeland in adjacent areas spontaneously organize themselves to manage their livestock and rangeland together (*Ibid*: 46). A similar consideration is becoming prominent among MM residents. In most interviews, and both focus group discussions, it was appealed that despite the new tenure system - *de jure* private holdings, members should maintain their old way of utilizing the land under *de facto* communal tenure arrangement. During the focus group discussions, the youth and the women there be a communal meeting to convince the community members with individual parcels to permit a continuation of shared use of land resources commonly despite possession of individual titles. Most community member who predominantly depend on livestock from their livelihood feel it is better off using the land communally than privately.

When asked what the future solution for the dreaded privatization outcome was, an elderly/male respondent (28) replied: "the only way to survive is to take the titles, but keep using land communally". Other respondents shared this perspective but felt it was not possible to execute due to various twists: cases of land sales that have resulted in locals' land being dispossessed, hence having outsiders as owners of part of community land breaks the communal link members have; and parcels' fencing which also limit the possibilities of collective use of parcels. Nonetheless, as was proposed by some local residents, families whose parcels are located next to each other should combine them and create a family ranch. In Kajiado County, the Maasai community members are relying on reciprocity based on social capital – household sharing, rotating herds between locations, and grazing networks as means to continue accessing resources

within privatized rangeland (Galvin et al. 2008). In a similar way, MM residents will continue to be able to exercise some level of mobility across the rangeland. It should be recognized, however, that internal challenges might arise in maintaining such an arrangement. Drawing from the Zhaoli et al. (2005) study mentioned above, there should be established formal rules to regulate the groups and avoid conflict that may arise from various issues such as herd size differences, labour contribution, non-group members' relatives' livestock entrustment.

8.2. Intensification in livestock keeping, reliance on local knowledge and technology

A few MM residents feel the 48 acres, under effective management, could support a number of livestock, and hence could still provide households with a decent livelihood. An intensive livestock keeping approach besides pastoralism could be an option for MM residents. After all, if confined within the privatized parcels, individuals/households will have to limit the number of livestock to the amount of forage available within the parcels. A study among pastoralists in Botswana by Behnke (1987) showed that there can be considerable gains for the pastoralists when they practice relatively high standards of management: fencing, paddocking, and piped water within a private land. This empirical evidence of intensification within pastoral community, however, was conducted with a relatively large ranch and a herd of about 120 cattle heads (actual size not mentioned). MM residents believe a similar livestock-intensive method can be achieved within the privatized parcel through external support to ensure availability of water for the livestock in the relatively marginalized areas, reducing the number of livestock kept and conducting *paddocking* i.e. dividing a parcel into small portion and rotating seasonally around them.

Another emerging form of intensification, mentioned earlier, involves adoption of 'improved' livestock breeds. The Maasai located next to Amboseli National Park, in Kenya are known for such an approach by keeping mixed breeds between local Zebu cattle and Sahiwal or Boran Zebu sub-breeds, which provide higher milk and meat production, respectively (Galvin et al. 2008). As further pointed out, there are challenges associated with this investment: "high costs in terms of forage and water requirements, increased veterinary costs, inability to walk long distances, and drought intolerance", but the gains – "45-65% higher prices of the animals in the marketplace" outweigh the costs incurred. Again, this is a plausible effort that MM residents, with the external financial support, could undertake to bolster their livelihood.

In their review of African pastoral production systems, Nyakiri and Ngugi (2002: 248) call for a "turn to post-modern approaches, which entail subjective interpretation and valued local knowledge, rather than scientific methods of inquiry and empirical testing" to better understand pastoralism. As such, the local knowledge to address the problem of pasture under privatized tenure should be acknowledged. As indicated earlier, due to the problem of the impacts of CC, keeping goats and sheep instead of cattle has been considered a better option since the goats and sheep have been associated with less demand in their eating habits even during dry season, they are easier to treat financially in case of health problems and they also sell faster in the market. Possibly all MM residents should continue with a similar trend under private i.e. keeping goats and sheep, to maintain the livestock livelihoods under limited pasture.

A few MM residents brought up an interesting proposition to increase livestock efficiency that calls for a technological aid that can predict the increasingly erratic changes in weather patterns. There have been advances in climate forecasting technology aimed at providing accurate forecasts of seasonal variation in rainfall patterns (Luseno et al. 2003). Technologies to monitor forage levels in East Africa following the increase in drought incidences are getting progressively more popular (Jama et al. 2003). Knowing when there will be rain, thereby being aware of when pasture will be available, will ensure community members make informed decision on livestock management under smaller parcels in the context of CC. By being able to predict difficult weather, community members can take appropriate actions such as selling livestock before drought periods and investing the money elsewhere thereby avoiding catastrophic loss (youth/male & adult/female respondents 05 & 06).

8.3. Need for external support for diversified local livelihoods

As presented earlier, water for the marginalized MM community members will be one of the hardest challenging arising from the tenure change on livelihoods. Therefore, there is a need for increased availability of this basic necessity. The poor community members are not in a position to establish water infrastructure, hence they call for support from the government and/or non-governmental organization to set up water sources in convenient places for everyone, by for instance drilling boreholes in the isolated places in the community. If there is surplus of water, some households can also use it to do farming (adult/male & adult female respondents 01 & 06). At the same time, there should be a related effort in providing other social facilities such as schools and health care centres where the marginalized community members, since as indicated earlier, there are only a handful of them unevenly distributed across MM landscape.

As indicated before, good health is imperative to pursuing livelihoods, and convenient access to health care will result in time and money being saved which can be in turn used to earn a livelihood. The MM community members acknowledge education for their children as a future tool for alternative livelihoods, however, given the poor education infrastructure and poverty, only a few have this opportunity. Furthermore, the situation is bound to worsen. Access to limited distant schools for the families located in isolated areas and the high cost in term of school fees as pointed out during this study, prevent households from sending their children school. Building more schools in the isolated areas will reduce the distance challenge.

Last but not the least, there is also a need for improvement in terms of other physical structures. In the whole of MM region, there are no paved roads, the mobile phone network is patchy and there is no electricity besides a newly established yet to be connected power grid in one of the shopping centres in MM, MM centre. These socio-economic infrastructures are crucial to earning livelihoods by facilitating transport, communication among other benefits. However, the impoverished pastoral MM community members are not in a position to take such costly investments, there, support is required from external support from the government and/non-governmental entities.

8.4. Advocacy and campaigns on key negative privatization impacts

Some of the key negative implications of privatization in MM, intentional marginalization and land sales phenomenon suggest that the community members affected were ill prepared for such consequences from the tenure transition. As pointed out earlier, the issue of people selling land for wasteful commercial purchases eludes individuals unfamiliar with the money economy and investment. During this study, a number of MM residents maintained that these problems necessitate an intervention.

Regarding the problem of land sale, an effort to prevent continuing illegal transfers should be initiated in MM through campaigns and or advocacy, making women aware of their rights to land, and that the buyers should seek their consent if their husbands were to be selling land (women focus group discussion). In the discussion, the women also added that corruption in the government land transfer ministry and by the GR committee should be fought in order to eliminate chances of back door land deals. Furthermore, as youth/male respondent 18 proposed “a sensitization on the dangers of selling land to individuals (and family members of those) planning on sell their parcels or a portions without an unavoidable necessity should do initiated”.

Regarding the problem of intentional marginalization, such as privatization of public water sources, protests over issue of land grab of public utilizes, or by GR officials as reported in Elangata Wuas (K24 2014) could be imperative. In MM, some members have proposed protest against the privatization of water sources in an effort to refute such collectively unwarranted allocation. On a more general note, a youth/male respondent (18) suggested that since most people are not yet aware of the implications they are about to face due to privatization, including the implications of such actions as fencing, land sale impact etc., a platform to share knowledge on all these issues and the implications on local livelihoods should be set up.

9. Conclusion and discussion: Valuable future lessons and recommendations

In this study, the case of MM shows how the community members are experiencing and perceiving the impacts of CC, their adaptation and coping strategies, and most importantly provides insight on the influence a particular socio-economic internal driver of change, *land privatization*, has on individuals' or households' adaptive capacity and vulnerability to CC impacts. This chapter expands on valuable knowledge garnered from this study, stressing the need for a holistic approach to establishing how pastoralist communities members are being affected by the effects of CC in the context of on-going land tenure reform.

This thesis affirms that pastoralist communities in Kenya (and beyond) are experiencing the impacts of CC. As the local residents explained, the MM region is seeing a significant variation in the weather including temperature rises in odd periods of the year, increasingly reduced and unpredictable precipitation and an upsurge in the incidences of droughts and livestock and human diseases. The change in temperature and precipitation and incidences of droughts have been accompanied by a relative decline in the availability of the highly depended on resources, water and pasture (for the livestock), and hence causing increased livelihood struggle. This change adds an additional burden to the common problem of water and pasture that characterizes MM pastoralist community and others located within ASALs where low rainfall, relatively high temperatures and droughts are norm. To adapt to the impacts on water and pasture, MM residents have relied on key pastoralist features, mobility and social capital, which have played a fundamental role in ensuring vast landscape coverage, *extensive pastoralism* to acquire these resources, and alternative livelihoods to supplement the weakened pastoralism. Generally, the impacts of CC are manifested through the detrimental effects it is having on the livestock-based livelihood system.

It is crucial to note that the impacts of CC affect MM members differently at the household level and at the individual level. On a household level, some households are more invested and reliant on pastoralism while others are less so. Besides a few wealthy families who have large herds, most households are heavily reliant on pastoralism and have relatively few livestock and so tend to have fewer resources, a low socio-economic status, and low levels of education. The elderly and female-headed (widows) households belong to this category. As a result, these households have a low adaptive capacity to the impacts of CC and so are pressed harder by the impacts in their livelihood pursuit. Families with large herds are better able to adapt to CC effects. As was presented earlier, a high number of livestock acts as a security measure against the risk of unfavourable weather. For instance, a large number of livestock acts as a form of insurance in case of a drought where some of the herd may die. The families that have been able to successfully diversify are typically wealthier families with higher levels of education, and young people (families) who have more energy and therefore can find other jobs such as wage labour outside pastoralism. The few households of the community members who got allocated an irrigation plot can also be categorized as among those who have been able diversify through crop cultivation. Farm production acts as an alternative livelihood option for these families in addition to the CC challenged.

On an individual level, under customary tenure, men and women have different roles and responsibilities, and are thus affected differently by the impacts of CC. Besides taking care of domestic chores such as fetching firewood and water and preparing food, women have become increasingly responsible for herding as well because children who tend to be go herding are now attending school in most households. Men are only responsible for herding and sometimes they do not, so either their wives or children are responsible. As mentioned earlier, in some families, men have become exceedingly uninterested in the households' livelihoods. As such, women have more responsibility in terms of workload. All of these are new responsibilities, most of which have been brought about by CC and include getting water and herding. Furthermore, in MM, there are more educated men than women; hence men are more advantaged in this front too, which bolsters their adaptive capacity.

Another vital community-related aspect picked from this study concerns the importance of understanding local people's perceptions of the CC impacts, which should be regarded essential to local adaptation efforts. The local perceptions of CC impacts are significantly different "even within a small geographic area" as seen in the case of Eastern Tibetan villages (Byg & Salick (2009: 156). As further informed by Byg and Salick (*Ibid*), peoples' perceptions of CC and its impacts affect how the problem is dealt with, including the solution that is perceived relevant to address the problem. Thus, the local people's outlook should be integrated in the future adaptation endeavours. The local perceptions are also relevant on a policy level, as they signify the concerns among the locals and help clarify the definite impacts from the local lens which is impossible to estimate through scientific models (Danielsen et al. 2005; Laidler 2006; Aalst et al. 2008; Byg & Salick 2009). The understanding of CC impacts among selected MM residents, and correspondingly among some Eastern Tibetan villagers comprises of "moral and spiritual" elements (*Ibid*: 156) whereby the negative impacts are linked to super natural deities. However, from a scientific point of view, CC is a naturally occurring or even human induced phenomenon. The moral and spiritual interpretation among MM residents expresses how they perceive CC impacts, which affects how phenomenon is dealt with in the future. It is worth noting here that individuals with such an interpretation also strongly feel that the solution should take moral and spiritual lines. As such, perhaps taking a religious approach to impart the scientific knowledge of CC will be necessary. Dealing with this discrepancy concerning the understanding of CC impacts affects local people, external governments, and non-governmental entities. Knowledge sharing about CC should be an essential component of adaptation. As stressed by Byg and Salick (2009: 166) "policies and projects aiming at promoting adaptation will only be relevant to local people if such differences are taken into account".

It is evident from the case of MM that CC has caught up with the pastoral communities and that it is affecting local people differently. However, pastoralist communities have received little attention in terms of how they are affected by CC. This study, therefore, calls for attention to bring pastoralists into the debate, discussion, and policy dialogue about CC in order to address this issue.

As highlighted earlier in this document, the conventional CC assessments have broadly focused on the impacts of climate change on a livelihood system, with no attention given to other on-going critical livelihood dynamics induced by a variety of forces in rural areas: land tenure reforms, population growth, rapid urbanization and migration, education expansion, diversification, income inequality, and technological innovation among others. Interestingly, even external CC interventions have established a significant force in local communities (Frerks 2007). These forces need to be appreciated in order to effectively understand how CC is impacting local communities.

The case of land tenure reform in MM sheds light on how these forces (may) influence CC impacts and local adaptability to CC. Land privatization in MM introduces significant institutional changes to how local people access livelihood resources (land and land resources) which in turn affect the livelihood strategy adopted and consequently shape community members' vulnerability or adaptability to the changing climate. In other words, the tenure reform has impacts on livelihoods through a shift in natural resource management in MM. The conversion of MM collective to individual free holdings, which is a major tenure transformation in the region and other pastoral regions in Kenya and beyond, is having two radical implications, which are categorized as: opportunities for individuals and households to adapt to the changing climate impacts and negative implications that enhance CC impacts and undermine individuals' and households' ability to adapt. The tenure change has introduced major livelihood dynamics, positive and negative, among MM Maasai residents that widens or constrains their ability to deal with CC. Firstly, increased diversification pathways, mostly popular among young people, top the opportunities expected from land privatization in MM. Land privatization opens up chances for a more extensive utilization of the rich natural resources available in the region, a move not possible under collective tenure. Those allocated in areas rich in natural resources such as trees, sand, and building stones can earn income by privately selling these resources. In terms of livestock keeping, those with pasture but no livestock can rent or sell pasture to the fellow community members who have large herds and need extra pasture to feed their livestock. Another remarkable positive influence entails an increase in economic prospects for women, whereby land rights and sedentarization following privatization creates room for new economic activities. By settling down and building permanent houses, women get time and space to engage in various economic activities outside livestock production. Also, by gaining land rights, women get to be more involved in land issues and thereby promote their socio-economic rights in the community. All of these new opportunities enhance adaptive capacity in the community.

The negative implications of land privatization in MM are overwhelming. For some community members, the impacts related to the tenure change are not only making it difficult to sustain a livelihood, but are contributing to its complete loss. In terms of livestock-based livelihood, land fragmentation, which is being accompanied by fencing, particularly by the rich members of the community, means an end to (livestock) mobility, a pastoral feature essential for access of limited resources – water and pasture that are sparsely (especially presently) available across the landscape. Individual parcels' fencing makes long distances to the few available watering points even longer. Socio-economic and ecological marginalization as a result of fraudulent subdivision and individual parcels allocation has worsened the problem of limited access to water

and pasture resources and social facilities. The highlighted opportunities from exploitation of natural resources are skewed towards the privileged few. Distressing land sale deals are on the rise in MM and have adverse livelihood implications for the local individuals and households who get resources dispossessed off the valuable land/land resources. Majorly, women and children are the key victims from the on-going unendorsed land transfers. It has also been established that privatization in MM may lead to conflicts in the future, as well as negative affects to the wildlife industry, which in turn will also have negative impacts on local livelihoods.

To address the negative implications of the tenure change and consequently improve community members' capacity to cope with CC impacts, several strategic approaches are instrumental. The first is an effort to try and maintain mobility, particularly by ignoring the *de jure* private tenure system to maintain collective use, to maintain the predominant pastoralism livelihood; it was recommended the community member continue use of land as communal despite having private rights to land. This can be achieved through groups of members or family members combining parcels to create ranches. This way, people will still manage to access limited resources across the landscape. Second, if privatization settings are retained, on a policy level, there is a need for new means to support the local community members so that they can reap benefits from the tenure arrangements. Institutional innovations that promote livestock keeping under the new tenure system to evade the negative implications are necessary, particularly investment in pastoral infrastructure e.g. in water availability. Perhaps financial support to promotion keeping mixed-livestock breeds that fetch more money in the market use of technology to monitor unfavourable future weather conditions, as indicated earlier. Also, reliance on local knowledge is crucial to increase resiliency such as keeping smaller livestock that are easier to manage, especially under diminishing water and pasture resources. Third, there is a need for increased support for livelihood diversification among MM residents, through various ways, including general investment in education such as subsidizing access to education among poor households and general investment on education infrastructure. Similarly, other socio-economic infrastructures such as health centres also need to be made reachable especially among the people who have been allocated land in isolated places. Lastly, there should be more advocacy and campaigns to address intentional negative privatization impacts such as illegal land sale deals and privatization of common utilities. Most of the illegal land transfers were possible because the wives of (male) land sellers were not aware of their land rights. By making women aware of their land rights through awareness campaigns, such unjustified deals can be halted. Similarly, public utilities allocated to individuals can also be recovered through advocacy and campaigns, as seen in the case of Elangata Wuas, discussed in this document, where local people have protested illegal allocations.

The tenure change – which concerns livelihood dynamics and their influence on CC impacts and local people's ability to adapt to the impacts - are based on the long-term projection of the future of the community following the tenure transition. However, as stressed by Scoones (2009), “without attention to these long-run, slow variables in dynamic change, a snap-shot view describing desperate coping may miss slow transformations for the better – as people intensify production, improve environmental conditions, invest or migrate out”. As such, it is not fully conclusive to ascertain the future of all the tenure transition's

livelihood dynamics and their influence on the on-going efforts to adapt to CC impacts. Therefore, there is a need for continuous monitoring of how the different livelihood outcomes unfold in MM in the future.

This study covers fundamental issues relating to the topic of CC among poor communities. Due to the sensitivity of the topic of land in the research region, the short period during which this study was conducted, and the nature of the research (qualitative), a more open and detailed exploration was not successfully realized. Therefore, there is a need for more substantiated data on the issue. While the knowledge of how MM community members experience CC is crucial, more details on the actual changes in weather, e.g. more quantified data on rainfall, season changes, droughts and temperatures are needed. A more technical and constant monitoring for an extended period of time is called for. Such information is crucial to understand the actual impacts of the weather changes on the availability of water and pasture for livestock. To gather such data, a more quantitative longitudinal research approach is needed. Again, to measure the actual level of inequality in terms of land and land resource quality that exists, a quantified inventory on resources available in the region is necessary.

Summing up, this thesis also calls for more research into livelihoods dynamic population growth, urbanization, and human development changes in various communities facing CC impacts. Other research should focus on the need for inclusion of ASALs' pastoralists' communities in CC research and policy design, since historically they have been significantly marginalized, politically and socio-economically.

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Appendix 1: Lead research open questionnaire

Introduction and informed contest

My name is James Wangu, a master student at Utrecht University in the Netherlands. I am conducting a study on how this community is adapting to the changing climate, which is part of my education, a requirement to graduate. I am working with The Indigenous Livelihoods Enhancement Partners (ILEPA), formally touch of love, an NGO I presume you are familiar with. The study is part of a bigger Utrecht University research project, CoCooN - Conflict and Cooperation in the Management of Climate Change – integrated project, that is aimed at enhancing people’s adaptive capacity to climate change, particularly by focusing on small-scale farmers and pastoralists in the arid and semi-arid regions here in Kenya, Ghana and Burkina Faso.

This interview is aimed at understanding the community knowledge on the issue of climate change, present climate change challenges in this region. There are no direct benefits in participating in the interview. However, the study will provide crucial information for policy development that are aimed at helping pastoral community adapt to the changing climate. Please know that your information during the interview will be treated confidentially and will only be used for research purpose. Feel free to refrain from answering questions that you are not comfortable with. If you choose not to continue with the interview, feel free to say so. The interview will last around 1 hour.

I thank you in advance for your cooperation.

Beginning of the questionnaire

Respondent age group: *[Youth]* *[Adult]* *[Elderly]*

Date _____

a) Regarding climate change

1. Are you aware of the change climate? Please elaborate
2. What are the implications of the change in this community? Please elaborate
3. How has climate change impacted access to water and pasture? Please elaborate
4. What have been the community’s strategies to addressing the challenge of access to water and pasture?
Please elaborate
(Probe if not discussed)
 - Mobility
 - Kinship/relatives/community/neighbors joining hands in search for pasture?
 - Mobile technology
 - Agriculture
 - Business
 - Digging boreholes
5. Has anyone, any organization, and government provided information on climate change? Please elaborate
6. Has there been rules, norms guiding access to water and pasture during dry season? Please elaborate

b) Regarding land privatization, and climate change

(Targeting issues of land privatization)

1. What changes is the community experiencing in terms of how natural resources (land and land resources) are managed in this community?
2. How do you feel about the change? Are you satisfied with the change? Why or why not?

What do you think is/or will be the outcome of the tenure change in terms of water and pasture scarcity (due to climate change)?

1. Institutional changes: due to tenure change

- a) Does/will privatization brings a change on how community members access water and pasture?
(Change in rules and norms governing access to water and pasture under communal land system)
- Restriction to private parcel - immobility
(Social capital: changes in cultural institutions such as age-set, family ties - Individualism: Little possibility to practice traditions in an elaborate manner that maintains solidarity in the community)

2. Land sales to outside community

- a) Are you familiar with the issue of land sales in this community?
b) Does/will the ongoing land sales influence access to water and pasture?
c) Does/will land sales increase the community's vulnerability to climate change by enhancing poverty?
(Entry of different ethnic groups)

3. Parcel allocation and title issuing

- d) Does or will the parcel allocation to an individual make easier or harder access to water and pasture during dry climate?
e) Were there cases of corruption in the parcel allocation and other complications during allocation and title issuing process?

4. Women and private property rights? (For women respondent mostly)

- f) Does/will the role of women in the community change following land ownership?
g) Is it ok for women now own land?
h) Should women be allowed to make decision on how land is used?

Future solutions

With land privatization and the challenge of water and pasture due to climate change, what do you propose as a way forward to ensure the problem of water and pasture is addressed?

Appendix 2: Maji Moto GR demarcation map



Appendix 3: Map of Agricultural Plots in Maji Moto, next to the hot spring

