



## AN ABSTRACT OF THE THESIS OF

Shiloh Forest Sundstrom for the degree of Master of Science in Forest Resources on March 17, 2009

Title: Rangeland Privatization and the Maasai Experience: Implications for Livestock Herding, Open Space, and Wildlife Conservation in Southern Kenya.

Abstract Approved:

---

Joanne F. Tynon

For centuries in what is now southern Kenya and northern Tanzania, nomadic, Maasai livestock herders have coexisted with vast populations of wildlife. Today, both wildlife and the Maasai herding lifestyle, a vital component of Maasai culture, are threatened by changes to the landscape and losses in mobility, including the policy of privatization and subdivision of communally owned Maasai Group ranches in Kenya. Based on the claims and practices of Maasai livestock herders living in southern Kenya as well as observations and conversations with key informants, this study describes the relationships between traditional livestock herding, open space, and wildlife and how subdivision as affected traditional livestock herding as a land use. Key findings were that the subdivision presents both challenges and opportunities for conservation Maasai communities. This study provides new insights into how livestock herders are adapting to privatization and how subdivision is affecting traditional decision-making and social interactions regarding natural resource management and the ability to adapt to a changing climate.

Subdivision has fragmented the social and biological landscapes that the Maasai have traditionally relied on for subsistence. Subdivision has made it difficult for livestock to access water and to negotiate dry seasons and survive droughts. Elders no longer have jurisdiction over livestock herding, and migrating to seasonal pastures is no longer feasible for many livestock herders as subdivision has brought an end to communal reserves. Traditional resource management and sharing mechanisms are threatened by subdivision and the selling of land to outsiders. Many landowners are sharing access to grazing land and water resources in order to continue keeping livestock. Because of subdivision wildlife/human interactions have increased and, in some cases, wildlife are no longer present in great numbers. Other factors contributing to the difficulties brought about by subdivision include climate change and human population growth.

© Copyright by Shiloh Forest Sundstrom  
May 17, 2009  
All Rights Reserved

Rangeland Privatization and the Maasai Experience: Implications for Livestock  
Herding, Open Space, and Wildlife Conservation in Southern Kenya

by  
Shiloh Forest Sundstrom

A THESIS

submitted to

Oregon State University

in partial fulfillment of  
the requirements for the  
degree of

Master of Science

Presented March 17, 2009  
Commencement June 2009

Master of Science thesis of Shiloh Forest Sundstrom  
presented on March 17, 2009.

APPROVED:

---

Major Professor, representing Forest Resources

---

Head of the Department of Forest Ecosystems and Society

---

Dean of the Graduate School

I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes the release of my thesis to any reader upon request.

---

Shiloh Forest Sundstrom, Author

## ACKNOWLEDGMENTS

There are so many people, both in the U.S. and in Kenya whose support, help, friendship, and advice has been instrumental in the completion of this project. My family has always supported me in everything I have done in my life and I thank them for trusting me and offering encouragement throughout this endeavor. Thank you mom, dad, and Danell. My advisor, Joanne Tynon, from the very beginning has supported me in my aspirations to go to Kenya and always been there whenever I needed help. Thanks Jo! I would like to thank my committee members, John Bliss, Badege Bishaw, Hannah Gosnell, and Dan Edge for their friendship and wonderful ideas. I would like to thank David Western for inviting me to Kenya and providing me with ideas and guidance throughout the project. Thanks to the staff at the African Conservation Centre including Samantha Russell and Godfrey Masinde. I would like to thank John Kamanga and Paul Melliera of the South Rift Landowners Association for connecting me with the people of Maliua and teaching me about the Maasai. Special thanks to Paul and his family for putting me up in their home and making sure I was safe, sound, and never hungry. My research assistant, Simon, was instrumental in connecting me with community members and showing me around, without his help I could have never achieved what I have. Thanks to Nish Lakhani and Suntrek Safaris for providing me a vehicle while I was in Kenya. Thanks to Nickson Parmisa and his family, who put me up when I needed a break from fieldwork and taught me a lot about livestock herding and Laila Delorie and her family

for their hospitality. Special thanks to all of my friends in Corvallis who supported me and offered me advice throughout my time in graduate school, not to mention all of the good times. Many thanks go to Laura Kennedy for encouraging me to go to Kenya and for connecting me to the African Conservation Centre in Kenya. I would like to express my gratitude to the following individuals and organizations that have supported my project financially and administratively: Oregon State University, the African Conservation Fund, Robert Jacobs, and many other individuals who supported my project through donations. Last but certainly not least I would like to thank the residents of Mailua Group Ranch for welcoming me into their homes and sharing their experiences with me.

## DEDICATION

This thesis is dedicated in memory to my friends Reggie Poyau and Alusine Kamara, and my uncle Stephen Gilmer all of who inspired me to go to Africa. I thank Reggie for his humor and teaching me that the best way to make a difference is by understanding the root causes of poverty and empowering local people. I thank Alusine for teaching me about Africa and showing me how to never give up on any task, be it large or small. I thank Stevie for his huge heart and enthusiasm for all things in life and his support for this project.

# TABLE OF CONTENTS

	<u>Page</u>
<b>CHAPTER ONE – INTRODUCTION.....</b>	<b>1</b>
Purpose of Study.....	3
Justification.....	4
<b>CHAPTER TWO – LITERATURE REVIEW.....</b>	<b>5</b>
Natural and Social Capital.....	5
<b>Setting the Stage: Resource Management and Land Use and Tenure Change.....</b>	<b>6</b>
Traditional Pastoralism and Land Tenure.....	6
Colonial Land Policy and the Creation of Group ranches.....	9
Group ranch Subdivision.....	13
Predicted Consequences of Land Subdivision.....	14
Ecological Consequences of Subdivision and Fragmentation.....	17
Consequences of Land Subdivision for Traditional Pastoralism.....	18
Agricultural Development in Africa.....	20
Rangeland Privatization Elsewhere in the Developing World.....	21
Wildlife Conservation and Tourism.....	25
<b>Changing the Status Quo: New Ideas for Conservation and Natural Resource Management.....</b>	<b>27</b>
Community-Based Conservation.....	27
Ecotourism.....	30
Wildlife-Livestock Integration.....	31
<b>CHAPTER THREE – METHODS.....</b>	<b>33</b>
Qualitative Methodologies.....	33
Case Study Research.....	34
Study Area.....	34
<b>FIGURE 2: Map of Study Area Group Ranch (study area in red).....</b>	<b>36</b>
<b>Data Collection.....</b>	<b>36</b>
Semi-structured Interviews.....	37
Observational Data Collection and Key Informants.....	40
<b>Data Analysis.....</b>	<b>41</b>
<b>Limitations of the Study.....</b>	<b>42</b>
<b>CHAPTER FOUR – RESULTS.....</b>	<b>44</b>
<b>Livestock Herding and Maasai Traditions Prior to Subdivision.....</b>	<b>44</b>
Communal Living and Sharing.....	44

Natural Resource Management and Livestock Herding .....	46
Environmental Impacts and Wildlife Interaction .....	48
<b>History of Mailua Group Ranch Subdivision.....</b>	<b>49</b>
<b>Research Objective One – Subdivision Effects on Livestock Management and Responses to Seasonal Constraints .....</b>	<b>54</b>
Loss of Traditional Grazing Reserves Due to Subdivision .....	54
Subdivision Effects on Livestock Mobility and Access to Grazing Land.....	54
Subdivision Effects on Water Access .....	55
Subdivision Effects on Livestock Numbers .....	58
Changing Livestock Breeds .....	62
<b>Research Objective Two – Subdivision Effects on Decision-making Processes of Maasai Livestock Herders .....</b>	<b>65</b>
Individual Land Management and Decision-Making.....	65
<b>Research Objective Three – Subdivision Effects on Maasai Social Networks and Cooperation Regarding Natural Resource Management .....</b>	<b>67</b>
Subdivision Effects on Communal Living and Sharing .....	67
Conflict Over Property Boundaries and Access to Resources .....	68
Subdivision Effects on Relations with other Maasai Communities .....	70
Pasture Agreements and Cooperation Between Individuals .....	72
Selling Land and the Effects on Maasai Traditions .....	79
<b>Subdivision Effects on the Landscape and Future Opportunities for Conservation and Development.....</b>	<b>83</b>
Cultivation .....	83
Deforestation and Charcoal Burning.....	85
Wildlife Interaction Effects of Subdivision .....	88
Opportunities for Community-Based Conservation.....	91
Climate Change.....	95
<b>Livestock Herding as a Contemporary Land Use.....</b>	<b>97</b>
<b>Future of Maasai Traditions and Livestock Herding in Mailua.....</b>	<b>99</b>
<b>CHAPTER FIVE – CONCLUSIONS.....</b>	<b>106</b>
<b>Summary and Discussion .....</b>	<b>106</b>
Research Objective One – Subdivision Effects on Livestock Management and Responses to Seasonal Constraints .....	107
Research Object Two – Subdivision Effects on Decision-Making Processes of Maasai Livestock Herders.....	110
Research Objective Three – Subdivision Effects on Maasai Social Networks and Cooperation Regarding Natural Resource Management .....	110
Subdivision Effects on the Landscape and Future Opportunities for Conservation and Development .....	113
Future of Maasai Traditions and Livestock Herding in Mailua .....	116
<b>Implications for Traditional Livestock Herding and Conservation.....</b>	<b>116</b>
<b>Recommendations and Conservation Opportunities.....</b>	<b>119</b>
<b>Future Research.....</b>	<b>121</b>

<b>REFERENCES CITED.....</b>	<b>123</b>
<b>APPENDIX A – INTERVIEW GUIDE .....</b>	<b>131</b>

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. MAP OF KENYA (APPROXIMATE STUDY AREA IN RED).....	35
2. MAP OF STUDY AREA GROUP RANCH (STUDY AREA IN RED) .....	35

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. INDIVIDUAL INTERVIEW PROFILES.....	38
2. GROUP INTERVIEW PROFILES.....	39

## CHAPTER ONE – Introduction

For centuries in what is now southern Kenya and northern Tanzania, vast populations of wildlife have coexisted with nomadic livestock herders like the Maasai. Traditional migration schemes and range management strategies of Maasai livestock herders have complemented the resource needs of migrating wildlife; these traditions allowed the Maasai and wildlife to live side by side with little conflict (Berger, 1993; Boyd, et al. 1999).

Specific government policies including changes in land tenure, and the financial rewards of agriculture have encouraged changes in land use and increased cultivation in unprotected areas traditionally used for livestock and wildlife grazing (Brady & Weil, 1999; Okello, 2005; Okello & Kiringe, 2004; Reid, Thornton, & Kruska, 2004; Seno & Shaw, 2002). Today, the Maasai herding tradition, a vital component of Maasai culture, and the vast populations of Kenya's world famous wildlife are threatened by losses of habitat and the difficulty of migrating across the landscape (Nightingale & Western, 2006; Reid et al., 2004; Seno & Shaw, 2002).

Sixty-five percent of Kenya's highly mobile wildlife population is found outside of parks and reserves (Western, Russell, & Mutu, 2006) and the survival of wildlife depends on migration corridors and dispersal areas outside of parks and reserves (Ogolla & Mugabe 1996, Akama, 1999). Therefore, the conservation of these areas, including Maasai group ranches in southern Kenya, is necessary to protect Kenya's wildlife (Western, 1989; Western et al., 2006). These group ranches were established by the Kenyan government

beginning in 1968 when communally owned Maasai lands were divided into smaller plots of land and those living on the ranches were given shared title to the land (Ogolla & Mugabe, 1996; Serneels & Lambin, 2001).

Land tenure changes are considered a major threat to both wildlife populations and traditional livestock herding in Kenya (Okello, 2005; Okello & Kiringe, 2004; Reid et al., 2004; Seno & Shaw, 2002). Specifically, the creation of national parks and other protected areas has alienated the Maasai and their livestock from traditional grazing lands (Reid et. al, 2004). The subdivision of communal lands into group ranches beginning in 1968 has led to the collapse of traditional practices and limited livestock access to adequate grazing and water supplies (Ogolla & Mugabe, 1996). These losses have resulted in land degradation and soil erosion from overgrazing within the group ranches. Despite these changes, livestock herding has remained the most important land use for the Maasai, as they were able to adapt much of their traditional way of life to the group ranch system (Bekure and Ole Pasha, 1990).

Maasai group ranches across southern Kenya are in various stages of dividing group ranch lands into individually owned plots of land. According to Okello & Kiringe (2004) this subdivision of Maasai group lands into individual plots of land, as promoted by the Kenyan government, may dramatically affect wildlife in parts of southern Kenya by fragmenting important wildlife dispersal areas and further isolating national parks. Further, it is expected that individual plots of land will be less productive for livestock and conflicts will

arise as herders trespass into protected areas in search of forage (Seno & Shaw, 2002). Group ranch subdivision may also give rise to inheritance problems, exacerbate the marginalization of women, and result in the permanent loss of land sold to land speculators during drought and other times of hardship (Seno & Shaw, 2002).

### **Purpose of Study**

The purpose of this study was to describe how group ranch subdivision has affected traditional livestock herding as a land use and affected the relationships between traditional livestock herding, open space, and wildlife. More specific objectives of this study were to: (1) explain how subdivision of group ranches has affected Maasai livestock management and responses to normal seasonal constraints (dry season vs. wet season) and major climatic events (droughts), (2) examine how group ranch subdivision has affected the decision-making processes of Maasai livestock herders, and (3) describe how the subdivision of group ranches has affected Maasai social networks and cooperation regarding natural resource management. This study provides new insights into how livestock herders are adapting to privatization and how subdivision is affecting traditional decision-making and social interactions regarding natural resource management and the ability to adapt to a changing climate.

## **Justification**

Livestock herding remains an important land use for the Maasai and much of the wildlife habitat in southern Kenya is found on these lands. Unlike range livestock systems in developed countries like the United States and Australia, where livestock managers earn a living from livestock, the lives of many pastoralists in Africa, including the Maasai, depend heavily on livestock. A rancher in Australia may go bankrupt if he loses all of his cattle, but in Africa, if a pastoralist loses his livestock, serious consequences can include starvation and death (Cossins, n.d.). Further, Western (1989) suggested that “land beyond parks is the best hope and biggest challenge for biological conservation” yet this “can only succeed by adapting philosophy and methodology to local conditions, whether cultural, economic, religious, or political” (p.165). Therefore, it is important to understand how changes in land tenure are affecting natural resource management in these areas. Exploring the post-subdivision experiences of Maasai livestock herders sheds light on the shifting relationships between livestock herding, open space, and wildlife and helps identify community-based conservation opportunities that integrate the needs of local people with efforts to conserve wildlife and other important natural resources.

## CHAPTER TWO – Literature Review

The following review of literature introduces the theoretical concepts of natural and social capital and provides an important historical background about natural resource management, land tenure changes, and land use change in East Africa. It also includes examples of research from other parts of the developing world concerning pastoralism and changes in land tenure.

### **Natural and Social Capital**

Natural capital and natural income are defined simply as “the stock and flow components, respectively, of natural resources” (Costanza & Daly 1992). For example, “as stock or population of trees or fish provides a flow or annual yield of new trees or fish, a flow that can be sustainable year after year”. Ecosystems are renewable natural capital that yield a flow of harvestable goods like wood and ecosystem services like erosion control and recreation and sustainability relies on renewable natural capital’s ability to produce ecosystem services and maintain itself (Costanza & Daly 1992).

Social capital is defined by Putnam (2000) as “connections among individuals—social networks and the norms reciprocity and trustworthiness” (p. 19). Social capital in a particular setting is both individual and collective. Specifically, individuals create connections that benefit their own interests, yet the costs and benefits of these connections can affect the greater community and social networks are an important component of social capital and are based on mutual obligations and reciprocity, knowing that actions to help

another will be returned over time (Putnam 2000). Like natural capital, social capital can depreciate over time if it is not maintained (Coleman 1990).

The theories of natural and social capital can be applied to the experience of Maasai pastoralists with the privatization of their collective land holdings and natural resources. For traditional Maasai pastoralism, natural capital consists of the physical landscape and the services necessary to maintain their livestock herding traditions. Social capital of the Maasai has consisted of traditional decision-making systems and reciprocal relations between individuals and communities that have helped to maintain the natural capital necessary to sustain traditional pastoralism.

## **Setting the Stage: Resource Management and Land Use and Tenure Change**

### Traditional Pastoralism and Land Tenure

Pastoralism “is a form of ‘extensive grazing’, meaning that use is made of land by grazing animals without an overall improvement of the vegetation being undertaken by (re)seeding or fertilizing or allowing for improvements like feedlots or water supplies” (Rutten 1992, p. 13). The utilization of these natural pastures for livestock husbandry is a result of people adapting to environmental conditions including climate, topography, vegetation, and disease sources as well as demographic factors like population density. Pastoralism is based on the ability to move livestock in search of pasture and water sources as well as steering clear of diseases and predators (Salzman, 2004). Rutten (1992) defined pastoralists as:

people who make a living by keeping livestock that act as a direct intermediate between man and his natural environment, the pastures. Indigestible plants are converted into milk, meat, fat and blood for human consumption and/or provide an indirect source of income through the sale or barter of animals and their produce, including wool, hides and skins, manure, and horns (p. 13).

For centuries in the semi-arid grasslands and woodlands of what is now southern Kenya and northern Tanzania, nomadic livestock herders like the Maasai have coexisted with vast populations of wildlife. Traditionally, the nomadic Maasai of Kenya relied primarily on cattle, goats, and sheep for their economic and social interactions. Berger (1993) explained that the care and use of livestock played a key role in the lives and culture of the Maasai communities where livestock ownership was required for community status and influenced their political structures. Even today the number of livestock one owns determines much of Maasai wealth. According to Rutten (1992) the Maasai were traditionally semi-nomadic and relied on cattle and the milk they produce for their subsistence needs.

Land tenure includes both formal and informal rights and obligations concerning individuals and groups and land and natural resources. Further:

These rights and obligations concern the acquisition, use, preservation and transfer of specific land or products of the land. Such rights may be disaggregated, so that rights of use, for example, may include cultivating annual or perennial crops, grazing, hunting, collecting fuelwood or water, transiting or building. Rights of transfer include sales, rentals, gifts, inheritance or mortgages (Haugerud 1989).

According to Seno & Shaw (2002) customary land tenure of the Maasai was based on communal ownership of the land where tribal elders controlled the use of the natural resources by manipulating grazing strategies.

They allowed grazing in specific areas during the dry season and other areas during the wet season. Certain areas were set aside for calves, sick animals, and small stock like goats and sheep (Galaty, 1992; Seno & Shaw, 2002). In southern Kenya, where rainfall is scarce and much of the landscape is considered arid and semi-arid, livestock herding is an efficient form of land use (Fratkin, 1994). Unlike agricultural peoples who do not migrate, livestock herders are able to adjust to the area's unpredictable rainfall patterns by migrating to seasonal grazing areas and water holes. To ensure continued production of forage for their livestock the traditional grazing strategies of the Maasai involved moving herds and people from dry-season grazing areas based at permanent water sources to temporary wet-season pastures near temporary water. Reliance on livestock allowed the Maasai to abstain from utilizing wildlife for subsistence. Wildlife consumption was considered taboo, except in times of food scarcity, usually during the dry season (Berger, 1993).

According to Mearns (1999) livestock presence on the rangelands of Africa can be beneficial to the landscape and wildlife populations. Some have credited the lack of conflict between Maasai livestock and wildlife to the traditional Maasai migration schemes and grazing strategies (Berger, 1993; Boyd, Blench, Bourn, Drake, & Stevenson, 1999; Okello, 2005). Traditional pastoralism, as a land use, is considered compatible with and complimentary to wildlife conservation (Mizutani, Muthiani, Kristjanson, & Recke, 2003; Wayumba & Mwenda, 2006). Specifically, according to Homewood & Rodgers (1984), in their study of the Ngorongoro Conservation Area, a Maasai

pastoralist/wildlife conservation area in Tanzania, traditional subsistence pastoralism, when carried out in conjunction with wildlife conservation, worked for the long-term benefit of both of these land uses. Gadd (2005) found that, when compared with farmers, livestock herders in the Laikipia District in central Kenya were more tolerant of wildlife.

Despite being a relatively efficient land use and compatible with wildlife conservation, the Maasai herding lifestyle, a vital component of Maasai culture for millennia, is threatened by many of the same changes to the landscape and concomitant losses in mobility that also affect migrating wildlife populations (Nightingale & Western, 2006; Reid et al., 2004; Seno & Shaw, 2002).

#### Colonial Land Policy and the Creation of Group ranches

Land tenure is defined by Haugerud (1989) as “both formal and informal rights and obligations associated with particular categories of individuals and groups in relations to land and its products” (p. 62).

These rights and obligations concern the acquisition, use, preservation and transfer of specific land or products of the land. Such rights may be disaggregated, so that rights of use, for example, may include cultivating annual or perennial crops, grazing, hunting, collecting fuelwood or water, transiting or building. Rights of transfer can include sales, rentals, gifts, inheritance or mortgages (p. 62).

In pre-colonial times, when the Maasai practiced nomadic pastoralism, the land and its resources were believed to be communal territory whereby reciprocal permission to enter another group’s area was always granted (Seno & Shaw, 2002). However, as the colonial control over land restricted access

to necessary pastoral resources, the traditional pattern of land use was altered. Furthermore, the creation of national parks and other protected areas by colonial governments and national governments and the resulting alienation from traditional grazing lands affected the ability of Maasai to move their livestock to adequate grazing and water supplies (Reid et al., 2004). The national government believed that settling the Maasai would encourage economic viability within the Maasai society; land tenure policies were initiated in order to advance this transformation (Seno & Shaw, 2002). These policies were based on the belief that communal ownership of rangelands resulted in overgrazing and inefficient use of resources, but the policies failed to acknowledge the traditional adaptations and management strategies of the Maasai (Galaty, 1992).

In 1968, through legislation, the national government of Kenya tried to dismantle traditional communal land holdings by establishing group ranches and assigning property rights to a set numbers of individuals (Mwangi, 2007a, 2007b; Ogolla & Mugabe, 1996; Serneels & Lambin, 2001). The group ranches were privately owned by a group of registered members and each group ranch was managed by committees elected from the membership (Galaty, 1980). By recognizing the property rights of Maasai communities and giving them title to their land, it was believed that incursions of other tribes into Maasailand would be prevented for the time being (Bekure & Ole Pasha, 1990; Galaty, 1992). Most Maasai supported this concept because they wanted exclusive grazing rights, to keep out other people, and prevent the

conversion of more land to becoming national parks and game reserves (Galaty, 1980). According to Galaty (1992), a less stated goal of group ranches was that their establishment was the first step by the government towards a complete privatization of these lands whereby land could eventually be bought and sold and made available to Kenya's ever growing population.

Since mismanagement of the land would negatively impact group ranch members, another goal of group ownership was to provide incentives to collectively and sustainably manage resources and obtain access to capital using land titles as collateral for loans (Bekure & Ole Pasha, 1990; Galaty, 1992). According to Rutten (1992) group ranches:

are a specific ranching system ... in which the exclusive grazing rights of a large tract of (unfenced) land are given to a specific group of families. Its objective lies somewhere in-between that of regular ranching (one of the most commercialized forms of livestock keeping oriented at an outside market), and that of subsistence pastoralism (foremost geared to maximize (milk) output in order to support the human population and the reproduction of the herd) (p. 474).

By the year 1979, fifty-seven group ranches had been established throughout Kenya's Maasailand (Mwangi, 2007a). The group ranches varied in size from 10-20,000 acres in the more populated, highly productive areas to up to 100-200,000 acres in the drier areas where fewer people lived (Galaty, 1992).

The establishment of Maasai group ranches has kept these lands in the hands of the Maasai and some Maasai have improved their livestock management with better access to water and veterinary services and by introducing larger, more productive livestock breeds (Bekure & Ole Pasha, 1990). But, the establishment of Maasai group ranches was inherently

problematic. The foremost problem with the group ranch system was that a private land tenure regime has been superimposed over a communal property rights regime meaning that people trying to live communally are confined to a particular area, thereby resulting in decreased access to land necessary for their own subsistence. According to Kimani & Pickard (1998), group ranches were faced with the difficult task of sustainably supporting a growing human population trying to maintain a traditional subsistence system in a restricted land area. But, problems existed within the group ranch management structure. Group ranch committees were supposed to represent the collective interests of the community. But internal and external pressures over control of the land and its resources were imposed on committee members and they lacked effective organization and failed to manage the group ranches in the way the government had intended. These committees failed to limit the numbers of livestock and never controlled grazing on the group ranches (Bekure & Ole Pasha, 1990).

In actuality, the group ranch system failed to accomplish its goal of settling Maasai within the boundaries of the group ranches because many Maasai “continued treating their land as pastoral commons with generally open access for all Maasai” (Seno & Shaw, 2002). During normal rainfall years, they tended to stay in the group ranches but in times of drought migrated to other group ranches in search of grazing resources (Bekure & Ole Pasha, 1990). By maintaining some aspects of their traditional migration schemes, despite the group ranch boundaries, the Maasai were able to

efficiently meet their subsistence needs (Kimani & Pickard, 1998). Within the Amboseli Ecosystem of southern Kenya, the semi-nomadic lifestyle of the Maasai after the establishment of group ranches assured open land for livestock and allowed for the movement and dispersal of wildlife (Wayumba & Mwenda, 2006).

### Group ranch Subdivision

As a consequence of the difficulties arising from the group ranch system, there was a drive towards individual private land tenure (Bekure & Ole Pasha, 1990; Mwangi, 2007a, 2007b; Okello, 2005). During the 1970s some of the group ranch members with seniority, influence, business acumen, and education were able to gain title to individual ranches taken from the group domain (Galaty, 1992). In the mid-1970s to the 1980s group ranch members in northeastern Kajiado district in southern Kenya began subdividing their ranches. The push for subdivision elsewhere in the district occurred between 1984 and 1996 (Mwangi, 2007a).

The internal support for subdivision was guided by the hope of securing individual property rights and also the dissatisfaction with the efficiency of the current group ranch management structure (Bekure & Ole Pasha, 1990). According to Mwangi (2007a), who researched the process of subdivision in four Maasai group ranches in southern Kenya, residents supported subdivision because they hoped to gain from the new property arrangements and reduce the unequal distribution of resources within the group ranch system. Active government policies and a presidential decree also encouraged group ranch

members to subdivide (Bekure & Ole Pasha, 1990; Galaty, 1992). According to Rutten (1992) support for group ranch subdivision was based on the concept:

that it would help self advancement and raise standards of living, boost the ability to procure a loan using the freehold title deed as collateral, minimize the exploitation of the poor by rich households, promote Maasai engagement in agricultural and industrial enterprises and facilitate better maintenance of the existing infrastructure (pp. 476-477).

### Predicted Consequences of Land Subdivision

The private land allocated to individuals was only going to be a fragment of what was previously available for livestock in a communal land tenure system, thus making it difficult for pastoralism to continue as a viable livelihood. Seno & Shaw (2002) expected that since individual ownership can restrict livestock movements and limit access to grazing resources, livestock production would decline. Boone, Burnsilver, Thornton, Worden, & Galvin (2005) modeled the potential effects of land subdivision on the capacity of individual ranches to support livestock. For less productive group ranches, livestock carrying capacity would be reduced by subdivision if livestock were limited only to individual ranches. The model predicted that by sharing access to pasture the effects of subdivision on livestock numbers could be reduced in some of the ranches. These findings suggest the relative benefits of maintaining open and flexible access to individually owned ranches after subdivision.

According to Bekure & Ole Pasha (1990) group ranch subdivision would change the way Maasai managed their livestock and grazing lands because

wealthy Maasai with large herds of livestock would need to rent or buy land or sell many of their animals. Those Maasai with fewer livestock could buy more livestock or lease or sell their lands and those who sell, either unwillingly or by default, could end up displaced and unemployed. The subdivision of group ranches raised the question of how communal resources will be shared in the future.

Thornton, Burnsilver, Boone, & Galvin (2006) modeled the potential effects of group ranch subdivision and land fragmentation on individual household livestock numbers and food security. The model predicted that a serious consequence of subdivision would be the loss of dry season grazing resources. This would cause substantial reductions in the number of livestock numbers and impact food security. Individual households would be forced to sell animals to generate income and they would need to diversify their livelihood strategies in order to sustain their well-being. While an increase in cultivated agriculture might be an option for some landowners who live in more productive areas, this would not be an option for many who live in drier, less productive rangeland areas.

Other potential problems with subdivision were the issues of inheritance, further marginalization of women, inequitable distribution of land, the permanent loss of land sold to land speculators during drought and other times of hardship, the in-migration of outsiders to Maasailand, and the loss of traditional leadership and lifestyles (Matampash, 1993; Seno & Shaw, 2002).

The prospect of subdivision of group ranches into individual plots is a dilemma for the Maasai. In their survey of Maasai group ranch members in the Maasai Mara region of southern Kenya, Seno & Shaw (2002) found that while most of the respondents favored subdivision for ensuring protection of their land from further alienation and as a means to facilitate development, over half of the respondents feared subdivision would result in the loss of grazing lands and/or that land parcels would be too small to support a livelihood.

According to Rutten (1992) the opposition by some Maasai to subdivision in Kajiado District in southern Kenya was based on claims that:

that the ultimate result would be the alienation of land to the non-Maasai, the creation of severe erosion in areas where cultivation was to start, the loss of Maasai culture and the restriction of the movement of wildlife and livestock to the detriment of the meat producing and tourist attracting functions of the district (p. 476).

Because land subdivision is a major change for the Maasai, Bekure and Ole Pasha (1990) suggested that if subdivision is to take place “it is essential that the government not impose a solution on the Maasai. It should take an active role in assisting them to work out new mechanisms that will lessen the pain of adjusting to the new land tenure transformation” (p. 248).

Some researchers warned that a transformation to individual land tenure could have a negative effect on wildlife as landowners sever migration corridors by building fences and otherwise developing their property (Okello, 2005; Okello & Kiringe, 2004; Seno & Shaw, 2002). Fragmentation could further isolate national parks and other protected areas by forcing wildlife to

spend more of their time in these areas (Okello & Kiringe, 2004). The elimination of resource sharing could lead to trespassing into these protected areas to obtain resources such as grazing land, water, and firewood, all of which could create conflict and have a negative effect on wildlife in Kenya (Okello & Kiringe, 2004; Seno & Shaw, 2002).

### Ecological Consequences of Subdivision and Fragmentation

Wayumba and Mwenda (2006) looked specifically at how subdivision and land use change in the Amboseli Ecosystem affected wildlife migration. They found that the increasing subsistence demands of a growing population combined with land subdivision in several Maasai Group ranches has interfered with wildlife migration routes and reduced the size of important wildlife dispersal areas. These changes are negatively affecting protected areas and the integrity of the Amboseli Ecosystem.

Worden (2007) quantified the effects of settlement and fragmentation in the Greater Amboseli Ecosystem on livestock production and wildlife conservation inside and outside protected areas. This fragmentation has fundamentally changed pastoral settlement and grazing patterns. Grazing patterns have shifted from a wet season to a dry season dispersal system because availability of forage resources has taken the place of the spatial distribution of water sources as the main constraint on pastoralism. Notably, livestock in areas with a high level of fragmentation were less mobile when rainfall patterns were normal. However, because of overgrazing and restricted access to local forage, livestock keepers in the fragmented areas, under

drought conditions, were forced to move their cattle earlier and farther than livestock in the less fragmented areas. Because of fragmentation livestock were not able to maximize access to green forage resources. With fragmentation, livestock use of forage resources intensified and as a result wildlife presence in these areas was reduced and the distribution of wildlife was affected by this intensity. Wildlife presence increased in protected areas but some species were absent due to changes in habitat caused by an increased presence of elephants in protected areas.

Groom (2007) looked at the ecological consequences of subdivision by comparing two different group ranches in southern Kenya, one that was subdivided and one that was not. Maasai living within the subdivided group ranch had stopped migrating and the amount of forage and local wildlife numbers there were significantly less than on the communally owned group ranch.

#### Consequences of Land Subdivision for Traditional Pastoralism

Few researchers have looked specifically at the response of Maasai livestock herders to subdivision and how the privatization of communally owned group ranches has affected the traditional natural resource management practices of Maasai livestock herders and their relationships with wildlife.

According to Mwangi (2007b) the process of subdivision in some group ranches was undermined by politics and procedural difficulties that resulted in unequal distribution of land among group ranch members. The instability of

individual land parcels made it difficult for individual landowners and required re-contracting of land parcels and in some instances the reaggregation of land parcels through pasture sharing and leasing agreements.

In some group ranches the subdivision of land has resulted in the sale of land to non-Maasai (Galaty, 1992; Kimani & Pickard, 1998; Rutten, 1992). Where the best land is being sold to outsiders, the Maasai are left with the less productive, drier lands and there is a lack of adequate dry season pasture (Kimani & Pickard, 1998; Rutten, 1992). While the fencing of individual ranches had not yet occurred among former group ranch members, the continued fencing of land by non-Maasai purchasers of land was threatening the mobility of Maasai livestock (Kimani & Pickard, 1998; Rutten, 1992). According to Rutten (1992) the Maasai were not fencing their plots because many of them were not accustomed to fencing, they could not afford it, and they realized that fencing their plots would hinder their ability to move livestock. Because of these difficulties some Maasai are seeking other ways of making a living including other occupations besides livestock herding like wage labor (Burnsilver & Mwangi, 2007; Rutten, 1992). Intensifying livestock production by improving livestock breeds was seen by some Maasai as a viable option but this was made difficult due to the scarcity and high cost of these new breeds and their vulnerability to drought and disease.

In response to the loss of mobility and flexibility caused by subdivision some livestock herders are sharing pastures and cooperating with each other to develop water sources, schools, and roads (Burnsilver & Mwangi, 2007).

These pasture sharing and swapping agreements were usually based on preexisting relationships with family and friends. According to Burnsilver & Mwangi (2007) these strategies to recreate “mobility and maintain flexibility in the face of subdivision may speak to the ability of Maasai pastoralists, as well as other pastoral groups, to adjust proactively to changing political and economic realities” (p. 35).

### Agricultural Development in Africa

All across the African continent livestock herders and wildlife are suffering as valuable grazing lands are developed for agriculture and protected areas become isolated fragments of habitat for remaining wildlife (Campbell, Gichohi, Mwangi, & Chege, 2000). No study about contemporary wildlife conservation and livestock herding in Kenya can ignore the phenomena of agricultural development and expansion.

As Kenya's economy follows the international trend towards a capitalistic system, and the population grows, development policies and the financial rewards of agriculture encourage increased cultivation in unprotected areas traditionally used for livestock and wildlife grazing (Campbell et al., 2000; Seno & Shaw, 2002). Maasailand has not been an exception and, consequently, many people have resorted to agriculture for subsistence and cash in these areas. Monetary returns are lower from traditional livestock herding than from agriculture. From an economic standpoint, agriculture has become an important income supplement for Maasai communities faced with the uncertainties and difficulties of pastoralism today (Okello, 2005).

Campbell et al. (2000) reported that in the southeast Kajiado district of Kenya, which included at that time Amboseli National Park and surrounding group ranches, conflict between livestock herding, farming, and wildlife over land water resources has gotten worse over the last 30 years. According to Okello (2005) current land use trends may soon lead to the exclusion of wildlife from Maasai group ranch lands in southern Kenya. With the creation of group ranches and group ranch subdivision, certain areas have been leased to non-Maasai farmers from other parts of East Africa (Okello, 2005).

According to Homewood (2004) rather than reducing environmental impacts, the policy of privatization of communal rangelands surrounding the Maasai Mara Game Reserve in southern Kenya has actually resulted in the destruction of land cover and declining wildlife populations as these lands have been replaced by commercial monoculture agriculture.

#### Rangeland Privatization Elsewhere in the Developing World

Rangeland privatization is a process that is affecting other pastoral communities elsewhere in the developing world including parts of Africa and Asia. Ning & Richard (1999) studied the process of land privatization and the impacts on pastoral dynamics in the rangelands of the Tibetan plateau in China. Like the creation of group ranches and privatization of land in Kenya, the Chinese government has attempted to settle nomadic pastoralists who had relied on migratory and deferred grazing practices for centuries. In the 1950s, herds were collectivized and, despite efforts of the Chinese government to settle the nomads, livestock herders were allowed to migrate to traditional

seasonal pastures. In the 1980s, as China moved towards a market oriented economy, livestock were once again the property of individual households. The privatization of grazing land through extended pasture leases of state owned rangelands began in the 1990s with the goals of intensifying livestock production and increasing livestock off-take and incomes. The program was expected to limit livestock numbers to the carrying capacity of individual land and improve rural infrastructure and marketing capabilities of livestock herders. Like the Maasai experience, the mobility and flexibility that the pastoralists had relied on for centuries was restricted. Agriculture is expanding into grazing lands and there is an increased risk of environmental degradation and loss of biodiversity. According to Zhaoli & Ning (2005), the advent of year round grazing in traditional seasonal pastures and fencing of rangelands following rangeland privatization in the Tibetan plateau has negatively affected wildlife habitat and migrations.

Despite efforts to reduce stocking rates and commercialize the herds on the Tibetan Plateau, production is still geared towards subsistence. Traditional social systems associated with nomadic pastoralism are threatened by these policies that focus only on pasture and livestock development and ignore the connections between culture and the land. Because of the high cost of acquiring sufficient grazing land, livestock ownership is being concentrated into wealthier households. Poorer livestock herders, unable to meet their needs through livestock, may have to find other employment. This may be difficult because they have little formal education and there is

competition from immigrants who are increasingly moving into the area. In some areas, groups of households are allowed to share their individual allotments with each other and manage their livestock and pastures together. Like the pastures agreements made by some Maasai after group ranch subdivision, these groups are often based on existing kinship ties (Ning & Richard, 1999).

According to Zhaoli, Ning, Dorji, & Jia (2005) this process of rangeland privatization in the Tibetan Plateau of China has resulted in an uneven distribution of resources due to the variability in productivity across the landscape. Because water resources are few and far between on the Tibetan Plateau, privatization has made it more difficult for some herders to access water. Specifically, many of the individual plots do not have water sources and it is difficult for them to obtain water from, and pass through, land owned by others. Conflicts can occur when water sources are located on individual fenced plots of land. Because fencing is expensive, many households have not fenced their individual plots of land and are sharing grazing land with each other. This sharing is based on traditional practices and is usually focused on managing individual pastures communally and negotiating grazing routes and timing. However, in cases where fencing has occurred this has created conflicts because livestock mobility is restricted to narrow paths that do not have sufficient grazing resources for livestock moving between pastures. Privatization has scattered people across the landscape and made it more difficult for some local people to access social and economic services and

livestock theft has increased. Before privatization many households lived and migrated together and were able to better defend their herds from theft.

In many locations, infrastructure development has been slow to keep up with the needs created by rangeland privatization. Privatization requires more labor inputs including guarding boundaries and negotiating with others for water and pasture access and this burden often falls on women and children (Zhaoli et al., 2005).

According to Williams (1996) rangeland privatization in the Inner Mongolia Autonomous Region of Northern China was promoted to maximize livestock production and control the desertification of grasslands. In actuality, these policies have had negative effects on the environment and compounded grazing problems for many livestock herders. The intensification of livestock production has led to overstocking individual plots of land resulting in increased wind and soil erosion over large areas. While privatization can provide herders with secure land tenure, better access to community resources, and access to government support including legal protection, production services, and credit, it has not resulted in sustainable pastoral production.

According to Kisamba-Mugerwa, Pender, & Edward (2006), the individualization and privatization of rangelands in Southwestern Uganda has led to greater investment in rangeland management. Investments include pasture improvements, brush clearing, planting multipurpose trees, intensified livestock production (by crossbreeding local livestock breeds with more

productive exotic breeds), and using fenced paddocks. Nevertheless, this privatization has not reduced herd sizes and not limited land degradation. In some areas conflicts have resulted over land ownership and use. Although privatization has increased income and wealth for some livestock herders, the loss of customary communal land tenure has made them more susceptible to risks like drought.

### Wildlife Conservation and Tourism

Kenya is home to an abundance of wildlife including many species of large herbivores and carnivores. Many species are unique and endangered and are the cornerstone of Kenya's tourism sector. Kenya has a system of government-controlled national parks and reserves where wildlife habitat is preserved for aesthetic, scientific, and cultural purposes (Akama, 1998). Many of these parks are treated as "wilderness areas". According to Homewood (2004) this "fortress conservation" excludes residence and consumptive use of resources by local people.

Some have argued that these protected areas are limited in their effectiveness for maintaining biodiversity (Akama, 1998; Homewood, 2004; Western, 1989; Western et al., 2006; Wishitemi & Okello, 2003) as the survival of wildlife depends on migration corridors and dispersal areas outside of parks and reserves (Akama, 1998; Ogolla & Mugabe, 1996; Western et al., 2006). Akama (1998) suggested that not only has the park and reserve system, initiated by the British during colonialism and carried through independence, failed to adequately protect the country's wildlife, it has alienated local people

by shifting the benefits and user-rights of wildlife away from rural peasants and pastoralists and placed them under the increasing control of the government, conservation organizations, and tourism groups. The arrival of Europeans to Eastern Africa forever changed the relationship between indigenous Africans and wildlife. Kenya's wildlife conservation strategies "do not correspond with the socio-economic, cultural, political, and ecological realities of the regions where the parks are situated" and "most park managers are narrowly pre-occupied with protecting park fauna instead of with conserving whole ecosystems of the park and the surrounding areas as healthy, self-sustaining ecological units" (Akama 1998, p. 6). Much of the wildlife tourism in Kenya has taken place in national parks and reserves and benefits do not reach the local people (Akama, 1998; Sindiga, 1999).

Land outside of nationally protected areas continues to play a major role in the future of wildlife conservation. Western et al. (2006) reported that 65% of Kenya's highly mobile wildlife population is found outside of national parks and reserves. Based on a comprehensive survey of wildlife populations in Kenya gathered from a variety of sources, the authors further stressed that ignoring habitats outside of national parks will result in continued population declines within the parks.

Extensive research exists about the threats to wildlife conservation in East Africa. These threats include accelerated destruction of habitat on private lands important for wildlife caused in part by agricultural development, changes in land tenure, and alienation of local people and the lack of socio-

economic incentives that promote conservation (Akama, 1998; Brady & Weil, 1999; Homewood, Lambin, Coast, Kariuki, Kikula, Kivelia, Said, Serneels, & Thompson, 2001; Homewood, 2004; Okello, 2003; Okello, 2005; Okello & Kiringe, 2004; Reid et al., 2004; Seno & Shaw, 2002; Wishitemi & Okello, 2003). Wildlife numbers continue to decline (Western et al., 2006) and human-wildlife conflict continues (Akama, 1998; Damiba & Ables, 1994; Okello, 2005) while local people remain suspicious and hostile towards government policies and wildlife conservation programs (Akama, 1998).

Still, there is hope for wildlife conservation in Kenya. Western et al. (2006) report that over the last 15 years, private and community conservation initiatives, many of which are the result of new economic incentives and encouragement from the Kenya Wildlife Service (KWS) and other conservation interests, have taken a greater role in protecting Kenya's wildlife. Today, these private conservation areas support 40% of the country's wildlife and compliment conservation efforts in national parks and reserves.

### **Changing the Status Quo: New Ideas for Conservation and Natural Resource Management**

#### Community-Based Conservation

Because the status quo fails to adequately protect wildlife, many argue that wildlife conservation and natural resource management in Africa must shift from top-down protectionist strategies to community-based conservation (CBC) or community-based natural resource management (CBNRM) (Akama, 1999; Okello, 2005; Seno & Shaw, 2002; Western, 1989, 1994). Examples in

the literature of CBC initiatives promoted as solutions for wildlife and development problems in the semi-arid parts of Africa like southern Kenya include ecotourism development (Akama, 1997; Goodman, 2002; Honey, 1999; Sindiga, 1999) and integrating wildlife conservation with livestock production (Boyd et al., 1999; Doetinchem & Crepin, n.d.; Flyman, 2003; Mearns, 1996; Ashley & Elliot, 2003; Mizutani, Muthiani, Kristjanson, & Recke, 2005).

These strategies can involve local people in wildlife management and provide a more equitable distribution of costs and benefits of wildlife conservation. Western (1989) suggested that wildlife conservation “beyond the parks can only succeed by adapting philosophy and methodology to local conditions, whether cultural, economic, religious, or political” (p. 165). This is especially apparent on Maasai group ranches in southern Kenya where the survival of wildlife depends on migration corridors and dispersal areas outside of traditionally protected areas in Kenya (Ogolla & Mugabe, 1996; Akama, 1999; Wishitemi & Okello, 2003). Successful biodiversity conservation in southern Kenya requires looking beyond national parks and involving local human communities in ways that integrate conservation with local expertise, needs, and development. Otherwise, fragmentation of the landscape will continue to occur and the current network of parks and protected areas will not be able to adequately maintain healthy wildlife populations (Wishitem & Okello, 2003).

Hackel (1998) noted that community-based conservation is a positive shift away from past practices that ignored local people, population growth, and widespread poverty. But, important questions remain about the ability of community-based conservation to be successful in Africa. The difficulty in administering CBC programs is further complicated when the goal is to combine wildlife conservation with social and economic development. The uncertainty of financial gain from CBC makes it hard to keep people from turning to other, less conservation oriented economic alternatives like agriculture. Successful CBC requires an integration of environmental education, local people's involvement in management, regulated access to protected lands, compensation for protecting biodiversity, and compensation from such activities as hunting and tourism. Research suggests that if tangible benefits of wildlife conservation can reach local people, and the connections between wildlife conservation and these benefits are clear, local people are more likely to view wildlife positively and support conservation efforts (Gadd, 2005).

Obstacles to successful CBC in rural landscapes include breakdown of traditional societies, globalization, population and commercial pressures, nepotism, corruption, and lack of awareness, skills, and enforcement (Western, 1994). The research of Kellert, Mehta, Ebbin, & Lichtenfeld (2000) demonstrated this in southern Kenya, where the lack of effective local institutions and lack of education limited the effectiveness of a community-based effort to conserve wildlife resources and harness the benefits of tourism

for the local Maasai community. The result was a highly uneven distribution of benefits, accusations of corruption, little or no transfer of management authority to local interests, and limited effectiveness for conserving wildlife and regulating the actions of local people.

Goldman (2003) examined community-based wildlife conservation projects in northern Tanzania meant to involve Maasai communities in conservation planning and transfer authority over wildlife to local communities. NGOs, donor agencies, and government authorities claimed to be engaging communities in conservation, but in actuality “conservation planning in Tanzania remains a top-down endeavor, with communities and their specialized socio-ecological knowledge delegated to the margins” (p. 833).

True community-based conservation needs to better reflect the needs of local communities, their knowledge, and complex social and ecological structures (Goldman, 2003). For the Maasai, this means focusing on efforts that better incorporate traditional Maasai geography, ecological knowledge, and resource-management processes. Additionally, conservation planning that demarcates certain areas into protected and unprotected zones should be discouraged and replaced by flexible management strategies that better reflect the migratory behavior of wildlife and the needs of the Maasai livestock.

### Ecotourism

Ecotourism has been promoted “as a way to provide resources to help protect wildlife and fragile ecosystems, a development tool for rural communities living around parks and other protected areas, and a greener,

cleaner alternative to the ills of conventional mass tourism” (Honey, 1999, p. 9). Sindiga (1999) looked at alternative tourism in Kenya and the prospects of ecotourism for providing sustainable development. Close evaluation of community participation in ecotourism, government policies on ecotourism, and other efforts to promote ecotourism, revealed that ecotourism in Kenya was still dominated by multinational tourism companies. Small scale, locally owned businesses did not realize any substantial benefits. Even so, there is unrealized potential for tourism to have a positive impact on conservation and local development projects.

For pastoral communities like the Maasai, community-based ecotourism can provide an alternative livelihood strategy by shifting management responsibilities and benefits of wildlife to the locals (Goldman, 2002). However, the Maasai remain interested in livestock and therefore need the freedom to choose how to integrate community-based wildlife tourism with traditional livestock herding.

#### Wildlife-Livestock Integration

There is growing support for integrating wildlife conservation with livestock production as a solution for wildlife and development problems in the semi-arid parts of Africa (Boyd et al., 1999; Doetinchem, & Crepin, n.d.; Flyman, 2003; Mearns, 1996; Ashley & Elliot, 2003; Mizutani et al., 2003). In areas where agriculture is an unsustainable land use, pastoralism and other compatible land uses should be promoted through holistic land-use planning

and financial incentives in order to protect valuable wildlife habitat (Gadd, 2005).

This is especially true for southern Kenya, where wildlife and the pastoral life of Maasai livestock herders remain threatened by changes in land tenure and agricultural development (Nightingale & Western, 2006). There is evidence to suggest that the promotion of mixed wildlife/livestock systems can improve the incomes of poor herders while maintaining biodiversity and healthy ecosystems (Mizutani et al., 2003). Boyd et al. (1999) suggested that a carefully planned and successful integration of wildlife and livestock economies might be enough to slow down the future spread of agricultural development into wildlife and pastoral areas.

## CHAPTER THREE – Methods

The following chapter includes a discussion of qualitative and case study research methodologies and how I collected and analyzed data for this study.

### **Qualitative Methodologies**

A major benefit of qualitative research is the ability to examine phenomena that may be difficult to convey using quantitative methods (Strauss & Corbin, 1998). Strauss & Corbin (1998) define phenomena as “a problem, an issue, an event, or a happening that is defined as being significant” by respondents in a study (p. 103). According to Berg (2004), qualitative researchers seek “answers to questions by examining various social settings and the individuals who inhabit these settings” and “are most interested in how humans arrange themselves and their settings and how inhabitants of these settings make sense of their surroundings through symbols, rituals, social structures, social roles, and so forth” (p. 7). Qualitative research, with its flexibility and greater attention paid to context, allows researchers to better understand the social and historical dimensions of natural resource management in ways that quantitative studies often don’t (Sayre, 2004). Qualitative research methods have been used by other researchers to gain a deeper understanding of land use changes and practices in other natural resource dependent communities (Theobald, Gosnell, & Riebsame, 1996; Yung & Belsky, 2007).

## **Case Study Research**

In this study I used a case study approach. Case studies allow researchers to investigate a phenomenon in its real-life context (Yin, 2003). According to Robson (1993) the “case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence” (p. 5). Case study methodologies are “used in many situations to contribute to our knowledge of individual, group, organizational, social, political, and related phenomena” (Yin, 2003, p. 1). By triangulating multiple sources of information case studies develop “converging lines of inquiry” and thus strengthen the accuracy of findings or conclusions (Yin, 2003).

## **Study Area**

For this study I focused on Mailua Group Ranch in southern Kenya located along the border with Tanzania (see Figures 1 and 2). This area is predominantly arid and semi-arid with grasslands, shrublands, and savannah woodlands that support an abundance of wildlife species and domestic livestock. In a typical year, the rainfall pattern is bi-modal with the long rains occurring from March to May and the short rains from October to December.

Mailua Group Ranch is located in Kajiado District and consists of approximately 110,000 ha. Prior to subdivision its membership had grown to approximately 1,200 registered group ranch members. In this area livestock herding is the dominant land use. The group ranch lies west of Amboseli National Park. The group ranch is undergoing complete subdivision, giving

each of its members approximately 150 acres of grazing land and five acres of irrigated land for cultivation. The border town of Namanga is located within the boundaries of the group ranch and the main road that connects Nairobi with Arusha, Tanzania passes through the group ranch.



FIGURE 1: Map of Kenya (approximate study area in red)

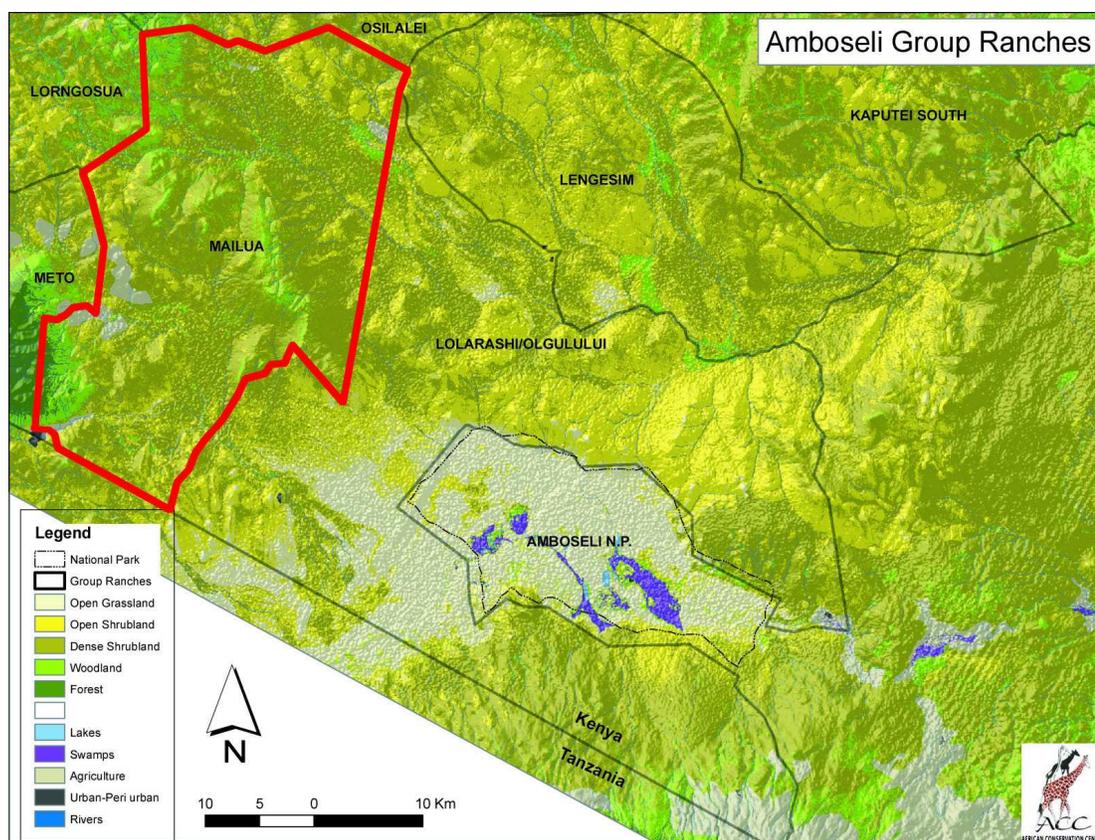


FIGURE 2: Map of Study Area Group Ranch (study area in red)

## Data Collection

Data in this study was collected through semi-structured interviews guided by a series of open-ended questions (see Appendix A) with group ranch members purposely selected from both group ranches. The questions for the interview were developed after an initial visit to the study area and discussions with key informants. Supplemental sources of data included informal discussions with key informants, direct observations, and participant observation. The unit of analysis for this case study is the community of Maasai livestock herders who reside within the borders of the subdivided

Mailua Group Ranch; individuals who participated in the semi-structured interviews are sub-units (Yin, 2003).

### Semi-structured Interviews

The semi-structured interview approach and the open-ended nature of the questions allowed me to guide the interview and keep the discussion focused on relevant topics while still allowing other topics to arise during the interview (Robson, 2003). Semi-structured interviews have been used successfully to collect information about natural resource-dependent communities (Bliss & Martin, 1989; Fernandez-Gimenez, 1993, 2000; Yung & Belsky, 2007). For my interviews I had a list of questions I intended to ask each study participant. In practice, this list was used to guide the conversation and other topics were allowed to come up that were not covered by the initial list of questions.

Purposive sampling allows the researcher to select participants based on their relevance to the phenomena being studied (Berg, 2004). In this case only adult men were chosen to participate because they are the ones who traditionally make livestock herding and land use decisions in these communities. As much as possible I selected participants from across the group ranches in order to fully understand the range of experiences in the community. Criteria for the selection of community members were based on place of residence and livestock herding experience. Participants ranged in age from 26-68 and many of them held other jobs besides livestock herding at one point in their lives (see Tables 1 and 2).

I conducted the interviews with the help of a local research assistant and translator who was fluent in all local languages. I conducted each interview in English or in the traditional language of the Maasai, depending on what was most comfortable for the participant. Interviews usually took place at the home of the participant(s) or traditional gathering places like market centers or livestock watering locations. In several cases, in the interest of being inclusive of a diverse group of participants in a particular location, I conducted interviews with more than one participant at a time. In this way I allowed for each participant to respond within the context of the group discussion. I interviewed 18 participants for a total of 12 digitally recorded interviews (see Tables 1 and 2).

Table 1: Individual Interview Profiles

Interview Number	Age	Occupation(s)	Education Level
1	50	Retired School Teacher, Livestock Herder, Missionary	Secondary, Teaching School
2	30+	Livestock Herder	Unknown
3	56	Retired School Teacher, Livestock Herder	Secondary, Teaching School
4	45	Livestock Herder	Unknown
5	60	Retired Hotel Manager, Livestock Herder	Secondary
6	42	Farmer, Livestock Herder, Retired Military, Retired County Councilor, Shopkeeper	Secondary
7	Unknown	Farmer, Livestock Herder	Unknown

Table 2: Group Interview Profiles

Group Interview Number	Number of Participants	Age	Occupation(s)	Education Level
1	2	46	Livestock Herder	Unknown
		Unknown	Livestock Herder	Unknown
2	2	26	Livestock Herder, Borehole Operator	Unknown
		30	Livestock Herder, Borehole Operator	Unknown
3	2	39	Livestock Herder	Primary
		35	Livestock Herder	None
4	3	68	Livestock Herder	Primary
		50	Livestock Herder	Unknown
		Unknown	Livestock Herder	Unknown
5	2	50	Livestock Herder, Farmer	None
		40	Livestock Herder, Farmer	Primary

Using translators can introduce bias as translators bring their own meanings and values to a project and valuable insights may be lost when translated into another language (Temple & Young, 2004). The act of translation can be a form of analysis or interpretation, as a translator assumes the role of both cultural broker and analyst (Temple & Young, 2004). Further, “without talking to interpreters about their views on the issues being discussed the researcher will not be able to begin to allow for differences in understandings of words, concepts, and worldviews across languages” (Temple & Young, 2004, p. 171). There is the potential for loss of valuable information which can be minimized by having both a local translator familiar with the research question and the researcher present during the time of the interview (Esposito, 2001). I minimized the chance bias and ensured accuracy

of translation and analysis by fully relying on a local translator familiar with the area, the study, and all relevant languages.

### Observational Data Collection and Key Informants

Yin (2003) emphasized the value of complementing data collected through formal avenues like interviews with less formal direct field observations. While traveling around the study area and interviewing group ranch members, I made observations about wildlife and Maasai herding practices, conservation measures, and other relevant information. Additionally, throughout my time in Kenya I engaged in several conversations with key informants about my project. Key informants included government officials, conservation NGO employees, other researchers, Maasai from other parts of Kenya, and people working in the tourism sector.

Using participant observation, a researcher can “become immersed in a setting, its people, and the research questions” (Glesne & Peskin, 1992, p. 54). While in Kenya, both in the field and while working at the African Conservation Centre in Nairobi, I participated in a number of meetings and gatherings with researchers, community members, and other key informants who were actively involved with developing and implementing community-based conservation, development, and tourism projects in Kenya. This experience provided me with an opportunity to gain a greater understanding of conservation and development in my study area. I kept track of my direct field and participant observations and discussions with key informants through field notes and photographs.

## Data Analysis

Qualitative research, because of its flexibility, allows for some degree of analysis to begin during data collection. According to Crabtree & Miller (1992) data analysis can begin:

shortly after the first data are collected. This analysis creates new understandings, generates changes in the research question, and uncovers new anomalies. The result is often a change of sampling strategy, new collection tools, and thus changes in analysis style. This recursive cycle continues until understanding is complete enough and/or no disconfirming data are discovered (p. 21).

An early analysis approach allows the researcher to make adjustments and explore new topics during the data collection period. It also allows the researcher to recognize when little or no new information is found. This is called saturation (Glaser & Strauss, 1967). In order to make adjustments and know when data collection was complete, I took notes following each field session and discussed my impressions with my research assistant and other key informants and researchers. This immediate examination allowed me to incorporate emerging topics during subsequent interviews and member check some of my preliminary findings.

Once the interviews were completed, I transcribed them into word processing files and, along with other observations and discussions in my field notes, I analyzed the data for patterns, common themes, and other relevant information. Using qualitative data analysis software I began my open coding by reading through every interview transcript and assigning passages to categories that emerged during this process. Because certain passages often covered more than one topic, some passages were assigned to multiple

categories. I assigned labels (codes) to the categories using words or phrases that describe the category. In some cases, I created sub-categories for better specificity.

Once coding was completed, I created a list of all of the codes and assigned relevant codes to broad categories reflecting the objectives of the study. At this stage I began interpreting the data by summarizing the information within each code and relating my summaries to each of the broad categories reflecting the objectives of the study. I documented my progress with memos and summaries of my interpretations. To make sure my interpretations were consistent with the data, I constantly compared my interpretations with all of the passages in a particular code or category.

Finally, I triangulated these results with my observations and initial impressions made in my field notes. In the final stage of my analysis I constructed a narrative of the findings based on my interpretations. In the narrative I highlighted certain important points by using quotes from the interviews and key informant discussions and observations from my field notes. Some of the quotes used in Chapter Four have been altered slightly to make them easier to read without changing the overall meaning.

### **Limitations of the Study**

A limitation of this study is that women were not included. It is unknown whether women would have different experiences than men. While men control much of the livestock decisions and maintain ownership of livestock, women in this community milk cattle and utilize donkeys for transportation of

fuelwood and water for domestic purposes. Interviewing women may have provided additional information regarding the effects of subdivision on livestock management and transportation as well the collection and sale of milk products derived from livestock.

## CHAPTER FOUR – Results

This chapter presents the results of this study in a narrative and is organized based on the study objectives and other information pertaining to the effects of subdivision on natural resource management and future conservation and development opportunities.

### **Livestock Herding and Maasai Traditions Prior to Subdivision**

For the Maasai of Maliua livestock herding has always been central to their culture, providing much of the household and monetary needs in the community. While it is cattle that are most revered by the Maasai, Maasai in this area have traditionally kept multiple species of livestock, specifically cattle, goats, and sheep, as well as donkeys for transportation. According to one local Maasai elder, “the Maasai and domestic animals are always one, they are two inseparable things, Maasai believes in an animal, domestic animals, if you don’t have an animal, a cow or a goat, you are not taken as a man of any value, where our traditions are concerned” (Individual Interview #3). Even for those Maasai men who held jobs elsewhere, livestock herding at home remained an important part of their life.

### **Communal Living and Sharing**

The Maasai have a strong tradition of sharing. According to one study participant:

In Maasai tradition the grass are shared, even the food like the tea that you have taken, and if I don’t have a cow to milk, the other Maasai can give me .... And we share water, our tradition is sharing, communal.

And the Maasai has a tradition of why they share their things. Because they say today you have, tomorrow the other one has. So you must share today because maybe you have today, tomorrow you don't have and you will need from another person. Today you have, tomorrow you don't have (Group Interview #3).

Individual Maasai families lived in traditional bomas consisting of homes with holding pens for livestock. Even after the establishment of the Group ranch, grazing land was shared and many households lived together in large communal villages called Manyattas, sometimes consisting of 10 to 15 families where they shared the responsibility of looking after livestock and each other. For example, "before the land was subdivided ... there were five bomas here, in each piece of land, but in that time, we could have been living in one ... big manyatta, so all those cows could have been together, so we move together" (Group Interview #2).

Because multiple families were living together it was easy for people to help each other and share resources, especially in times of need. Even the responsibility of raising children was shared among families living together. For example:

Before ... the Maasai say let us subdivide like other tribes, before subdivision, there was community sharing .... Before they subdivide people were living in a community and ... for example, one man ... in that boma he will use all the children... If it is one man who is at home and another man's children have a problem, he can even slaughter his cow for them, and when the father of the child comes back, he will say thank you. ... At that time a child belongs to the community, and a cow belongs to the community, and when for example, when I need food I can go to the livestock of this man, ... a friend. I'll just slaughter his goat and I will tell his wife, you just tell, the wife, and she tells the owner of the goat you have slaughtered his goat because we are hungry, he will say there is no problem (Group Interview #3).

## Natural Resource Management and Livestock Herding

By all accounts there was much freedom of movement for livestock within this system and nobody could claim ownership over any particular plot of land and there was almost no limit to the number of livestock an individual could own. As one Maasai livestock herder put it, “there was a free range system, the land was big for grazing, because there was not anybody who can claim this is their land, so I can graze anywhere I want” (Group Interview #2).

Without permanent homes, they lived a semi-nomadic lifestyle.

There before we were not settled. We moved up and down, we have no settlement, we live here, ... so we were nomadic, so we just move up and down, because we have no ... land that you can make permanent, there were no permanent areas (Individual Interview #1).

There was much mobility and livestock herders could move their cattle during different times of the year to find grass and water for their livestock.

Livestock herders could follow the rain to find fresh forage for their livestock.

Yeah, because before the group ranch was subdivided it used to be good, because you just graze as you want, and you see that there is no grass in here, you move, to another location. And then you get more grass, if you get rain there, you move.

Before demarcation, we used to stay where there is water, maybe a place where there is a water source very near, so people live there, together, and if it becomes the dry season, you have to migrate because of your animals, even if the grass is very far, you have to go there, even if water is very far, you have to go there, so nobody tells you to go there, you will just be shown, the place, by nature (Individual Interview #6).

Even though there was much freedom of movement before subdivision, elders within the community maintained some control over livestock grazing through a system of reserves designated for use during different seasons.

More specifically, bomas were put together in a line and grazing was controlled to ensure enough grass was available during the different seasons. With direction from the elders, special areas called Olipololi in the Maasai language were set aside for dry season grazing. When the rains stopped and there was not enough grass in the wet season grazing areas the elders decided it was time to open up the dry season reserves for grazing. Specifically, “before subdivision we used to stay in one place, we agree together we stay here, and there is a land which we reserve and in dry season we all agree to move to that area, we graze there until the rainy season and then we come back, so we used to live like that” (Individual Interview #6).

Not only were areas set aside for use during the different seasons, but also certain areas were set aside for different species and age classes of livestock.

There before subdivision, the Maasais were having a plan of grazing areas, even they can make it to three divisions, they can decide this area from here over ... is for calves only, and this side for big cows, this side for goats, they know how the calves are so slow ..., big animals can go farther than calves, goats they like bush, not grass, they divide the land like that, they have that division of land, this is place is for calves, this one is for big cows, so now at the time, that communal time, they live in a big land that they can graze calves, and if you try to bring your cows, you will get fined (usually livestock) or you will get removed from that area (Individual Interview #1).

Community members agreed to follow the rules set by elders.

According to one study participant, before subdivision “no individual could just organize himself and move alone, that time ... the community, if this community has a problem, they move all together” (Individual Interview #7).

According to one Maasai farmer and livestock herder, “there used to be a

traditional kind of law, ... where all of us have to live on this side, and then all bomas have to be here and then the animals, they graze this way, ... and then when it rains, they will return again this way” (Individual Interview #5).

Because of this system it was easier for livestock herders to survive normal wet and dry season intervals. This system, combined with large tracts of open land, helped alleviate the effects of drought on livestock. According to livestock herder interviewed in this study, when he was younger, before subdivision, “there were reserve places for cattle and the land was broad, so the drought didn’t affect us mostly because the land was broad and the cattle had enough grazing land and in case of drought ... the cattle still had grass” (Individual Interview #4).

When there were large, open, communally owned tracts of land free of settlement, groups of elders made most of the decisions regarding access to grazing resources and movements of livestock. It was possible to share grazing lands during times of need with adjacent group ranches in Kenya and Maasai communities across the border in Tanzania.

#### Environmental Impacts and Wildlife Interaction

Because land and resources were owned communally and households were grouped together, there were large tracts of land left unused during certain times of the year that resulted in only limited impacts on valuable forest resources. An added benefit was limited interaction and conflict with wildlife in important wildlife migratory corridors.

Before subdivision we Maasai were living in one communal boma, a big one, so there were not many bomas inside the bush, so the wild animals stayed there, ... so the interaction between us and wild animals was good because wild animals had a place to graze (Group Interview #2).

Maasai in this area have traditionally shared the land with wildlife and only killed animals when required to defend their livestock.

We have always been living together with animals, for years and years, we came around, there were several kinds of animals around this area, there were so many rhinos, elephants, lions, these wild animals, the Maasai have always been living with these animals, although, these animals are dangerous to livestock, we have been killing them for defense, not for any financial gain (Individual Interview #3).

### **History of Mailua Group Ranch Subdivision**

The phenomenon of subdivision is not new to the Maasai of Mailua Group Ranch. According to some of the older members of the community, before the Kenyan government began creating group ranches in there was strong resistance to efforts to privatize land. Nonetheless, some Maasai embraced the concept of private ownership and acquired title to large tracts of land, sometimes hundreds or even thousands of acres. These early landowners benefited from private ownership by getting loans from the government using their land as collateral and were able to acquire hundreds of livestock.

During that time, our fathers, they didn't want the land to be subdivided but other people who are enlightened at that time, they go secretly and they started demarcating the land without the know how of the other people. So those people ... took those big ranches and we thought that subdivision would never work in Maasailand, so we waited. And that time when those people got title deeds, when we were waiting to see what happened next, the drought struck. Many people, those people who had their own land, who owned the big ranches, their cattle didn't

die unlike those who had the free land. Because they took those title deeds to the government and they used them to get AFC (Agricultural Finance Corporation) loans, and they were given a lot of money even up to 300 cows (Group Interview #1).

Those who did not acquire private land became members of Mailua Group Ranch and continued to share the remaining lands. One elder interviewed for this study, said this early subdivision was stopped and it was decided that the “remaining land was going to be designated as a group ranch, and whoever now had not gotten individual land was designated as a member of the group ranch, and that we continued like that until recently when we came to say the group ranch has to be subdivided again” (Individual Interview #5).

According to several community members interviewed for this study, over time, group ranch members saw the benefits of owning individual pieces of land including secure land tenure, controlling one’s own affairs, and using land titles to obtain loans and a decision was made around 1990 to subdivide the entire group ranch.

When we see those people have benefited from their title deeds that is when all people, all community they saw subdivision has its benefits, so we decided for the land to be subdivided, that brought about the subdivision of our land. So when another group started trying to defeat the subdivision, the whole community refused. They said there must be subdivision, because they have seen the benefits which those people, because of the people who have got the benefits of the loans and others have not, and that is how the ranch was subdivided (Group Interview # 1).

While many in the community looked forward to the benefits of subdivision some community members interviewed for this study said they have always had reservations about subdivision and the effects it might have on livestock herding and access to natural resources. According to one local

elder, “So I see that I was not expecting something good” (Group Interview #3).

With this latest round of subdivision and the dissolution of the group ranch, the remaining communal lands are being subdivided into privately owned ranches for livestock grazing and smaller irrigated farms. The plan is for every former member of the group ranch to have a larger 150 acre ranch and a smaller five acre farm, both locally referred to as shambas. The smaller farms are intended for cultivation and are located at the base of the mountains in the western part of what used to be the group ranch. This is where perennial water sources flowing from the mountains can be used for irrigation. In some cases, people living in particular parts of the group ranch before subdivision did not have to move and they were able to obtain ownership to their occupied lands.

According to one livestock herder (Group Interview #1), the process of land subdivision has often been unequal because committee members and their friends were given larger parcels of land. As people complained, adjustments were made.

The process of surveying and demarcating individual plots of land is very expensive and time consuming and it was not completed during the time I conducted fieldwork for this study. Not all group ranch members have been given title deeds to their land and others are still waiting to be shown their pieces of land. One elder familiar with the subdivision process said,

Yeah, there are some who are members of Mailua Group Ranch who have not been shown their share of land but they are living with

brothers because not all of Mailua has gotten titles, subdivision is still going on, and everybody is going to his or her share, that has not been fully done, so we are actually looking forward to seeing when the land will be properly demarcated, then think of how he or she is going to work for their livelihood (Individual Interview #3).

During this process, certain parts of the group ranch have been reserved for the development of public water sources, roadways, and schools. Individual households now occupy individually owned and managed ranches and some people are building permanent homes and cultivating crops in the smaller farms. Many landowners now benefit from secure land tenure, knowing that the land is theirs and can not be taken from them. According to one landowner, "So now we were given our own ranches to development on our own, you see, but now you can say this is my land" (Individual Interview #1). According to another livestock herder, with subdivision families are able to build permanent homes and it is easier to access to school and healthcare for Maasai children and families.

We did not have before subdivision, ... we have seen that now, because we have towns, ... we have dispensaries .... So in like the area I am we are very close to town, my children can walk to school, very closely, and that is one of the developments I have seen that, if I could not be settled I could not be able to reach that school in a very simple way and help my children go to school in a very close place. So those are the things we have seen, we have developed, because now our children are learning, and we could not make it there before because we don't settle (Individual Interview #1).

According to one local elder, subdivision has made it easier to access people for administrative purposes including managing livestock disease outbreaks.

Right now, subdivision, we are now managing our own affairs, that is one factor, second, people have grown in number so the population is

right now, for any practical administrative purposes, subdivision it is easier to handle things like say there is an outbreak of foot and mouth around this end we from here can easily handle our situation, counting bomas, talking to elders, we sit down talk over that, whatever we want to do as our own selves then we can talk to the administrators (Individual Interview #3).

There is one advantage we have, if for example, there is an outbreak of disease, we see everybody is in his compound, so the cows will not meet, and spread the disease, so we see that also, land subdivision has brought that advantage (Group Interview #5).

Despite the aforementioned benefits the subdivision of Mailua Group Ranch has altered the physical landscape and the social systems of Maasai livestock herders. Based on the claims and practices of Maasai livestock herders, the ongoing privatization and subdivision of Mailua Group ranch in southern Kenya within the last twenty years or so has brought many changes to the community and affected traditional livestock herding practices in many ways. According to one local Maasai elder, the “question of land demarcation is a major change, different from what we learned from our forefathers; in fact this question of demarcating land is actually very different from our former system of keeping animals, the way we kept cattle before” (Individual Interview #3). However, even with all of the difficulties brought on by subdivision, many Maasai are accepting of the change. According to one Maasai livestock herder, “We decided all, nobody disagreed with land subdivision, so it is something, it is a change whose time has come” (Individual Interview #7) Another livestock herder told me subdivision “is something I don’t regret because what I have today is more blessed than, you know?” (Individual Interview #5).

## **Research Objective One – Subdivision Effects on Livestock Management and Responses to Seasonal Constraints**

### Loss of Traditional Grazing Reserves Due to Subdivision

With subdivision, the traditional system of communally managed grazing reserves is gone and traditional elders no longer maintain control over access to grazing lands. Now, instead of certain areas being purposely set aside by the community for use during the dry season and droughts, all of the land is being grazed throughout the year. One livestock herder said:

Before we subdivide the land, and there was a wet season, there was one side of the land which we used, and in the other time we shifted to that other place, and today, this man is here and another person is in another shamba, when the dry season comes everywhere has been occupied, so there is no, we call it, reserved land for the dry season, so the drought strikes very much because every place has been occupied (Group Interview #3).

### Subdivision Effects on Livestock Mobility and Access to Grazing Land

Livestock mobility during dry seasons and drought has become limited because of subdivision. With subdivision, “you are very much restricted. There are a lot of restrictions, because of, you know, ownership of land” (Individual Interview #5). I was told, “with subdivision I become limited because there are places that I cannot go, it’s not like the time when there was no subdivision because you could just move where you want and right now I am just limited to my land” (Group Interview #2).

Variability in rainfall across the landscape means that some plots of land are better for grazing than others. Many livestock herders complain that the size and location of their individually owned plots of land do not support

enough livestock to meet their needs. The lack of mobility adds to this concern.

We thought subdivision was a benefit, that was our thinking. Because you own your own land and if you fence it and you look after it nicely, and you have your own livestock and rear them nicely in your own land. So the first time we get with them, we fence them, we put dams, other people drill boreholes, cause he has his own place. We thought it would benefit, but after we saw it's a loss, because you cannot go anywhere, because you have your own land, you cannot share with another person. So the system doesn't go the way you want, because sometimes you don't have rain, and your cows cannot migrate to another land. ...So you try to go to another place but you cannot go because every land is being owned by individuals so you don't have any place to go, so it's a loss (Group Interview #3).

Because grazing land is limited in Mailua and there are no longer areas set aside as reserves, people are sometimes forced to go elsewhere.

Specifically, "everywhere could be a shamba, we have shambas like this, cultivating. But now because of animals, they have to move, even to a place where you are not allowed to enter, even to the national park" (Individual Interview #1).

### Subdivision Effects on Water Access

According to many livestock herders in the area, subdivision has made it more difficult to access water for livestock because watering points on the group ranch are few and far between.

We have seen that land is becoming more congested, because we are living where we did not live before, because you are forced to live even where you cannot reach water, ... you go to stay there because it is your land, you have to travel to get water, you have no water, you are in a dry area, nowhere to go, it is not very easy to get water (Individual Interview #1).

In many cases, livestock cannot travel directly to water points because they are barred from access through other individually owned ranches. The alternative is to drive livestock several kilometers around these ranches to get to water, often along public roadways where there is little or no grazing available. These long treks can tax livestock further.

You can't graze to anywhere, you see there are communal routes, because that is how the subdivision is set, you see, the surveyor has to set up for movement, because of the individual ranches. So this is the most difficult thing that we see and it is affecting the livestock. ... Because you see ... walking 30 kilometers or 20 kilometers roundtrip to water without grazing, you see it's bad, you see, because animals, I mean cows need to graze, and need to after taking water, they need to graze (Individual Interview #5).

Livestock are most affected by these long distance treks for water during the dry season when animals are already stressed. I was told, "it is affecting the health of the cows because of long distances without grazing, so that the only time when the health of the cows is good, is when we get rain, that is the only time" (Group Interview #5).

One livestock herder was concerned that the concentration of livestock on these public roadways can lead to environmental damage.

So the one who has gone far from water, you are supposed to walk many kilometers to the water source, and even in the wet season, there will be soil erosion because of the tracks of the cows going to the source of the water during the dry season. That is a main other danger (Group Interview #3).

According to one elder, most of the people in this area depend on boreholes for water, but these are not always dependable, especially during drought. When these boreholes run out of water, people have to travel even

greater distances from their individually owned ranches to get water for themselves and their livestock.

That is another very big challenge, since the land was subdivided. Because it was subdivided before such challenges were addressed. You see, because there are very few areas with water on the group ranch. Um, mostly the group ranch depends on boreholes and boreholes are not dependable because they run out of water sometimes, especially during the drought, and we get a lot of problems getting to where water is, especially on the slopes of this mountain here. ... So for those fellows who are living there, when their boreholes run out, they come all that way up to Milotisa to get water. A long ways, they come overnight, and then they go overnight again back to their homes in search of water. So, so far, right now, the problem we have in Mailua is mostly water (Individual Interview #5).

Subdivision exacerbates the difficulty of accessing water for livestock and makes it harder for some landowners to maximize the potential of their land for livestock grazing. One livestock herder said he was not able to keep all of his cattle at home because his land was so far from water.

We don't have all the cows here, because of the problem of water, so some cows are in another boma, the only ones we have here are those for milking, so ... we bring water for them, like the car you saw, we have the car, so we bring water for them, we don't keep all the livestock here because of water problems (Group Interview #5).

Many Maasai do not have regular access to a vehicle, so transporting water long distances for livestock may not even be an option for them.

One farmer and livestock herder was concerned that individuals might be deeded certain water sources as a result of subdivision. He said that if individual landowners controlled water sources, they might not let their neighbors have access to the water. He said, "in this area, we have a source of water, and if people are not careful, one person can be given that source of water. It is dangerous, he can get a shamba there, and immediately you get

that shamba and you don't give to your neighbor, yeah" (Individual Interview #6).

### Subdivision Effects on Livestock Numbers

The small size (approximately 150 acres) of the individually-owned ranches, combined with non-migratory grazing and limited access to year round sources of forage and water limits the number of animals people can own and accommodate on their land.

There is a lot of effect from subdivision, because right now somebody can only own 150 acres, so you can just keep few cattle, or few goats, not like before subdivision, because we used to grow a lot of cows, there was no limitation but when subdivision came we got limitations on rearing cattle (Group Interview #2).

One landowner (Individual Interview #1) said his 150 acres couldn't even feed ten cows. Limitations brought about by subdivision have forced some landowners to sell some of their livestock. According to one livestock herder,

because you cannot have a lot of cows right now, if for example, you get a lot of cows, it will force you to sell them, because it depends on the piece of land you have, and I am only limited to the circumference of my land, so it depends on the piece of land I have for my movement of cows and the amount of cows I should own (Group Interview #2).

One Maasai landowner said this is a problem faced by all Maasai livestock herders living in communities where land has been subdivided:

before subdivision, we used to own many cows, and nowadays because of subdivision and small lands, you cannot, you have limited amount of cows. So the number of cows dropped in Maasailand, because you cannot get enough land to rear your cows, that is the change that subdivision brings (Group Interview #3).

Some of those interviewed for this study felt limiting livestock numbers was a good thing because it has created a more equitable distribution of wealth and grazing land.

Yes, before subdivision we see that, during that time, we see there are people who have a lot of cattle and the others who have little, but we see that all land was being shared, the person who has a lot of cattle, and the one who have little, so we see the land was being shared, so we see that when the land was not subdivided other people were being affected because there were those people who have a lot of cattle, and they didn't give, they finished grass and people who have little cattle suffer so right now, when the subdivision came we see it as an advantage for people who have little livestock because they enjoy their own land (Group Interview #4).

#### Subdivision Effects on Livestock Herders' Response to Drought

The prolonged drought that struck east Africa in 2005 and 2006 was one of the worst droughts in memory. According to one livestock herder, "It was different, because this drought was very long." Another man told me,

We saw very bad things, the grass was very dry, the sources of rivers in the mountains had dried up, just boreholes were helping us, even dams dry up, and everything that was, every plant died. ... It was very different, because it was a two year drought, many cattle died like we have never seen, this drought, in Maasai I see, the other reason this drought was different because in other droughts I have seen, there was water, we have no grass but we have water, but this one there was no water and no grass (Individual Interview #4).

According to many of those interviewed in this study livestock deaths attributed to the drought were higher than ever before according. According to one livestock herder, "some were left with just one cow" (Individual Interview #2). The effects of this drought on cattle numbers continues to plague livestock herders because cattle are slow to reproduce. One livestock herder told me, "We lost a lot of animals, almost every elder used to have many

animals, I lost more than 50, before I had 70, now I have roughly 20, I am coming back slowly” (Individual Interview #6). During the drought people tried to buy grass.

We have a change because before the drought, which many cattle died, we had people who were paying for that grass, but right now they don't pay, because everybody has few cows, so the shamba I have is not for my cows, I am giving them, they don't ask because they have enough for themselves (Individual Interview #7).

Some livestock herders were forced to travel far in search of water and pasture for their livestock. Finding grass was made more difficult by the need to pay for grass and because some areas like national parks were off limits for grazing.

Many cows have died and we migrated up to Tsavo. And the other problem was we sold the healthy cows to try to rescue the dying ones so we buy grass, we sell the healthy cows, we buy grass for the starving cows, and we lose the healthy ones and we lose the starving ones, because I sell the healthy ones and the starving will not survive. ... We buy grass from the Kamba before we reach Tsavo, because Tsavo was free, ... but there was also limitations in Tsavo because it is a natural game reserve, it is a game park, so there were places which were quarantined which we could not reach. There were game wardens and they were disturbing us very much because they don't want wildlife interacting with livestock in the park (Group Interview #2).

The search for grass made little difference because the drought was everywhere. In addition, traveling greater distances exposed cattle to exotic diseases.

Oh that drought affected almost everybody including myself. Because personally, I moved like anybody else, we went all the way up to Nairobi, and then down to Machakos to, we ended up there. And then we went there, we found, grass in spaces. But the place was bad, because there was a lot of diseases. ... Diseases that we do not experience here, so it affected us much. ... The drought was following us, and then on top we experience a lot of diseases again, within the drought, so we lost a lot of animals. ... About a 150. I had a lot of cows,

I had over a thousand, I was one of richest fellows around here (Individual Interview #5).

Others stayed and tried to wait out the drought.

I did not really move, but it really affected me, I had 70 head of cattle and 50 died, I struggled for a long time, and I can say just because of god, because at that time I became so weak, because it is a long drought, animals dying, getting them up now and then, feeding with, we buy the grain, and then it has affected me, you see because I did not move, but even those who had moved, they lost thousands of animals, I can say I was a bit better because I did not move (Individual Interview #1).

The subdivision of the group ranch made it more difficult for livestock herders to deal with the drought because it limited mobility and eliminated traditional drought reserves. One livestock herder who took his livestock beyond the borders of the group ranch in search of grazing land remembered a previous drought and said:

We migrated with 300 cows and we returned with 100 cows. ... I only remember 1984, and it didn't affect us like that. ... The difference was that at time there was no subdivision, so the land was wide, so we could move free, so that there was a lot of grass at that time, there was a place we moved to this side up to Tanzania so that was the advantages of that time (Group Interview #2).

According to another livestock herder:

Me I am seeing that before subdivision, our life was good. Because at this time, every time when the drought comes our cattle must die. Because we are seeing that God is giving us rain, but the problem is everybody has his own land so everywhere is being occupied. Because at that time, when the land was not subdivided there were reserves, places in which nobody can go there unless in drought season (Group Interview #3).

Subdivision contributed to livestock losses because of the difficulty of accessing pasture during droughts:

Yes, because we have seen that during that dry season there are people who have lost many cattle, because we don't have any place to go because the land belongs to individuals, if somebody doesn't give you access to their land your cattle can die, so it contributed (Individual Interview #4).

### Changing Livestock Breeds

Many livestock herders, aware of the restrictions placed on livestock numbers because of subdivision, are trying to improve the local breeds of cattle, goats, and sheep by crossbreeding their animals with exotic breeds. They hope to increase milk and meat production while reducing the overall numbers. They see the shifting of livestock breeds as one of the best ways to mitigate the difficulties brought about by subdivision.

Subdivision affected me in this way .... It depends on the bigness of the land I have, ..., so the people who have small land they rear less animals and because of this I am changing the breed .... I am going for the cows that when I rear few I know they that they are more beneficial than the ones I had (Group Interview #1).

According to another landowner, subdivision has made it difficult to manage large herds. By changing the breeds of his cattle, he can more effectively utilize the resources of his individually owned ranch.

The new breeds will be more beneficial to you than the many you have now. Because this many are bringing headaches, because there are many, they are dying, you don't have the land to rear them, so they are becoming a problem for us, so if really, we try to utilize the small land by bringing the good breeds, there will be more benefit (Group Interview #2).

Many livestock herders are commercializing their herds for the added income. They believe that they will be more successful by changing livestock breeds.

we see that we have a very small land, and also, we need money, now everybody needs money, we send kids to school and need money,

these kinds of change brought that kind of idea, so that is where we get that idea (Individual Interview #6).

These livestock herders believe that the Maasai cattle breeds were good when people were less concerned with making money because they were very hardy, and when you had more land you could have many of them.

Nowadays, people are commercializing their herds and the local breeds are no longer seen as being advantageous.

We are changing the breeds of the cattle, we had Maasai cattle, and those cattle have an advantage because they can stay for a long time and they become many, ... but now we are changing them to commercial use purposes, so we are changing to better breeds (Group Interview #5).

Many people are crossbreeding their cattle with both the Sahiwal and Boran breeds. Some landowners have even brought in a few Jersey and Friesian dairy cows for milk production. Both the Sahiwal and Boran breeds are known for their ability to outperform most indigenous cattle in both milk and meat production, and many livestock herders have seen the money these exotic livestock bring at the market compared to their indigenous breeds. According to one livestock herder, "When we take our cattle to the market, we see that our cattle has less price than the others, so we decide to change because of that, so we saw them at the market place" (Group Interview #4).

Individual landowners who have been to other parts of Kenya have learned of these other breeds. One livestock herder told me, "I was taken to agricultural seminar in Nanyuki and I was educated, and I was told the benefits of having these cows. They will be more beneficial to you than the many you have now" (Group Interview #2). Others have learned from Maasai who are

crossbreeding and have their own bulls. One livestock herder said, “I saw them in other group ranches like Meto. We saw that it was a good idea because the quality, even when you sell, they have that difference in milk” (Individual Interview #4).

Some landowners have made connections with farms in other parts of Kenya like Nanyuki and Naivasha where they buy Sahiwal and Boran bulls to crossbreed with their traditional Maasai cows. I was told, “We got another bull from Nanyuki. That is where we, the Maasais are going today. Anytime we feel like buying bulls we go all the way up to Nanyuki” (Individual Interview #5).

Others have been able to benefit from livestock herders who have already brought these bulls to the community. One livestock herder said they could get bulls from Naivasha but that right now they had “an advantage because we see there are people who did that a long time ago, and we go there” (Group Interview #5).

Crossbreeding native Maasai cattle with the Sahiwal and Boran breeds yields offspring that are bigger, so landowners can increase their productivity and earn more money with fewer animals. One livestock herder told me he prefers crossbreeding with Sahiwal cattle “because they have a lot of meat, they have a lot of milk, they have both milk and meat so they are more profitable than these ones” (Group Interview #2). Another livestock herder told me he prefers Boran cattle for the same reasons: “we are bringing Borans, because they have milk, they have weight, they have meat, so we are preferring those Boran cows” (Individual Interview #2).

In addition to increased productivity and profitability, some believe that the offspring of Maasai cattle bred with the larger breeds like Sahiwal and Boran are better able to adapt to the local environment than European breeds:

we have gone for the Sahiwal because there are other breeds like Friesian and Jersey, ... environmentally, they are not good, for even the distance of water, we are seeing that even Jersey, these other breeds, the Friesians, these milk cattle, cannot tolerate that long distance trek, so we have seen that the Sahiwal can cope with our environment, that is why we go for Sahiwal, because they bring money, and they are good, even in our environment they can do good (Group Interview #5).

### **Research Objective Two – Subdivision Effects on Decision-making Processes of Maasai Livestock Herders**

#### Individual Land Management and Decision-Making

For many livestock herders, the traditional system of sharing grazing land and setting aside grazing reserves has been replaced by individual decision-making regarding one's own livestock and natural resource management on privately owned land. The decisions that used to be made by elders and the community about where and when to graze animals are now being made by individuals for their separate pieces of land. One livestock herder said, "right now, you will be planning for yourself, that this place belongs to calves, this place, during the dry season I will use this place, so its your own plan, you have land for your own plan" (Group Interview #3). Some landowners are using some or all of their smaller five acre shambas for grazing reserves instead of for cultivating crops. Additionally, some landowners are developing water sources on their larger pieces of grazing land.

Across the landscape, the Maasai tradition of not putting up permanent fencing mostly continues. Individual plots of land are often fenced with brush to indicate the boundaries between plots of land. These fences are only visual indicators of boundaries and do not keep out livestock and wildlife.

Several residents interviewed for this study welcomed the concept of privately owned land and being able to control their own affairs. According to one livestock herder who liked subdivision,

Subdivision, when it came I thought it was a good thing, because now I can own my own land, I can plan for my own land, so I saw it as a benefit. ... Subdivision I think is a benefit for Maasai. ... You are sure of your place, I can do anything I want, I can build, I can keep my children here without any disturbance, so it is somewhere I can plan for my own (Individual Interview #4).

According to another livestock herder,

It is indeed a good thing because sometimes somebody owns his own land and that is good. ... I like the way they have given me my own land. It is up to me whenever what I want to do with my land, if I want to give my friend, I can subdivide to my friend, I can do to my land what I need, it is a major advantage. ... I can utilize my shamba how I want, I can use my land the way I want, so if I get somebody who wants to help me in anyway, it's my right to do what I want in my shamba. I like it (Group Interview #1).

Others said that they were initially excited about the prospect of controlling their own land subdivision, only to discover after it happened that it was not good.

We thought it was a benefit, that was our thinking. Because you own your own land and if you fence it and you look after it nicely, and you have your own livestock and rear them nicely in your own land, so the first time we get with our land, we fence it, we put dams, other people drill boreholes, cause he has his own place. We thought it would benefit, but after, we saw it's a loss, because you cannot go anywhere, because you have your own land, you cannot share with another person. So the system doesn't go the way you want, because

sometimes you don't have rain, and your cows cannot migrate to another land. So every person is viewed as a bad person because he has his own land. So you try to go to another place but you cannot go because every land is being owned by individuals so you don't have any place, so it's a loss. So we rush to bring loans with our title deeds, we cannot return because you buy cows and then drought comes and all of them die and the government wants your money and you have the loan until the day you go and sell your land. So instead of getting the benefits that we were expecting you get a loss (Group Interview #3).

One elder complained that since the land was subdivided there is a lack of community leadership and people are just doing things on their own. This makes it very difficult to bring the community together and help them make adjustments:

There are lots of things which have been done, but due to the current political situation affecting the whole country, and due to the lack of proper leaders to bring around as much as we know, what is required of them, unless you get somebody to call upon the members and sit down, such as that, everyone, people are just doing things on their own, without proper direction. ... Say, for our people, knowing what they are supposed to do, you know, it has been ten years without holding a big meeting, so we decide on our own, we decide to build a school, we need a kind of program which will help us learn ..., so the community does not get proper direction to see ... whatever ... is needed to implement (Individual Interview #3).

### **Research Objective Three – Subdivision Effects on Maasai Social Networks and Cooperation Regarding Natural Resource Management**

#### Subdivision Effects on Communal Living and Sharing

For some residents, the sense of community, security, and sharing that comes with living with others is gone because of subdivision. For example:

When subdivision came I get my own land, my goat became only mine, my child became only mine, and the other person, my neighbor, his child will not belong to me anymore. And that is where the danger is, because he lives in his own boma, and I live in mine alone... So this thing has separated us (Group Interview #3).

Another livestock herder feared for the safety of his family and livestock and was concerned with not being able to get help if it was needed.

Before we lived in a community, a very big community, big family, there before so we can graze in our very wide land, but now because we have become individual landowners, I have to live here alone because I have to go live in my small land. It is not so good, because you find many people, they don't have security now, because we lived in a community, because we don't live in the town, we live in the bush ... so we don't have security, if anything happens, you don't have anybody to help you because maybe I have to go to town because of children, I leave my wife here, if anything happens, nobody is here to help (Individual Interview #1).

### Conflict Over Property Boundaries and Access to Resources

Despite subdivision, there are times when livestock herders have no choice but to move their animals. One livestock herder told me that sometimes he must find grass elsewhere:

It is just that I have, the number of my cows has been reduced because I cannot rear as much as cows that I needed because the land is small, and I cannot do what I want because of the limitation of the land so sometimes I am forced to sell my cows, sometimes I am forced to go and find other grass from other people's shamba so that is the things I have changed (Individual Interview #2).

Some livestock herders complain are left to beg for grazing land when their land can no longer support their livestock. According to one landowner, there is no alternative other than to beg for grass when it is needed:

it's just that we don't have any other alternative, because this subdivision, before we have been using the land together, because for example, now I must beg for everything, if this man has grass, I must go for him and beg him, for example if there is rain in this land, in this place, and there is no rain at my place, I must beg always, that is a main problem (Group Interview #3).

When everybody owns and controls their own land, just asking for permission does not guarantee access to other people's grazing land. Having to ask permission to graze livestock on another's land is seen as a major change brought about by subdivision. One livestock herder told me "Yes, there is a change, because nowadays after subdivision everybody owns his own land, so you must go and ask for permission to graze on his land, some give you, some refuse, so we see it as a problem" (Group Interview #4). Another said, "If the land was not subdivided who could have been begging? We could have been using it" (Group Interview #4).

Subdivision has led to conflict and strained relationships among individual landowners. Having to always ask another for access to grazing land can cause enmity.

Yes, because people had good relationships, but people nowadays have bad relationships because we can get rainfall here and some places get no rainfall, so you see, right now, the other places can get rainfall and other places have no rainfall, so it can be difficult for you to move freely without asking, because some can give you grass and others will not, that is how it has affected us (Individual Interview #4).

The movement of animals from one piece of land to another without landowner permission has created conflict between neighbors. Without fences it can be difficult for residents to prevent livestock from trespassing and this can lead to landowner disputes.

Before subdivision the land was wide so cows will, they will have a wide place and no one can control you. After subdivision, if your cows go to another man's shamba there will be a quarrel ... so if by mistake your cows enter somebody's shamba there will be a quarrel there. So we get many differences when the land was subdivided. ... Sometimes if you find yourself in the wrong place, somebody else's boma, the owner of that shamba and will give you a warning and if you defy his warning he

will take you the police or you are forced to pay for the grass you have taken (Individual Interview #2).

Because of subdivision it is no longer culturally acceptable to move livestock without permission though another's property.

one thing we see is that rainfall is not predictable, and when it rains there is plenty of grass, you can see around right now, people tend to move from the other end because rain passes, ... where you are, where your shamba is, and you move without permission from the owner, you will be chased away immediately, because you are found to be one of the worst elements around your area (Individual Interview #3).

Other conflicts can occur between neighbors over boundary disputes.

According to one livestock herder:

Yes, subdivision has affected us much because it brings enmity, for example you can meet people who have shambas near each other so sometimes they quarrel because of grass, sometimes they quarrel because of boundary so it brings that effect. So the big problem we have right now is boundary disputes because many people have boundary disputes after subdivision (Group #4).

Wealthier livestock herders, including those with ranches larger than 150 acres acquired before the group ranch was created, sometimes graze their cattle without asking and there is little others can do.

You see we have small shambas, we don't have anything to do with the shambas but we are told to have many animals, but our shambas cannot contain them, you see. You find it now, those that have big land, they finish their land, and here they come to come to finish our shamba, because, we do not fence our shambas, so they release their animals, they release their animals and then they come to our small shambas, because they are not fenced, you see, so you cannot defend, you cannot block, you cannot do anything (Individual Interview #1).

### Subdivision Effects on Relations with other Maasai Communities

Subdivision has made it difficult for the residents of Mailua to share with other neighboring Maasai communities in both Kenya and Tanzania that have

not subdivided their land. The subdivision of Mailua Group Ranch has reignited a boundary dispute between the Matopato section of the Maasai (of which Mailua is part of) and the neighboring Kisongo section.

The boundary dispute originated in 1969 when group ranches were being created. At this time there was a disputed boundary between the Mailua Group Ranch in the Matopato section of the Maasai and the Olgulului/Lolorashi Group Ranch in the Kisongo section of the Maasai. Mailua residents revived this dispute in the 1990s when the border was surveyed during the Mailua Group Ranch subdivision. One elder who has lived his whole life in Mailua told the story this way,

the land demarcation was done in 1969, for the group ranches, and I think that was done when Oloitiptip was our MP from here up to Loitokitok, and he belonged to the Kisongo, way back, and because he was powerful, he could talk to the president, Jomo Kenyatta, he could use influence to do what he wanted, we have been crying foul because of what he did to us, later on, they tried to rectify some facts, but before everything was completed, and most of this land was subdivided, Amboseli and much of Kisongo's land, he was trying to squeeze our land into, to minimize the number of acres in Mailua Group Ranch and then bring the Kisongo to not share the land with us, therefore as he went on doing that, the tension was brought, even our leaders were beaten, he died before the land issue was ...settled so we began once again, around 1995, and that is when the question of the boundary was made, so there is a portion of land right now, which the Matopatos are claiming to be theirs and the Kisongo are claiming to be theirs. And that is why they couldn't allow our animals to move across their border, because we have not agreed (Individual Interview #3).

This boundary dispute, combined with the difficulty in negotiations over grazing land created when one community is made up of individual landowners and another is still communally owned and managed, has made it difficult for some livestock herders to migrate beyond Mailua during times of

drought. In some cases livestock herders from Mailua have to beg for access to grazing land in other communities; others have been refused outright even during the major drought of 2005-2006.

Yes, because for example, us and the Kisongo, they didn't subdivide, so they cannot allow us to go just the way we want to go .... Because we subdivided the land, and they didn't subdivide their land. So they have big lands, big bomas, so the decision of where the cows go depends on many people, but in our place it depends on the individual, so if you go there you see the difficulty .... I am saying, when I move, they refuse to let me go there, because they say 'it is you who created your problem by subdividing your land, so I will not allow you to come to my land because I am ok. It is you who subdivided your land, so that is your problem, so because if you want to come to my place, it is you who brings your own problem.' It is hard for us to go there because they don't like that we subdivided and say it is our problem, and it is hard for them to come to here because they are in a group and we have many individuals and they cannot bring all of their cows to one small place (Group Interview #2).

### Pasture Agreements and Cooperation Between Individuals

Many landowners realize that in order to survive as livestock herders they need to cooperate with each other and share their pastures. Some livestock herders see the ability to cooperate on an individual basis as a benefit of subdivision and private land ownership.

I find that it is easier now, to manage things the way we want and the way we are treated rather than before you had to talk to people from other locations for help, it is now easier to get people circled together. Before the subdivision it took longer for any type of bringing people together, otherwise, it could take five to ten years, but right now you can solve a problem in two to three weeks (Individual Interview #3).

According to one livestock herder, because people share traditions it makes sense to help each other,

I go to help them, so now we can cope in that way, and then because we are farmers, have animals, so we can live in the same life, because

I am not doing something that is different from the life we are living, we are living the same life, I have a family, I have animals, I have children, so we can cope together (Individual Interview #1).

One Maasai landowner told me, “even after subdivision we can still share. ... We can share, because the health of the animals, they need ... a large area to graze, so actually we don’t fence everywhere, we still share” (Individual Interview #6). Some livestock herders are optimistic that sharing pastures can help alleviate the difficulties brought about by subdivision.

Yes, sometimes there is a shortage of grass in my land, I go for another person’s land. So we are sharing like this, we normally share grass in our shambas, in our land because sometimes some places can get enough rainfall, and other places not enough rainfall, some lands have enough grass, and other have no grass, so we just share like that. You come and ask, if I see that it is good for me to accommodate you, I just let you (Group Interview #4).

Sharing grass is seen as one way that people can overcome the limitations of subdivision. I was told that “It is not good, because we see people are separated, the good things that I am seeing, is what Maasai have, because they can overcome the boundaries and they can share the grass” (Group Interview #5). They see sharing their land as a continuation of the Maasai traditions of open access to pastures without permanent fences.

These days this shamba belongs to him. But they share the land without any problem, when we come out of Mailua town, through the main road, all of the land is subdivided. But it is just on paper, because there are no fences. If I don’t have cows, I give my, the use of land, that is one benefit that we have (Group Interview #3).

Sharing land for livestock is accomplished through various formal and informal pasture sharing agreements. Sometimes it is as simple as just asking another landowner if he will let you graze your livestock on his land.

Our life has been difficult for a long period of time. We have been people who have, for example we keep on moving, right now we were from other boma, now we came here. So right now are in our permanent home, and just recently, even our cows, return .... We took them near this mountain, because what was disturbing us is no grass, water was a problem, so we go near water sources. ... We go to other people's shamba. ... We just ask for permission, and we, so we go there, we ask for permission to graze on their land, and drink water, and they give us (Group Interview #5).

Sometimes people must negotiate for access to grazing land.

According to one farmer and livestock herder, "long time ago, in dry seasons we have an area which we know we can migrate from this area to that area, graze there, after it rains you come back, but now you stay in your own area, if you want to move ... you ... negotiate with somebody who has land there, or maybe (Individual Interview #6).

Negotiations may be required due to the limitations of the smaller 150 acre plots and the number of different landowners in the area. Because grazing land is limited, difficulties can arise over allowable numbers of livestock and the length of time spent grazing.

The main problem with that is when other people ... ask for a place to graze, they will ask you, they will control the amount of cattle you bring to their land. Sometime they can tell you, we need only 50 cattle, sometimes they can tell you that we need only 20 cattle, and maybe you have 100 cattle. So subdivision changed things, because they will control the amount of cattle they will take for you, even if it is a friend, or your relative. Because even him, has cattle, so he can say only I can accommodate this amount of cattle. ... I am saying subdivision has affected us very much because, our interaction has become limited because, for example, before my friends welcome me to his place of land he must know how many cattle I have, the size of my herd, and I see that as one issue (Group Interview #2).

Family members as well as friends and neighbors are able to co-mingle their livestock herds and share grazing areas with each other in their individual

ranches. In one case, five neighboring landowners were sharing their plots of land, deciding when and where to graze their livestock.

We have only relatives and other neighbors. ... We cooperate with our other neighbors in this way because, we sit down, we talk, we say today we will graze in our land, and tomorrow we go to your land. ... We have five bomas, so five pieces of land working together (Group #2).

In another case, a livestock herder was sharing a plot of land and managing his herd together with a friend who had not been allocated his own individual ranch yet. This man discussed sharing grazing land with a friend and neighbor and managing their herds together in order to maximize the availability of forage for different classes of livestock throughout the different seasons.

We normally share like this, for example, ..., if there is another man that we are bordering together in the shamba, you can stay in one boma and then we reserve his shamba for other times or for calves and we use my shamba for wet seasons like this one, so if mine is finished we go to his (Individual Interview #2)

For some, sharing land is seen as a way to help friends, family members, and even strangers who are in need. One livestock herder said that he would even offer land to a stranger badly in need of pasture because he believed that they would do the same for him if the circumstances were reversed.

You can now move, because before you move, you come to my boma and ask me, can I get a place please because we are suffering, we are dying, can you please help me, yeah, because we knew each other, I don't like him to die, I can do, because I know that I can move there at that time. ... Yeah, even if I don't know them, because he will apply the same care to me, when there is no rain, I can move to you (Individual Interview #1).

Even though individual landowners control their plots of land sometimes groups of landowners and elders may get together and decide whether or not people traveling from other areas are welcome to bring their livestock to a particular area. A local elder told me,

They are going to decide whether to accept the movement of those animals or not. Even with rainfall and green pastures, the elders must decide first and pass word whether they are going to welcome them or not ... If you want to move from Namanga, you come as an individual with your own shamba but if you are to come to a different settlement which has leaders, elders, and they must all sit, agree on something, discuss about you, about you, and where you come from, whether there was an outbreak of foot and mouth around your area, or any kind of diseases, then you let people know where you are moving to, so that you come from a place without any rainfall, so that you accept us, so elders must sit down whether you are a leader or not, say you are our friend, a brother, you are coming to our place due to lack of rainfall, then are we going to allow them to come, or not, then we all decide yes or no, if it is no, we collectively say no and they have to go back. So that is when you are seen as a bad man (Individual Interview #3).

Some residents have even begun selling or leasing grass to others. Some landowners see the ability to buy more grazing land and grass if it is needed and available as a benefit of subdivision. According to one livestock herder, "This time, if I need another shamba or another land, I can buy so it depends for me which way of live I want to take" (Group Interview #1)

Sometimes Maasai who have few livestock may sell the grass to others who have more cows.

There are those people who have land, but they have few cattle, so when the drought comes, when their land still has grass, so you approach them, and you negotiate, and they sell for you (Group Interview #2).

Right now, you have about ... 100 or 200 animals, and me I have ten, I will make sure before I allow you into my shamba, you have to pay a certain amount, to use my grass (Individual Interview #3).

For those Maasai who don't have many cows, selling access to grazing land may be a good source of income. According to one local elder, "maybe I have a shamba, but I don't have cows, and my friend has cows, so he can come and buy grass, I sell" (Individual Interview #6). Selling grass is seen by some as a better alternative than selling land. One livestock herder, who had recently made a deal with another Maasai to lease 100 acres for 30 head of cattle told me, "instead of selling land, he is selling grass, which is good, it is much better than selling land" (Individual Interview #5).

Another example of post-subdivision cooperation includes several landowners pooling their resources develop boreholes and water dams. In one case, a landowner wanted to develop a borehole on his land and asked others to help him. According to one of his sons,

borehole drilling, like this one, its community work, it was in our shamba but when the water was found in our piece of land, we call all the community, we sit together and we drill the water, we share the water. ... It was, we saw that it was our father who decided and he called the community because we could have not drilled alone, because it was very expensive, so they decided to share that idea with the community (Group Interview #2).

At the time of this study approximately 50 households were using this borehole for both domestic and livestock purposes. People were able to get water for domestic purposes for free. They were paying 30 Kenyan shillings per head of livestock per month. This money was used for the upkeep of the borehole.

Elsewhere, landowners had formed a committee to develop boreholes and dams for community use. They had a plan to develop four dams but were looking for outside help to complete these developments.

Yes, we have a plan for water. ... We are ready to give out land for dams, and the main problems for dams that we have dug several years, has been caused by rain, and because we don't have the ability now, because we don't have much cows. So our plan is if we can get somebody to help us, we can give out money, the place, we have one dam here, it is helping wildlife. Because when it rains, long rains, after June, if it rains well after June, that water will be there up to November, so that water is helping wildlife and it is helping also us (Group Interview #3).

In another case, the country council gave community members control over a borehole developed in the 1940s. Many households pooled their resources to buy equipment for the borehole.

in 2005 they gave it to the community, the borehole is very old so we decided to buy the machine, from Netherlands, it costs us 300,000. So we got a new machine so we have that now at the borehole. If you are a member you contribute 15,000 Kenyan shillings (Individual Interview #1).

According to this man, this borehole was providing those who helped pay for the new equipment with water for both domestic and livestock purposes. He said, "we have 800, and maybe over 1000 animals getting water from there without including people, yeah. Bomas are so many" (Individual Interview #1).

In addition to developing water sources, local village committees have been formed to bring people together to develop churches and schools and deal with conflict that arises in the community. One livestock herder, who serves on one of these committees, said "we started another committee, me I am the chairman of this committee .... So that if there is any dispute, because in subdivision many disputes erupted because of boundaries, so that committee has been formed to look for those things" (Group Interview #3).

### Selling Land and the Effects on Maasai Traditions

Another major consequence of subdivision is the sale of land. When new Maasai landowners are given titles to their land many of them realize that when they own the land they can sell it, unlike before, when they did not have authority to do so. Because Maasai traditionally share land through communal arrangements, some consider selling land to be a breach of Maasai traditions. One local Maasai told me, “We cannot sell land, land will never sell, it is not the Maasai way” (Individual Interview #4).

Some local landowners believe that people are driven to sell their land because they are unable to meet their financial needs. According to one landowner, “Sometimes others sell because of school fees, others sell because they are poor, so they just sell because they cannot cope, they cannot be poor” (Group Interview #1). Some locals believe that landowners may be driven to sell their land for income or to buy more livestock. This is because they do not have enough livestock to provide for their needs. According to one livestock herder, “there are other people who have cows and others who have no cows, both of them were given land. And the one who has no cows will sell his land” (Group Interview #3). Another livestock herder told me, “So we have seen that other people have sold their land, during the dry season when their cattle died they sell their shamba and they buy more cattle” (Group Interview #5).

Others have sold their small five acre farms because they are not interested in cultivation and because the land is not big enough to support

many livestock. According to one landowner who has taken up residence on his small farm, “they don’t like to come here, they say it is a very small parcel of land, they are used to grazing animals so they say, this one is very small, so they go to their larger piece of land and this one they sell” (Individual Interview #6).

Many local Maasai believe that selling land is a major negative consequence of subdivision. Specifically, according to one Maasai livestock herder, “Yes, subdivision has affected our community, ... people get those shambas and they start selling, that is the most dangerous thing we can see” (Individual Interview #6). Another herder said:

when after subdividing we are seeing that there are a lot of problems because people have started selling the small portions of land that, you know, we have been given, so that is one of the challenges that we are facing right now (Individual Interview #5).

Selling land is considered a bad thing by some livestock herders because it can make people landless and poor. People who sell their land may have nowhere else to go, they lose their ability to make a living, and they lose their ability to pass their land to their children. Those who sell their land to buy more livestock may not have any place to graze their animals and they may be at the will of others to let them graze on their lands. One landowner told me, “selling land is bad, because you sell your inheritance. If you can sell land and buy more cattle, when the dry season comes, the cattle die. You don’t have cattle and you don’t have a shamba, and the poverty will be more than before” (Group Interview #5). Others who sell their land may be forced to move to town where they might have a hard time finding a job or making a

living. If people sell their land and move to town they will be “left miserable, because they don’t have anything to do” (Individual Interview #1).

The ability to buy and sell land can be an advantage for wealthy livestock herders, including those who have large land holdings they acquired before the creation of the group ranch. Specifically:

when they move, they have a 1000 animals, they can buy shambas, when they move out of their scheme, they can buy shambas, like from me, like elsewhere in Nairobi, because they have many animals, maybe over 400 animals, if you sell them, you can afford to buy another shamba. But me, I have 10 animals, so I don’t have money to go over 100 km and buy a shamba, and maybe it is 10,000 ksh a month, if I finish I need to go anywhere (Individual Interview #1).

When the land buyer is not Maasai and comes from outside of the community, their ideas and traditions may conflict with the traditional Maasai way of life. One Maasai landowner told me, “Subdivision is very bad, because it brings us to live with people who are not our tribe, people who are non-Maasai, and that makes us even to abandon our culture and our traditions because of that mixup, you see” (Individual Interview #1). According to another local Maasai elder:

It has a lot of effect, because, one, our land is sold to somebody else, a non-Maasai, of course he brings in a lot of, you know, other things. I mean, he brings a lot of you know, something that is different from the Maasai customs, you see, so we fear that sooner or later our tradition is going to be changed (Individual Interview #5).

Livestock herders complain that when non-Maasai purchase plots of land they do not share resources with others. Then, “the danger that the subdivision has brought is because of the other tribes which bring another

tradition that if you have, you don't share with others. So the Maasai are adjusting to that way of life" (Group Interview #3).

Many of these new landowners are not livestock herders and they may use the land for other things like cultivation and plantations of exotic tree species like eucalyptus. This can lead to conflict between livestock herders and new, non-Maasai landowners over trespassing. According to one livestock herder, "When people sell, if you trespass it will be breaking the law and you will be prosecuted" (Group Interview #2).

Not only do many new landowners not share their lands, they even put up fences so that access to land for grazing livestock is lost forever.

The problem is, when a Maasai buys, we don't have a problem with that because he will not fence, but when other tribes, when they buy, the moment they buy, you will never step on that land again, because they will fence it, some even with an electric fence. So you will not go to that land again (Group Interview #2).

If they sell to non-Maasai, they get the land, they fence and they start doing other things so it is not good, if they come, you know the Maasais they don't fence, their own land, if my land is small, maybe another friend of mine, can help me, we graze all that area, but immediately you sell to another person, it becomes private (Individual Interview #6).

One livestock herder (Individual Interview #7) complained that this not only prevents access to the lands that are sold. Fences can also make it difficult for some livestock herders to share their lands with each other. I was told that, "If you can buy a land between us, we will not share land again because if you ... come and fence ... we cannot pass" (Individual Interview #4).

The idea for selling grass came from non-Maasais who were approached by livestock herders looking for grass and charged money for grazing access.

And they came also and taught people to sell grass, and that affects relationships between Maasai. But it was not from Maasai, it was brought by, when the land was subdivided and people sell the land, those people who have been, sell land from other tribes, and they bring another way of life, and they teach the Maasai how to sell the grass. That is the danger we have seen when the land was subdivided (Group Interview #3).

Some locals believe that if landowners understood the consequences of selling their land, it would not have become such a big problem. One landowner said “they are doing it without knowing the consequences behind selling. So we are trying to justify them not selling. But they say, everybody has his own title deed, and I’m a willing seller and I am selling” (Individual Interview #5).

## **Subdivision Effects on the Landscape and Future Opportunities for Conservation and Development**

### Cultivation

Some landowners are supplementing their livestock income by cultivating crops using irrigation on their smaller, five acre farms. One landowner, citing the fact that he could no longer have as many cattle as he used to, moved to his small shamba to grow crops.

Subdivision is just an advantage for those people who have few animals, but those people who have a lot of animals, it is a problem, that is why we preparing ourselves, we are changing to cultivation, because we are seeing that the value of the cows is going down (Group Interview #5).

At the time fieldwork was completed for this study, most of the shambas were not being cultivated while others were being cultivated extensively for both subsistence as well as for commercial purposes. According to one man, “we eat and plant maize, and if we get a lot of maize, we can sell a few” (Individual Interview #6). One Maasai community member has chosen to focus almost completely on cultivation for his main source of livelihood. He did this after seeing other people in Kenya benefiting from cultivation:

I am cultivating because I don't have the cows I used to have, they have died in the last drought, so this is my option for taking care of my children, I am looking after my children by farming. ... When I was in ... business, and I go to other communities, I see how they are using their land, sometimes I stay with people who earn their living with cultivation, so when we go to their bomas, I see they still have food .... And they say, we ... get our food from cultivation, ... from this shamba that you have seen, and they don't even have water for irrigation, but during that time the climate had not changed, so I saw there was a difference between us and those other communities, because they have food every time, and that is the time I was motivated to start farming (Individual Interview #7).

Although not widespread, some landowners are clearing and plowing land in the drier livestock grazing areas for rainfed agriculture. One landowner was plowing portions of his 150 acre shamba for rainfed agriculture to support his family. He said this was the best alternative because of changes in the climate affecting grazing, livestock water access problems, and not being able to migrate any more with his livestock.

We are moving to cultivation, ... we are trying to find an alternative. There is not much rainfall, ... those cows are not helping us financially, because sometimes they don't have milk, for example what you have seen, the number I have given you, is small. ... The population of people is high, that is the first reason, cattle are not sufficient for our livelihood, because we see there are many changes which are coming, and we never migrate (Group Interview #5).

Often, the people doing much of the work on the farms are migrants from other parts of Kenya or even Tanzania who can bring other attitudes about natural resource management that may conflict with the local Maasai culture.

### Deforestation and Charcoal Burning

Some landowners are harvesting their trees to make and sell charcoal in response to the need for income and the decline in numbers of livestock. Before subdivision, when the group ranch system was in place, forest resources belonged to the community and clearing trees was not allowed. With subdivision, trees become the property of private landowners and they are free to harvest trees and process charcoal for sale.

This process usually begins when charcoal harvesters approach landowners and offer them money for their live trees. The harvesters clear the land of whole stands of trees. The harvested trees are burned on site to create charcoal, leaving large areas of bare dirt, before the charcoal is transported and sold in urban centers throughout Kenya. One landowner, who recognized the connections between reduced livestock numbers, cultivation, poverty, and the push for charcoal burning, told me:

So we see that there other things which bring up charcoal burning. One thing is, when people are cultivating their land, you find they clear that land, so that causes them to burn those trees for the charcoal. Then the second thing is, many people have no other alternative. They don't have livestock, they have only trees. So the second option for their life is charcoal burning. You cannot let yourself die when you are poor (Group Interview #5).

Many charcoal harvesters are not Maasai and the landowners receive little of the profit. And although the transportation of charcoal is illegal in

Kenya, it is not enforced. A considerable portion of the traffic on the Namanga road that goes through the group ranch and connects Nairobi, Kenya, to Arusha, Tanzania, consists of lorries overloaded with charcoal destined for urban markets. Charcoal harvested in Mailua Group Ranch is often sold to these transporters as they pass through the ranch.

For many livestock herders, charcoal harvesting is a negative result of subdivision and privatization of land. One landowner told me,

You know, ... people are trying to look for the way of living, and that is a very bad way of looking for money, but people are doing it anyway, we are trying to stop that one, but if you get your own property you can manage it the way you want, but it is no good (Individual Interview #6).

Others complain that harvesting trees for charcoal affects the environment and the climate in ways that negatively effect livestock herding. One local elder said, "I can see that there is a danger, because you see now they have started to cut charcoal, and that is a way to destroy their land" (Individual Interview #3). According to another landowner:

It is not good, we have seen one thing, ... when I was a young man, young child, I noticed one that, during the rainy season, where there were a lot of trees, there was a lot of rain, so for example, charcoal burning affects us in livestock keeping. For example acacia trees, normally have a fruit, when the fruit comes down, our goats eat it, so they cut down those trees, so there is no more fruit (Group Interview #5).

A local governmental livestock official, who is also a Maasai, told me that acacia fruits normally provide food for both livestock and wildlife during the dry seasons when other forage is less available. Another Maasai landowner who has traveled outside of Kenya recognized that deforestation driven by charcoal

production is a worldwide problem. He believed that cutting down trees and the smoke created when making charcoal negatively affects rainfall patterns:

I see there is a problem with people cutting charcoal nowadays, you see now that climate of them having the smoke in that area, it will make the rain be so rare, ... I myself move to other areas out of the country and I foresee it is a problem making to the whole world, that we are losing rain because of cutting trees, because of that smoke, we cover the whole area (Individual Interview #1).

Another Maasai elder highlighted the negative effects of this process on the forest and wildlife habitat. He said, "It is bad. It is affecting the environment. It is diminishing the land and then it affects the forest, with it the forest is finished, and it is also not good for wildlife" (Individual Interview #5). Another local told me, "the drought which ... affected the Maasai in 2005, brought damage to the environment because when the cattle died the only alternative was to cut charcoal so you see it contributed a lot, to destroying the environment" (Group Interview #4).

One Maasai landowner concerned by these negative effects had approached government officials and NGOs working in this area about this problem. He believed the government was allowing this process to happen by doing nothing to stop it.

I mentioned charcoal burning when we have a meeting with AMREF and Worldvision. In fact I talked seriously to the government, that they should stop that, if they don't stop it we are going to suffer. But it seems that the government, they have agreed to allow burning, because people who are cutting, they are coming from out of Maasailand. They come to cut charcoal, there are many lorries on the roads, overloaded with charcoal (Individual Interview # 1).

One local elder hoped that people could find other uses of their land besides charcoal harvesting that were less damaging to the environment.

Yes, that is what I'm saying, ..., to be prepared to manage their land, instead of cutting the whole forest you have, you have to look for other ways to manage your land, if it is a dry area you graze animals, if you have a place maybe you can cultivate, maybe you can get water (Individual Interview #6).

### Wildlife Interaction Effects of Subdivision

There is still wildlife present on the group ranch although some Maasai landowners believe that there are fewer animals than there used to be. Nonetheless, interactions between people and wildlife have increased. According to many local landowners there is increased wildlife predation on livestock and the spreading of disease between livestock and wildlife has become more of a problem. There is more conflict over wildlife damage to crops and developed water sources.

We have a problem with wildlife, like elephants, because they are destroying our water, like pumps, so that is why we are trying to put this fence, but with elephants you cannot stop elephants with this fence. So we have a problem with elephants (Group Interview #2).

Settling people across the subdivided landscape has increased interactions between people and wildlife and reduced the number of wildlife in the area.

The Maasais they have good relationships with wildlife, this is natural, it is not something that is new, it is something that we are born with, and even now, with this kind of situation you can find lions, cheetahs, leopards, hyenas, because they know how to live together. It is only that animals are not free, they want a hideout, you see, like they used to have, otherwise the population of people is affecting them, because of subdivision, because every corner of the group ranch has been subdivided and it has been given to each individual person. So, if you go to where I live, my farm, you find some there, there are zebras there, there are giraffes, there are gazelles. But there is not as many as there used to be (Individual Interview #5).

Some landowners complained that when there is a problem with wildlife there is no help or compensation from the government.

The only problem we have with wildlife is the government is not helping us, because they are using our things, they are drinking our water, they are grazing on our land, they are destroying our pipes, but we don't see any compensation from the government (Group Interview #2).

Competition is a big problem when wild animals come to graze on individually owned plots of land.

You try to kill them, trouble comes from the government, so in fact we have a lot of problems, the government is not taking care of us because ... you see now, if you try to complain, they don't listen. So, you see, the wildlife bring diseases, those diseases affect our animals, because of wildebeests, they come to our land, they don't have anything to do, they eat all the grass, maybe 1000 of them (Individual Interview #1).

Attitudes about wildlife have changed. When the land was owned communally, the Maasai did not care about the presence of wildlife on their land, but now private ownership has changed that.

The only problem that we have, right now with wildlife I feel bad because it's my land, the other time it was not my land, it was a free land. So even right now I can show you there are lots of zebras, a lot of wildebeest, so they are destroying my land (Group Interview #1).

Some are even entertaining the idea of fencing their plots to keep wildlife out. Nevertheless, it appears that many Maasai landowners continue to share their land with the wildlife.

One landowner was concerned about the in-migration of outsiders who hunt wildlife and alter the landscape.

Well, unless the issue of wild animals is properly addressed the wild animals are not going to be secure on the group ranch. Because, you see, we are starting to see those people from outside who are not group ranch members, coming in to our group ranches, they cut trees, you know, they feed on these animals, and there is nobody taking care

of them, unless it is addressed it is very unhealthy. (Individual Interview #5).

There are few perceived benefits from wildlife. The Maasai are aware that wildlife brings tourists to Kenya but they complain that only the government benefits. Yet the Maasai are the ones who share their land with the wildlife and pay the price of conflict with wildlife.

We are not getting any benefit from the wildlife, and we are not the beneficiaries. Because of that, the few are left with no other option than to rear livestock. And surely in Maasailand there are a lot of benefits, but other people are benefiting, other than the people who are living there (Group Interview #3).

During the rainy season, wildlife from Amboseli National Park travel west to Mailua, but the Maasai living there receive none of the Park benefits.

Probably, you see now, we are very close to the national park, but you see we are complaining because we are not receiving any benefit, when it rains, during the rainy season, the animals come and finish our land, and then afterward they turn back to the national park, when you try to complain, the government says no (Individual Interview #1).

Any benefits realized from the national park do not reach Mailua Group Ranch; they are limited to the Maasai communities that are directly adjacent to Amboseli National Park.

Maybe if the government accepts, you know we get a lot of money from wildlife. If the government accepts maybe to give something small, like maybe a borehole, we get money to manage our borehole. That kind of thing we will be friendly with wildlife, but we are very much affected by wildlife. Animals like hyenas, they eat our cows, we don't see any benefit, lions they eat our cows, we don't see any benefit, elephants they come, even here, they come up to this area. They remove caps from water pumps and everything, they go to the caps, they take the whole water, we find no water, they mess up the machine to pump water, and we are not being paid by anybody. So we don't see the benefit of those animals, so maybe you know, we have wildlife there in Amboseli, and those communities who are surrounding Amboseli, they are being given something small, to manage. Maybe if the elephants

come and remove the cap, you can be compensated, but we, at Mailua Group Ranch we do not see such privileges, so we are not friends with wildlife (Individual Interview #6).

### Opportunities for Community-Based Conservation

Many of those interviewed had a strong interest in finding ways the community can benefit from wildlife conservation.

We normally don't kill them, because we know that one day they will benefit us, even if we see at this time the government has no mind for us, but we know that wildlife is a resource, and one day we will benefit from them, that is why we don't kill them. When they come and do destruction, the only thing we do is to chase them back, not to hunt them, to kill them, because we know one day we will benefit from them (Group Interview #2).

NGOs like the African Conservation Center (ACC) and the Kenya Wildlife Service (KWS) can teach the community to understand the importance of wildlife to society. Many Maasai in this community have seen the potential for wildlife conservation to provide financial benefits and help them put their children in school:

we have realized that living with these animals and getting help from groups like ACC or KWS, can help us ... understand the importance of these animals to the society, and how these animals are going to benefit us, especially when they come as far as sending their children to school .... Some people know the importance of animals for economic use and they ... have gone to see such conservancies in other communities. They have that question of getting a bright child to school but with financial constraints ... the parents are not able send their child to school .... With the possibility of some money ... to support ... these young ones, this has shown them that these wild animals are more important than our domestic animals. So this turn of events has led them to ... see the importance of getting help from these organizations, NGOs, and institute wildlife conservation projects which can be put into use, so when their leaders say let's follow this path, they all agree (Individual Interview #3).

Local NGOs and community members are working to create a community-owned wildlife conservation area for local tourism development.

When we sat down and agree for subdivision, there was an argument in Mailua to find a way that wildlife will benefit us so we go and consult about wildlife, and we were planning to preserve a place near the Amboseli, on the border between Kisongo and Mailua so we can build campsites, a reserve, that was our plan, we were trying to sit down as a group ranch to see if we could reserve that land. ... In some places, like Motoroki, some people there, people had that idea, and people were planning to reserve that area, swamp, we had a plan from the hills there up to the main road to there, we had the idea of reserving that land for wildlife, and we still have that plan. So we still have that idea, that plan of having a game reserve and place where tourists can come, and we agree as a group ranch and had a big meeting to do so (Individual Interview #4).

One organization is bringing together Maasai livestock herding communities in southern Kenya. This organization, called the South Rift Landowners Association (SORALO), consists of representatives from several of these Maasai communities that are working to develop community-based conservation initiatives. These initiatives include community owned and operated wildlife conservation reserves and ecotourism ventures. SORALO recognizes the importance of both wildlife and livestock herding. They are trying to find solutions that help maintain traditional livelihoods and realize the benefits that wildlife can provide. For example, representatives from SORALO hoped that landowners benefiting from conservation might be discouraged from engaging in destructive practices like deforestation for charcoal burning.

In spring 2008, SORALO was meeting with Mailua residents about the logistics of setting aside some of the land that had not been subdivided yet for a community-owned and managed wildlife conservation and dry season

grazing area. At one time, representatives from Mailua visited other Maasai communities to learn about these types of projects and were encouraged about the possibilities of community-based conservation.

We had a seminar ... we came to Shompole Group ranch, and we go to Olkirimatian Group ranch}, and we go to Amboseli, when we saw and we learned that it is very important for a place like Mailua Group Ranch to preserve a place for wildlife, we agreed (Individual Interview #4).

This same landowner thought that maybe some day he could further benefit by building a tourist campsite or hotel on his own piece of land.

I had this idea that along this road, if we reserve and tourists will come, we could also have campsites, like in my own land, they can have a campsite in my land, because when we have an excess of tourists coming to this land, we will build hotels, so we had this plan (Individual Interview #4).

In August 2008, SORALO introduced exotic bulls and heifers to the Mailua Group Ranch for crossbreeding with Maasai cattle. Other plans include encouraging the development of water sources that can be used by both wildlife and livestock during the dry seasons.

Many locals strongly support these ideas and are eager for these types of projects to move forward. They want the government and groups like SORALO to help them come up with ways that landowners can work together to protect wildlife in this area.

Through the leadership of the Group ranch and the Maasai in general together with the government officials, KWS Kenya Wildlife Service, and those who are concerned, because a person like me I cannot just go out of my house and start telling people not to kill animals. Because I am just one voice. So the thing has to be synthesized together with the government, you know, and a policy has to be produced of taking care of these animals, and then at the same time if SORALO is supposed to come in to help with such things and see if we can introduce a system

of farming in the group ranches by putting the manyattas in one line (Individual Interview # 5).

Others are pessimistic about the prospects for community-based conservation but believe that if details can be worked out the community will be ready.

We are pessimistic, we don't know if we can get help, but we have a formal plan, to bring to KWS. ... We haven't gotten that far. So right now we are, we need to see if we can get a piece of land for that purpose, the community is ready (Group Interview #4).

There is a lot of interest and agreement that land should be set aside:

Yeah, leaders have debated on that, they sit down, we went as far as thinking about a conservancy, for the land that has not been properly demarcated. From where we are now, ..., people around are coming to know about this idea, and we have gone as far as informing them and some of the committee members have attended with KWS, and they went to other places, committee members and some of the group ranch members, they see the importance of a conservancy, and there is an idea that we should at least agree on a piece of land which they are going to help them for wildlife (Individual Interview #3).

Despite this optimism, some community members are concerned about how land is going to be set aside for a conservancy. Specifically, if a portion of land is set aside as a community conservation area, there might not be enough land left for those group ranch members who have been promised individually owned pieces of land but have not yet been given their plots.

SORALO is working with the community to deal with this problem.

This is the place that is not subdivided, so those people who are supposed to be given that, they stay in other people's bomas for the time being. But they must agree because it was agreed that it must be subdivided ..., so there was an agreement that this land must be subdivided .... So that land they are trying to agree together, they are trying to agree together so that that place will be reserved for the community, not for individuals (Group Interview #3).

According to another livestock herder familiar with this process,

although that land now belongs to some individuals, ... we are thinking of sitting down with them, when the title deeds are supposed to be given, and agree on the number of acres to be deducted from their share to be made into a conservancy (Individual Interview #3).

Other landowners were concerned that they might lose title to lands they had been given during subdivision. During one community meeting about this project, SORALO representatives assured local community members that whatever happens, their title deeds would be recognized. SORALO supports a return to traditional land management while maintaining private land tenure.

### Climate Change

Another factor that contributes to the difficulties brought about by subdivision and privatization include a changing climate change.

Before, we had a lot of rainfall, after two months we see rainfall, at that time, we had a lot of cattle, and the population was low, and nowadays the population is high, and by that time, the land was not subdivided there was a good place for grazing (Individual Interview #4).

Many livestock herders believe the climate in the area was changing. They said the rains had become unpredictable and that droughts were occurring more often than they remember and lasting longer than ever before. One livestock herder told me, "Yes, there are those changes, we get a very short rain, and the drought is taking a long time, so that is another change, ... nowadays the drought is very long, the dry season is becoming longer" (Individual Interview #6). One livestock herder attributed this to global warming.

Oh, generally, the climate has changed, but not on Mailua alone, almost everywhere. ... One thing, I mean, global warming is one of the areas that we see, that has brought change, we are not receiving our normal

rainfall as we are used to, ... we are very much affected by the droughts almost every year (Individual Interview #5).

Another livestock herder told me,

In livestock, we are seeing a great thing because there is a climatic change, every time there is a drought which we were not expecting, so we see, rearing of cattle, of livestock is becoming difficult because of droughts, sudden droughts which were not expected, its not like other years, in some years there was no drought problem but now it is so (Group Interview #2).

Water shortage is becoming a bigger issue. One livestock herder told me,

“There is climate change because we don’t receive rain nowadays, and water, we see there is a lot of shortage of water. Different than it used to be” (Group Interview #4).

Compared to the past, longer droughts are making livestock herding very difficult in this area and the prolonged drought of 2005-2006 was considered by many to be the worst drought in their memory.

The Maasais were very rich at that time, because the animals, they didn’t die, and the drought was very little, it was very rare. But nowadays I tell you drought, almost five years, three years, a long drought, animals get finished and people are miserable, they live without anything, people are getting to Nairobi to get work, some people die because they have nothing to do, nothing to eat (Individual Interview #1).

I see a natural change, there is climatic change because there is no rain like the time when I was young, and there is a lot of drought. The droughts are the main factor which is making life difficult in our life because sometimes we have many cattle, the drought you can’t predict, you cannot tell whether the climatic change, you just try, and there is no hope (Individual Interview #2).

The ability to supplement or replace income and food produced by livestock through cropping can be difficult given the unpredictability of rainfall.

One landowner told me, “we are seeing that there is not enough rain, so we

see that there is not enough like it used to be, so we cannot plan for the seasons, like now, when you were looking at my shamba, I planted rice twice and it didn't come up" (Individual Interview #7).

Some livestock herders cited the present situation as an example of this unpredictability. The short rains which usually occur in November and December had not come, yet it was raining in January and February. This time of the year is typically a dry season in southern Kenya.

Yeah, yeah, climate has been different, as you see, we have got, we got plenty of rain a few weeks ago and sometimes our, people have moved from say Namanga around several different ends, most of the people around here have migrated from other places, and long time ago, rain around February, March, is something we could not expect, right now we see that from January up to this month, February is ending, there is something different and we actually are thanking god (Individual Interview #3).

### **Livestock Herding as a Contemporary Land Use**

Livestock herding remains an important land use in this Maasai community.

We have inherited this way from our parents, you were brought up with cattle, so you found that cattle keeping is very important, compared to other occupations, if you know other jobs like keeping a shop we are not doing that kind of job, all that we can do is, true Maasai do cattle keeping. We found that this is a profitable entity and so we want to breed our animals nicely (Individual Interview #3).

Across the landscape people continue to keep cattle, goats, sheep, and donkeys. During my fieldwork I saw camels in this area too, although camel husbandry is not widespread.

The Maasai in this community believe that livestock herding is the most suitable land use for the dry, semi-arid rangelands and woodlands of southern

Kenya. Despite subdivision, the land is still seen by many as a good place to rear livestock, especially when the rains are good and water is accessible.

I can see it is a good land for living for the Maasai because only the problems that we used to have a shortage water, which made us sometimes move to the mountain, to get water, because water is there, but now we depend on machines for water but sometimes, they go down, and you find people, they don't have water, even that can cause them to get far from their ranch, because there is no water, but the land itself it is really good, because there are no diseases, like east coast fever, you don't find it here, you don't find animals dying, when there is green grass, perfect, you don't need anything else, it is a very good area, good land (Individual Interview #1).

There are few options besides livestock herding in this area. One livestock herder told me, "because in this area there is nothing else that you can do, you can only have animals, and also you can have shambas for cultivation but the rain is very rare, its not dependable" (Individual Interview #1). Another livestock said, without other sources of benefits, "we are left with only one option, we look after our livestock, and the life goes on" (Group Interview #3).

Livestock continues to provide milk and meat for families and is still considered a sign of wealth. Income generated from selling livestock is used to pay for services like health care and fees for school. Livestock is still used to pay dowries for marriages and has other important ceremonial uses in the Maasai tradition. According to one livestock herder, livestock "is my source of life because I get food from them like milk, meat, money" (Group Interview #2). During the dry season when milk is plentiful the Maasai can sell milk at local markets. The Maasai of Mailua rely on other sources of food in addition to livestock. Yet, for many herders the money to pay for essentials comes

primarily from income earned from livestock. Livestock can even be gifted to others who are in need of food or money.

Nevertheless, there is a fear among some Maasai that if the ability to raise livestock is lost people will be driven into poverty.

It is our source, our way. We don't have any other source, you can see other people have many sources, but our only option is livestock. Those people, who have no cows, or livestock, they may end up doing things because of poverty. The main problem in our area is we don't have any other vision. We don't have other ways that we can get our food. ... If you don't have any livestock your life will be miserable (Group Interview #3).

We cannot reduce the number of livestock we have. Because if we reduce we might suffer, because that is the only dependency we have, so the more you have the more you educate your children, build good houses, you do other things. But if you don't have cows, if you have few cows, automatically you will be doing very poor at development (Individual Interview #5).

Livestock herding is still seen as the best way to use the land and provides many benefits for the Maasai. One local government livestock official, who is a Maasai himself, told me, "there is no better investment than a cow."

Another livestock herder said, "cattle are the banks of the Maasai" (Individual Interview #6).

### **Future of Maasai Traditions and Livestock Herding in Mailua**

Many of those interviewed for this study were uncertain about the future. According to one livestock herder, "It is very hard for me to determine the future. There is a saying in Maasai, it is very difficult to know something that is beyond that mountain" (Individual Interview #7).

Other local residents believed that change was inevitable.

Because change has to come, whether we like it or not. Life is changing, it is there already, the Maasais have changed already, even if you see the way they are staying today. They were not like this before, even five years ago they were not like this, ten years they were not like this, twenty years they were not like this, it was quite different so we see a very big difference today. The difference is because of education, and the environment. Being mixed up with different tribes. Lets say its changing their nature, you see, we don't find, we don't see change come, but every morning you wake up you see change (Individual Interview #5).

Several residents felt that subdivision could end up being be a good thing but that people were not prepared.

Maybe 20 years ago I did not see any importance for subdivision, but now I personally think if people are very well prepared, to do subdivision is good, yeah, because you get your own land, you manage your own land, so it is good, only people need to be prepared if subdivision is going to be there (Individual Interview #6).

Other livestock herders agreed that people were not prepared but that over time, as people figured out how to manage their own land, it would be a good thing.

In me subdivision is very nice, but the problem is we don't know how now to utilize the smaller land that we have been given. Because right now, you see, we still have lots of cows on that piece of land like before, and the time we will know how to utilize the subdivided land, I see will be more different than before. But we will rear the good breeds of cows, which has a lot of profit than these ones we have right now (Group Interview #2).

Some livestock herders believed that the government, along with NGOs could do a better job of helping the community finish the subdivision process and adjust to the subdivision of the group ranch. For example, according to one livestock herder, the government could step in and help complete the subdivision because the local community had not been able to it do it on their own.

Yes, maybe, concerning the subdivision, for the places where subdivision has not yet been done, for that one, maybe the government can help for these people get titles, because we contributed a lot of money, and those people who are managing the money, they have not done the of subdivision, so the government can help people ... be given title deeds (Individual Interview #6).

The same livestock herder said that the government could provide people with help to manage the land they are given through subdivision.

maybe another thing, the government has people who are educated, they can teach people how to manage their land, a dry area like that one, the government has people who have knowledge, they know how to teach people the way to manage that land and the area which is not dry, the government can teach these people how to manage that land, yes (Individual Interview #6).

Another livestock herder said the government should help people prepare and cope with droughts.

There is supposed to be the Minister of Agriculture who is supposed to lead the people about such things, because Maasais we don't even look ahead, to what is happening even next year (Individual Interview #5).

There is strong support for cooperation among landowners and for future involvement in community-based wildlife conservation projects. One local elder (Individual Interview #5) hoped that by working with the government and NGOs like SORALO landowners could manage their individual ranches together based on Maasai traditions. Landowners would keep their title deeds but live together in Manyattas and share grazing land within a system of reserves. This would work well with wildlife conservation, as wildlife would have access to more open land.

So the thing has to be synthesized together with the government, you know, and a policy has to be produced of taking care of these animals, and then at the same time if SORALO is supposed to come in to help

with such things and see if we can introduce a system of farming in the group ranches by putting the manyattas in one line. ... Yeah, if it is introduced properly, the manyattas can be on one side, and then the livestock can go grazing on one side, and the animals, the wildlife can have the good side for grazing without interference. ... You have your title deed, you keep it in your home, and we know where your shamba is in that communal land (Individual Interview #5).

According to some residents, the Maasai tradition of livestock herding will continue. One livestock herder said, “the Maasai and livestock are inseparable, they will always be together on this land” (Individual Interview #3). Some residents believed that livestock herding is becoming more difficult. For many, better land management and switching breeds of livestock or crossbreeding with more valuable animals will help with these difficulties.

In terms of livestock, in Mailua, the Maasai community, maybe what I can say if we complete this kind of demarcation, because it is not yet completed, those people who will manage their land properly, we will remain with our livestock, but the number will be a bit less, but we are going, but if they do that kind of crossbreeding, definitely we are going to manage our livestock and we will be having our livestock wherever no problem (Individual Interview #6).

One elder was concerned that the era of livestock herding was coming to an end. He said, “livestock is getting finished with the Maasai community. It is going to be only very few who are interested much because ... there are a lot of problems, you see, droughts, diseases, and lack of grazing areas” (Individual Interview #5).

Because of the difficulties surrounding livestock herding some residents believe education and other sources of income will become more important.

I can see maybe ... the life of the Maasai is not growing up as it was before, focused only on animals, people are becoming a bit learned, so you find people that ... changed their life, you know, people are working, you know, like in offices, but now dealing with animals, to me, I

foresee they maybe only need two cows for milk, that is what I've seen, but having more than 100 cattle, I don't see how that can survive (Individual Interview #1).

The changes I am doing, what now I am planning is to cultivate the land, and take my children to school, because we are seeing that there is no hope of getting, of having more cattle, so we are, that is our major change, taking children to school and cultivating our land, and having few cows (Individual Interview #4).

Another resident said that because of inheritance issues people would have to rely on different breeds of livestock:

I have my own land right now, so I use ... my livestock to take the children to school, and the time in school they come and change, everyone has his own share in my land so it ends up everybody having a small piece of land in my shamba. They will not get enough land to rear their livestock. So we will end up with just a small amount of livestock, of good breeds (Group Interview #4).

According to many of those interviewed in this study the human population of the community is growing. One livestock herder told me that with an increasing human population "cattle are not sufficient for our livelihood" (Group Interview #5). The small size of individual ranches does not work for large families.

And even the population of people is being controlled by the size of the shamba, you cannot get as much children as we used to have, the Maasais used to have even 10 children. So even we cannot be polygamists because of the size of land that every man has. It is controlling his life. So if you have many children and you don't have a place enough land to give them, it will be a problem, it will be very big problem, so those are the ways that land subdivision has affected our livelihood (Group Interview #3).

Some educated children have come to see the value of Maasai traditions and are returning to their communities to help in the future.

There was a time we were lost, ... when people go to school, they despise our tradition .... But nowadays, children of Maasai who have

gone off to university, when they come back from university and they return to the Maasai they tell us don't drop your tradition. This is ... like the Maasai who work with SORALO, ... they go to Loita and they go to Purko, they come to Matapato, they come to these places ... and our children who have gone to university are the ones who started these ideas and bring them to us .... So ... we have a bright future in Maasai because those who are learned are now seeing that in their land there is a problem, so we have that hope, because our children are coming back to develop our land (Group Interview #3).

Some landowners are planning to reduce their livestock numbers and become more involved in cultivation.

There is a change, in some years, there will be other different developments, like shambas, and at that time I will be rearing fewer head of livestock, because I will have many other projects, like a shamba. So I will not depend only on livestock. ... I am planning to cultivate 20 acres (Group Interview #1).

Another said that cultivation will be a good supplement for livestock, especially with fewer cattle of more productive breeds.

In me, I am seeing that the Maasai, have adapted two things, they are changing to cultivation, and the second is the changing of the livestock breeds, so I am saying, when the Maasais get enough water, their future will be good, because they will adapt themselves to having less cattle, which are valuable, and also, they will use other ways, like cultivation (Group Interview #5).

More people might build permanent homes on their individual ranches. With successful water development, people might not have to travel so far seeking water for their livestock and for domestic purposes. One Maasai landowner told me, "If I can get water, I can use a portion of land for irrigation, I can plant even grass for my cows, and the other part of the land can be used for wildlife animals, so I will not be forced to go, I just have that one idea" (Group Interview #5).

Without better development and intervention, the sale of land and the destruction of the environment brought about by subdivision will likely continue. According to one landowner, "So we feel that if the problem of water is solved, it will change the environment because we will plant crops ... and if we don't have any water, which will change our life, the next alternative is cutting down trees" (Group Interview #5). Another landowner believed that charcoal burning and selling land will continue. He said, "I can see that there is a danger, because you see now they have started to cut charcoal, and that is a way to destroy their land, the simple way that is they can sell their shambas, but without knowing where to go" (Individual Interview #1). Another landowner, concerned that selling land will mean the end of livestock herding in this area, was optimistic that the community would find a solution to their livestock problems:

What I can see, for those people who like money, maybe they sell land to get money, they will sell all of this land and that will be the end of livestock for this area, but maybe I don't think that one will happen, very soon, we are going to get a solution, and our livestock will remain, yeah (Individual Interview #6).

## CHAPTER FIVE – Conclusions

In this chapter I summarize my findings and relate them to my research goal and objectives and to prior research. Further, I discuss the implications of group ranch subdivision on traditional livestock herding and conservation and give some recommendations for potential conservation development projects.

### **Summary and Discussion**

The overall goal of this study was to describe how the subdivision and privatization of the communally owned and managed Mailua Group Ranch in southern Kenya has affected traditional livestock herding as a land use and affected the relationships between Maasai livestock herding, open space, and wildlife. While the results of this study are particular only to this community, lessons may be learned that might apply to similar communities going through similar transformations.

Despite previous efforts to settle the Maasai, including the creation of group ranches, for the most part they have maintained much of their traditional livestock management practices until recently. Like many pastoral cultures throughout the world, Maasai pastoralism relied on seasonal movements in order to maximize access to forage and water sources. Maasai controlled livestock movement and access to seasonal grazing pastures through the leadership of traditional elders. The establishment of group ranches was an attempt by the Kenyan government to settle groups of Maasai and restrict

livestock movements to individual group ranches. In actuality, the Maasai in this community adapted much of their traditional ways to this new paradigm, and migrated beyond the group ranch boundaries during droughts.

Like the experience of pastoralist communities with rangeland privatization elsewhere in the world, the results of this study show that this process has brought many changes to the area and affected traditional livestock herding in many ways. Concerning social capital, the traditional systems and social networks of natural resource management have been altered by the process of privatization and subdivision. These changes have affected the ability of Maasai livestock herders to maintain the natural capital they have relied on to sustain their traditional livelihoods. This study provides new insights into how livestock herders are adapting to privatization and how subdivision is affecting traditional decision-making and social interactions regarding natural resource management and the ability to adapt to a changing climate.

#### Research Objective One – Subdivision Effects on Livestock Management and Responses to Seasonal Constraints

By subdividing Mailua Group Ranch into individual parcels and giving title of these lands to individual landowners, individual households are now settled across the landscape. Previous research suggested that livestock herding would decline as a result of subdivision (Boone et al., 2005; Seno & Shaw, 2002; Thornton, et al. 2006). This is evident in Mailua because migrating to seasonal pastures is no longer feasible for many Maasai livestock

herders; they are restricted to their own plots of land. This is similar to the experience of pastoralists in China where rangeland privatization restricted the mobility and flexibility relied on for centuries (Ning & Richard, 1999).

Subdivision has also resulted in the loss of communal areas reserved for different types and age classes of animals and for use during dry seasons and droughts. Before subdivision, households were clustered in traditional Manyattas; households are now spread across the landscape and most of the land is grazed throughout the year. This can have negative consequences for productivity in semi-arid landscapes like Kenya. In the semi-arid rangelands of Namibia, researchers have shown that replacing the temporally and spatially heterogeneous grazing patterns associated with traditional pastoralism with homogenous permanent grazing negatively effects the amount of forage and quality of pastures (Muller, Lindstadter, Frank, Bollig, & Wissel, 2007).

Because of these changes, many livestock herders believe subdivision has made it more difficult for livestock to negotiate dry seasons and survive droughts. This corresponds with previous research in other Maasai communities that showed a lack of adequate dry season pasture following group ranch subdivision (Kimani & Pickard, 1998; Rutten, 1992). Similarly, in Uganda, the loss of communal land tenure as a result of rangeland privatization has made livestock herders more susceptible to risks like drought. Okello & Kiringe (2004) and Seno & Shaw (2002) predicted that subdivision would result in trespassing into protected areas by livestock herders in search of grazing land. Some livestock herders in this community, during recent

droughts, have been forced to move their livestock far in search of pasture, even trespassing into national parks.

Access to water is difficult for many because water points are few and far between. Travel tends to be restricted to communal routes that have little or no grazing potential for animals. Pastoral communities in China have faced similar challenges accessing water for livestock following rangeland privatization (Zhaoli, 2005).

Boone et al. (2008) and Thornton et al. (2006) predicted that subdivision would result in the decline of livestock numbers for individual households. In Mailua, it is difficult for many Maasai to keep enough cattle to meet their needs. As a result many livestock herders are commercializing their herds by crossbreeding their livestock with exotic breeds. By doing so, they hope to have fewer, but larger animals that can produce more milk and meat and bring more money at markets. This corresponds with research in other group ranches in Kenya and elsewhere in Africa where new landowners sought to intensify livestock production through crossbreeding (Burnsilver & Mwangi, 2007; Kisamba-Mugerwa, et al. 2006; Rutten, 1992). Crossbreeding is occurring despite the fact that Maasai elsewhere in Kenya have shown concern that crossbred animals do not migrate as well as the local breeds, need more grass, and are harder to keep standing when they are weakened by drought (Burnsilver & Mwangi, 2007).

### Research Object Two – Subdivision Effects on Decision-Making Processes of Maasai Livestock Herders

Subdivision has brought an end to communal decision-making and traditional sharing mechanisms. Elders no longer have jurisdiction over land and grazing resources. Individuals now make many of the decisions about where and when to graze but only for their individual plots of land. For many, the sense of community and security that comes with living together in traditional manyattas is gone as a result of subdivision. This corresponds to the experience of pastoral communities in China where livestock herders are no longer secure now that people are scattered across the landscape (Zhaoli et al., 2005) and traditional social systems associated with nomadic pastoralism are threatened by privatization policies that ignore the connections between culture and the land (Ning & Richard, 1999). When American Indian reservations in the United States were privatized in the 1800s, Indians were forced to settle and abandon their traditional way of life (Kennedy, 1977; Meyer 1999). Traditional sharing mechanisms in Mailua are now threatened by conflicts over boundaries and trespassing between individual landowners and adjacent Maasai communities as a result of subdivision. Previous research in Uganda found similar conflicts were a result of rangeland privatization (Kisamba-Mugerwa et al., 2006).

### Research Objective Three – Subdivision Effects on Maasai Social Networks and Cooperation Regarding Natural Resource Management

Because individual households are settled across the landscape on individually owned plots traditional sharing mechanisms in Mailua are

threatened by conflicts over boundaries and trespassing between individual landowners. Subdivision has also made it difficult for livestock herders in this community to share grazing land with Maasai living in adjacent group ranches in Kenya and Maasai across the border in Tanzania. That many of the individual Maasai landowners have yet to fence their individual plots of land corresponds with previous research in other subdivided group ranches (Kimani & Pickard, 1998; Rutten, 1992) as well as research with pastoralists in China (Zhaoli et al., 2005). However, in response to subdivision many landowners have realized the need to share access to grazing land and water resources in order to continue keeping livestock. Specifically, in some areas landowners and neighbors are pooling their lands and managing them together. These pasture sharing agreements are usually based on preexisting friendships and kinships. Some landowners with few livestock are leasing their pastures to other, wealthier landowners and in some areas, landowners are working together to develop and maintain water sources for both domestic and livestock use. Similar pasture sharing agreements and cooperative development have occurred in other subdivided group ranches elsewhere in Kenya and among pastoralists in China (Burnsilver & Mwangi, 2007; Mwangi, 2007b; Ning & Richard, 1999; Zhaoli et al., 2005).

Some landowners in Mailua have sold their land to other Maasai as well as to non-Maasai. Many Maasai landowners are concerned that there are few opportunities besides livestock herding and when people sell land they will become poor and unemployed. Further, when non-Maasai buy land they bring

a different culture, put up fences, and engage in other land uses that make the land unavailable for livestock grazing. Previous research on the effects of subdivision in other Maasai group ranches warned of the consequences of selling land and the changes to the land brought by non-Maasai purchasers (Galaty, 1992; Kimani & Pickard, 1998; Rutten, 1992).

Similarly, in the western United States, an influx of new landowners and reductions in parcel sizes due to subdivision have altered social and biological landscapes previously dominated by large working cattle ranches (Theobald et al., 1996; Yung & Belsky, 2007). In the high mountain valleys of the Rocky Mountains of Colorado these processes have reduced ranching operations, created conflict between new and old landowners over trespassing and access to lands, and disrupted the movement of livestock between seasonal pastures (Theobald et al., 1996). In Montana, the established cooperative customs of ranchers have been altered by the influx of new landowners who inadvertently or intentionally challenged these customs, resulting in tensions between neighbors (Yung & Belsky, 2007).

As a result of the privatization of American Indian reservations in the United States during the 1800s, the reservations were fragmented and, because of the difficulties involved in the transition to private land, many Indian-owned land parcels were sold or leased to non-Indians. In one particular case, by 1895, ninety-percent of the arable land on the Umatilla Reservation in Oregon was being farmed by non-Indians and much of the best farmland on Indian reservations is still owned or managed today by non-

Indians (Kennedy, 1977). On some reservations, fragmentation and loss of lands due to privatization policies hindered future development and economic opportunities (Carlson, 1983; Kennedy, 1977; Meyer 1999).

#### Subdivision Effects on the Landscape and Future Opportunities for Conservation and Development

Some landowners are engaging in cultivation and charcoal burning as alternative sources of income. In some cases, landowners are using the smaller parcels of land that were intended for irrigated to supplement pastures on their larger ranches. Clearing land for cultivation and charcoal burning combined with sedentary grazing has changed the landscape and negatively affected livestock herding opportunities and wildlife habitat. Research conducted elsewhere in other subdivided group ranches showed a similar trend where rangeland privatization has resulted in the destruction of land cover due to an increase in cultivation (Homewood, 2004). In China, rangeland privatization has resulted in similar environmental degradation due to overstocking of livestock and the expansion of agriculture into grazing lands (Ning & Richard, 1999; Williams, 1996) and, in Uganda, rangeland privatization has failed to limit livestock numbers and has not reduced environmental degradation (Kisamba-Mugerwa et al., 2006). Charcoal making in Kenya may have implications for climate change. In addition to the observed effects on the landscape, charcoal making is an important source of greenhouse gases and other air pollutants (Pennise, Smith, Kithinji, Rezende, Zhang, & Fan, 2001). In semi-arid landscapes vegetation dynamics may

impact rainfall patterns (Wang & Elthahir, 2000) and tropical deforestation can reduce evapotranspiration and precipitation and result in longer dry seasons (Shukla, Nobre, & Sellers, 1990).

Some researchers predicted that subdivision would sever and fragment wildlife migration corridors as individual landowners develop their plots of land (Okello, 2005; Okello & Kiringe, 2004; Seno & Shaw, 2003). Research conducted elsewhere in Kenya found that subdivision has interfered with wildlife migration routes and reduced the size of wildlife dispersal areas (Wayumba & Mwenda, 2006) and resulted in the destruction of land cover and declining wildlife populations (Homewood, 2004). Before Mailua Group Ranch was subdivided, households were clustered in traditional manyattas and wildlife had access to large tracts of habitat free of human settlement. Because individual households are now scattered across the landscape, livestock herders report that wildlife/human interactions have increased and, in some cases, wildlife are no longer present in great numbers. Landowners complain about increased competition between livestock and wildlife and also wildlife damage to water sources. Attitudes about wildlife have changed because of this competition. Wildlife habitat is further threatened by the practice of charcoal burning, cultivation, sedentary grazing, and fencing of plots by non-Maasai landowners. Similar effects of rangeland privatization on wildlife habitat and migrations have occurred in China because of the introduction of year-round grazing in traditional seasonal pastures and fencing of rangelands (Zhaoli & Ning, 2005).

Another factor identified by community members as contributing to the difficulties brought about by subdivision is climate change. Many landowners claim that in their lifetimes rainfall patterns have changed and droughts are becoming more frequent and lasting longer. While rainfall patterns in Kenya's interior are typically highly variable, mean annual rainfall has been decreasing over the last half century and the recent droughts in 2000-2001 and 2006 are considered the worst in 60 years (Orindi, Nyong, & Herrero, 2007). Some have speculated that consecutive failures of rainy seasons in the last two decades are an early sign of climate change in the region (Orindi, Nyong, & Herrero, 2007). According to climate change projections, the frequency and intensity of droughts are expected to increase in Kenya, largely because of failed rainy seasons (Osbaahr & Viner, 2006). Many landowners claim that subdivision has made it more difficult to adapt to changes in the climate including longer droughts and unpredictable rainfall patterns. According to Boone (2007), if climate change results in precipitation declines and greater variability, livestock populations may become more sensitive to the fragmentation caused by land subdivision. Temperatures in southern Kenya are increasing (Altman, Alberts, Altman, & Roy, 2002). Warming temperatures and extreme weather conditions including droughts and floods due to climate change may threaten dryland cropping and livestock production in Africa (Kurukulasuriya et al., 2006; Van den Bossche & Coetzer, 2008). Further, climate changes may affect the quality and quantity of forage and water and alter the distribution of livestock diseases.

### Future of Maasai Traditions and Livestock Herding in Mailua

While livestock herding remains an important part of local livelihoods, it is difficult for livestock herding to meet the needs of a growing human population; placing limits on livestock numbers because of subdivision makes it even more difficult. Additionally, with subdivision, inheritance is an issue because the parcels of land children inherit may be too small to support livestock herding. The privatization of American Indian reservations in the United States during the 1800s led to situations where, after a landowner died, land was divided among heirs. This resulted in a situation where small plots of land had many owners and some individuals owned small parcels of land scattered across the land (Carlson, 1983). Many Indians did not have the capital to consolidate their land holdings and as a result, some of these lands were sold to non-Indians.

### **Implications for Traditional Livestock Herding and Conservation**

The subdivision and privatization of Maasai group ranches like Mailua may represent the greatest change for traditional Maasai pastoralism since Kenya was first colonized by the British in the late 1900s. According to Salzman (2004) pastoralism is based on the ability of livestock herders to move their livestock in search of pasture and water sources while steering clear of diseases, predators, and human habitation. By settling the Maasai on individually owned plots of land, restricting their ability to move livestock across the landscape, and putting them in constant competition with wildlife, subdivision may signal the end of traditional pastoralism in this community.

This has implications not only for the well-being of the Maasai but also for the wildlife that share these lands. Traditional pastoralism evolved as an efficient land use in the dry arid and semi-arid rangelands of southern Kenya (Fratkin, 1994) and was compatible with wildlife conservation (Berger, 1993; Boyd et al., 1999; Okello, 2005; Wayumba & Mwenda, 2006) because both wildlife and the Maasai relied on the open range (Akama, 1998; Galaty, 1992; Ogolla & Mugabe, 1996; Western et al., 2006; Seno & Shaw, 2002).

Despite subdivision, culturally and economically, livestock remains a major component of the Maasai way of life in this community. Many livestock herders have not fenced their lands and are working together through pasture sharing agreements and the development of community-based wildlife conservation projects. These strategies may not only maintain and protect the open spaces for livestock but can benefit wildlife as well. The case of Mailua provides another example of the persistence and adaptive abilities of pastoral communities in the face of major changes like group ranch subdivision (see Burnsilver & Mwangi, 2007).

While subdivision has resulted in secure land tenure for many of the Maasai by giving them title to their individual ranches, this has been undermined by the selling of land to outsiders. Another predicted benefit of subdivision was to help individual Maasai landowners access loans (Rutten, 1992). However, the ability to pay back loans is difficult when drought results in livestock losses. Developments like charcoal production and cultivation, the loss of communal regulation, and in-migration of non-Maasai landowners

following the subdivision of the group ranch have fragmented the social and biological landscapes that the Maasai have traditionally relied on for subsistence. While cultivation may provide some landowners with alternative income sources, the lack of adequate rainfall (Thornton et al., 2006) and time and resources to put into another land use may limit the effectiveness of cultivation for many. That many livestock herders are crossbreeding their cattle with exotic breeds despite the concerns of Maasai elsewhere, may indicate the seriousness of the effects of subdivision on traditional livestock production.

The alienation of Indian land and resources in the United States due in part to the privatization of reservation lands beginning in the 1800s has had long term effects on the economic opportunities of tribal members (Carlson, 1983; Kennedy, 1977; Meyer, 1999). In order to spare the Maasai from a similar future, efforts that encourage Maasai landowners to maintain ownership of their lands should be promoted. By working together and embracing new opportunities including community-based wildlife conservation project and livestock development, landowners may be able to prevent the loss of the open rangelands they need to survive as pastoralists. Past development policies have failed to recognize the important cultural adaptations of the Maasai to the semi-arid landscapes of southern Kenya. Any new policies for development in the semi-arid rangelands of Kenya should promote traditional pastoral strategies instead of limiting them (Ellis & Swift, 1988).

## **Recommendations and Conservation Opportunities**

The subdivision of Mailua presents both challenges and opportunities for conservation in this community. With private tenure over individual plots of land, landowners are free to sell their lands and alter the landscape through cultivation, charcoal burning, sedentary grazing, and fencing. However, unlike the previous group ranch structure, individual landowners are in a position to benefit directly from conservation. For example, many individual Maasai landowners living in the Kitengela wildlife dispersal area south of Nairobi National Park receive payments through the Wildlife Conservation Lease Program started in 2000 (Radeny, Nkedianye, Kristjanson, & Herrero, 2006). The program is designed to protect open space and ensure the migration of wildlife throughout the Athi-Kaputiei Plains (Reid et al., 2006 as cited in Radeny et al., 2006). Landowners participating in the program are paid 300 Kenyan shillings per acre (\$3.75 in 2005). Payments are distributed in three installments to coincide when school fees are due. In exchange landowners agree not to fence and subdivide their land, to tolerate the movement of wildlife on their land, to abstain from poaching, and to report incidences of poaching. According to Nkedianye (2004) participating landowners send their children to school, and are more likely to have positive attitudes concerning wildlife and open space and to share their land with wildlife than nonparticipants (as cited in Radeny et al., 2006). Further, the program reduces the need to sell land in order to pay school fees.

Many landowners in Mailua are optimistic about the creation of a community-owned and managed wildlife conservation and dry season grazing area. This bodes well for NGOs like SORALO that are working with the community to develop community-based conservation projects. The successful creation of a wildlife conservation area would not only benefit wildlife but could also benefit livestock herders if the area set aside was made available to livestock herders during dry seasons. This approach has been successful in other parts of Kenya where portions of Maasai group ranches have been set aside for wildlife conservation (Nightingale & Western, 2006). Gadd (2005) suggested that in areas where agriculture is an unsustainable land use, pastoralism should be promoted through holistic land-use planning and financial incentives in order to protect valuable wildlife habitat. This could be done in communities like the former Mailua Group Ranch in Kenya by adapting the concept of grassbanks where land has been set aside for wildlife conservation and dry season grazing areas. Grassbanking is the exchange of grazing forage for conservation benefits. Specifically,

The term grassbank is used to describe the practice where a private individual, nonprofit, or government entity, provides forage at a discounted rate to a rancher in need of alternative forage because the organization's and rancher's desire to conduct conservation work requires cattle to be removed from their usual foraging areas for an extended period of time. Forage can be traded for a variety of treatments, such as prescribed fire, mechanical thinning, and invasive weed control, which lead to conservation benefits (Gripne, 2005, pp. 3-4).

In exchange for utilization of the community conservation area for grazing, landowners could agree to terms similar to the Wildlife Conservation

Lease Program in Kitengela. In order to ensure the maintenance and availability of open space for both livestock and wildlife across the landscape, the receipt of financial benefits derived from community-owned and managed tourism enterprises could be distributed to landowners in exchange for not fencing or cultivating their land and allowing for the movement and presence of wildlife. Additionally, landowners could be encouraged to continue sharing grazing land and to allow livestock to pass directly to water sources. These conditions, combined with greater opportunities and support for intensifying livestock production through crossbreeding and necessary infrastructure development, could help ensure the continued viability of livestock herding as a land use for the Maasai by maintaining flexible access to open space. Boyd et al., (1999) suggested that such development could integrate livestock production and wildlife conservation and slow down agricultural development into wildlife and pastoral areas. In this way, wildlife conservation would be adapted to meet the needs of local people and they would be participating in wildlife conservation and receiving benefits. If successful, such a project in this area would meet the challenge of protecting land and biodiversity beyond national parks and meet the needs identified by Western (1989) for successful community-based conservation “by adapting philosophy and methodology to local conditions, whether cultural, economic, religious, or political” (p. 165).

### **Future Research**

Future research should address the economic and ecological potential of community-based natural resource management and wildlife conservation

in this community. Specific research should focus on the wildlife habitat potential of the group ranch and the proposed conservation area, as well as the potential economic benefits derived from the conservation area and associated ecotourism development. Additionally, this research should focus on the potential for such development to help alleviate some of the concerns about the effects of subdivision on livestock herding and local adaptations to climate change. Such research should coincide with the development of any projects and be participatory. Specifically, members of the community, including women, should be directly involved in the planning and development of any projects. They should be fully involved in any research activity regarding project development and implementation. When projects are developed, the community and any organizations involved should work together to develop long term monitoring programs. Programs should focus on the effects of conservation development on land use, local attitudes about wildlife, and the connections between conservation and livestock herding.

Pastoral communities like the Maasai should be encouraged to connect with other communities elsewhere in the world facing similar circumstances. In recent years cooperation between Maasai livestock herders in Kenya and ranchers in the southwestern United States has identified common issues and potential solutions faced by each community (Nightingale & Western, 2006). Such cooperation should be expanded to involve pastoral communities in Asia and throughout Africa.

## REFERENCES CITED

- Akama, J. S. (1998). The evolution of wildlife policies in Kenya. *Journal of Third World Studies*, 15(2), 102-117.
- Altman, J., Alberts, S.C., Altman, S.A., & Roy, S.B. (2002). Dramatic change in local climate patterns in the Amboseli basin, Kenya. *African Journal of Ecology*, 40, 248-251.
- Ashley, C., Elliot, J. & Boyd, C. (2003). *'Just Wildlife?' Or a source of local development?* (Natural Resources Perspectives No. 85). London: Overseas Development Institute.
- Bekure, S. & Ole Pasha, I. (1990). The response of Kenya Maasai to changing land policies. In: P.A. Olson (Ed.), *The Struggle for the Land: Indigenous Insight and Industrial Empire in the Semiarid World* (pp. 231-250). NE: University of Nebraska Press.
- Berg, B.L. (2004). *Qualitative Research Methods*. MA: Pearson Education, Inc.
- Berger, D.J. (1998). Property rights regimes and the management of resources. *Natural Resources Forum*, 22(4), 263-269.
- Bliss, J.C. & Martin, A.J. (1989). Identifying NIPF motivations with qualitative methods. *Forest Science*, 35(2), 601-622.
- Boone, R.B. (2007). Effects of fragmentation on cattle in African savannas under variable precipitation. *Landscape Ecology*, 22, 1355-1369.
- Boone, R.B., BurnSilver, S.B., Thornton, P.K., Worden, J.S., & Galvin, K.A. (2005). Quantifying declines in livestock due to land subdivision. *Rangeland Ecological Management*, 5, 523-532.
- Boyd, C., Blench, R., Bourn, D., Drake, L., & Stevenson, P. (1999). *Reconciling interests among wildlife, livestock, and people in Eastern Africa: A sustainable livelihoods approach* (Natural Resources Perspectives No. 45). London: Overseas Development Institute.
- Brady, N. & Weil, R. (1999). *Wildlife extension: participating conservation by the Maasai of Kenya*. Nairobi, Kenya: African Centre for Technology Studies.

- BurnSilver, S.B. & Mwangi, E. (2007). *Beyond group ranch subdivision: collective action for livestock mobility, ecological viability, and livelihoods* (CAPRI Working Paper, No. 66), Washington, DC: Consultative Group on International Agricultural Research.
- Carlson, L.A. (1983). Federal policy and Indian land: Economic interests and the sale of Indian allotments, 1900-1934. *Agricultural History*, 57(1), 33-45.
- Campbell, D.J., Gichohi, H., Mwangi, A., & Chege, L. (2000). Land use conflict in Kajiado District, Kenya. *Land Use Policy*, 17, 337-348.
- Coleman, J.S. (1990). *Foundations of social theory*. MA: The Belknap Press of Harvard University Press.
- Costanza, R. & Daly, H.E. (1992). Natural Capital and Sustainable Development. *Conservation Biology*, 6(1), 37-46.
- Cossins, N. (n.d.). *Production strategies and pastoral man*. Retrieved January 18, 2008, from the International Livestock Research Institute Web site: <http://www.ilri.org/InfoServ/Webpub/Fulldocs/X5542b/x5542b0d.htm#TopOfPage>
- Crabtree, B.F. & W.L. Miller. (1992). *Doing qualitative research*. CA: Sage Publications, Inc.
- Damiba, T.E. & Ables, E.D. (1994). Population characteristics and impacts on woody vegetation of Elephants on Nazinga Game Ranch, Burkina Faso. *Pachyderm* 18: 46-53.
- Doetinchem, N., & Crepin, C. (No Date). *Integrated Livestock-Wildlife Management*. In: *Agricultural Information Source Book (Module 5)*. Retrieved March 13, 2007, from the World Bank web site: <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTARD/EXTAGISOU/0,,contentMDK:20938777~pagePK:64168445~piPK:64168309~theSitePK:2502781,00.html>
- Ellis, J.E. & Swift, D.M. (1988). Stability of African pastoral ecosystems: Alternate paradigms and implications for development. *Journal of Range Management*, 41(6), 450-459.
- Esposito, N. (2001). From meaning to meaning: The influence of translation techniques on non-English focus group research. *Qualitative Health Research*, 11, 568-579.

- Fernandez-Gimenez, M. (1993). The role of ecological perception in indigenous resource management: A case study from the Mongolian forest-steppe. *Nomadic Peoples* 33, 31-46.
- Fernandez-Gimenez, M. (2000). The role of Mongolian nomadic pastoralists' ecological knowledge in rangeland management. *Ecological Applications*, 10(5), 1318-1326.
- Flyman, M.V. (2003). *Bridging the gap between livestock keeping and tourism in Ngamiland District, Botswana*. Gaborone, Botswana: Center for Tourism and Natural Resources Management.
- Fratkin, E. (1994). Pastoral land tenure in Kenya: Maasai, Samburu, Boran, and Rendille experiences, 1950-1990. *Nomadic Peoples*, 34/35, 55-68.
- Gadd, M.E. (2005). Conservation outside of parks: Attitudes of local people in Laikipia, Kenya. *Environmental Conservation*, 32(1), 50-63.
- Galaty, J.G. (1980). The Maasai Group Ranch: Politics and development in an African pastoral society. In P.C. Salzman (Ed.), *When nomads settle: Processes of sedentarization as adaptation and response*, (pp 157-171). New York: Praeger Publishers.
- Galaty, J.G. (1992). "The land is yours": Social and economic factors in the privatization, sub-division and sale of Maasai ranches. *Nomadic Peoples*, 30, 26-40.
- Glaser, B. & Strauss, A. (1967). *The discovery of grounded theory*. Ill: Aldine Transaction.
- Glesne, C. & Peshkin, A. (1992). *Becoming qualitative researchers: An introduction*. NY: Longman Publishing Group.
- Goldman, M. (2003). Partitioned nature, privileged knowledge: Community-based conservation in Tanzania. *Development and Change* 34(5), 833-862.
- Goodman, R. (2002). Pastoral livelihoods in Tanzania: Can the Maasai benefit from conservation? *Current Issues in Tourism*, 5, 280-86.
- Gripne, S.L. (2005). Grassbanks: An evaluation of a conservation tool. Doctoral Dissertation. University of Montana-Missoula.
- Groom, R. J. (2007). *How to make subdivision work: An analysis of the ecological and socio-economic factors affecting conservation outcomes during land privatization in Kenyan Maasailand*. Doctoral Dissertation, University of Bristol-Bristol, UK.

- Hackel, D.J. (1998). Community Conservation and the Future of Africa's Wildlife. *Conservation Biology*, 13(4), 726-734.
- Haugerud, A. (1989). Land tenure and agrarian change in Kenya. *Africa*, 59(1), 61-90.
- Homewood, K.M. (2004). Policy, environment and development in African rangelands. *Environmental Science and Policy*, 7, 125-143.
- Homewood, K.M., & Rodgers, W.A. (1984). Pastoralism and conservation. *Human Ecology*, 12(4), 431-441.
- Homewood, K., Lambin, E. F., Coast, E., Kariuki, A., Kikula, I., Kivelia, J., Said, M., Serneels, S. & Thompson, M. (2001). *Long-term changes in Serengeti-Mara wildebeest and land cover: Pastoralism, population, policies? PNAS* 98(22), 12544-12549.
- Honey, M.S. (1999). Treading lightly? Ecotourism's impact on the environment. *Environment*, 41(5), 4-9, 28-33.
- Kellert, S.R., Mehta, J.N., Ebbin, S.A., & Lichtenfeld, L.L. (2000). Community natural resource management: Promise, rhetoric, and reality. *Society and Natural Resources*, 13, 705-715.
- Kennedy, J.B. (1977). *The Umatilla Indian Reservation, 1855-1975: Factors contributing to a diminished land resource base*. Doctoral Dissertation, Oregon State University-Corvallis.
- Kimani, K. & Pickard, J. (1998). Recent trends and implications of group ranch sub-division and fragmentation in Kajiado District, Kenya. *The Geographical Journal*, 164(4), 202-213.
- Kisamba-Mugerwa, W., Pender, J., & Edward, K. (2006, April). *Impacts of individualization of land tenure on livestock and rangeland management in Southwestern Uganda*. Paper presented at the 11<sup>th</sup> Conference of the International Association for the Study of Common Property, Bali, Indonesia. Retrieved March 3, 2009, from the International Association for the Study of the Commons web site: [http://www.iascp.org/bali/papers/Kisamba\\_Mugerwa\\_W\\_Pender\\_Edward.pdf](http://www.iascp.org/bali/papers/Kisamba_Mugerwa_W_Pender_Edward.pdf)
- Kurukulasuriya, P., Mendelsohn, R., Hassan, R., Benhin, J., Deressa, T., Diop, M., et al. (2006). Will African agriculture survive climate change. *The World Bank Economic Review*, 20(3), 367-388.

- Nightingale, D.L. & Western, D. (2006). *The future of the open rangelands: An exchange of ideas between East Africa and the American Southwest*. Nairobi, Kenya: African Conservation Centre.
- Matampash, K. (1993). The Maasai of Kenya. In S.H. Davis (Ed.), *Indigenous Views of Land and the Environment* (World Bank Discussion Papers No. 188). Washington, D.C: The World Bank.
- Mearns, R. (1996, September). *When livestock are good for the environment: Benefit-sharing of environmental goods and services*. Invited special paper for the World Bank/FAO Workshop, 'Balancing Livestock and the Environment', Washington, DC. Retrieved March 3, 2009 from the Food and Agricultural Organization of the United Nations web site: <ftp://ftp.fao.org/docrep/nonfao/lead/x6184e/x6184e00.pdf>
- Meyer, M.L. (1999). *The White Earth tragedy: Ethnicity and dispossession at a Minnesota Anishinaabe reservation, 1889-1920*. NE: University of Nebraska Press.
- Mizutani, F. Muthiani, E., Kristjanson, P., & Recke, H. (2005). Impact and value of wildlife in pastoral production systems in Kenya: Possibilities for healthy ecosystem conservation and livestock development for the poor. In S.A. Osofsky (Ed.), *Conservation and development interventions at the wildlife/Livestock interface: Implications for wildlife, livestock, and human health* (Occasional paper of the IUCN Species Survival Commission No. 30). Cambridge, U.K: IUCN.
- Muller, B., Lindstadter, A., Frank, K., Bollig, M., & Wissel, C. (2007). Learning from local knowledge: Modeling the pastoral-nomadic range management of the Himba, Namibia. *Ecological Applications*, 17(2), 1857-1875.
- Mwangi, E. (2007a). The Puzzle of Group Ranch Subdivision in Kenya's Maasailand. *Development and Change*, 38(5), 889-910.
- Mwangi, E. (2007b). Subdividing the commons: Distributional conflict in the transition from collective to individual property rights in Kenya's Maasailand. *World Development*, 35(5), 815-834.
- Ning, W., & Richard, C. (1999, July). *The privatization process of rangeland and its impacts on pastoral dynamics in the Hindu-Kush Himalaya: The case of Western Sechuan, China*. Paper presented at the International Rangeland Congress, Townsville, Australia. Retrieved March 3, 2009 from the Eldis web site: <http://www.eldis.org/vfile/upload/1/document/0708/DOC9644.pdf>

- Ogolla, B.D. & Mugabe, J. (1996). Land tenure systems and natural resource management. In C. Juma, & J.B. Ojuwang (Eds.), *Land we trust: Environment, private property and constitutional change* (ACTS Environmental Policy Series No. 7). Nairobi, Kenya: Initiative Publishers.
- Osbahr, H. & Viner, D. (2006). *Linking climate change adaptation and disaster risk management for sustainable poverty reduction: Kenya Country Study Report*. Washington, D.C: Vulnerability and Adaptation Resource Group (VARG).
- Okello, M.M., (2005). Land use changes and human-wildlife conflicts in the Amboseli area, Kenya. *Human Dimensions of Wildlife*, 10, 19-28.
- Okello, M. M. & Kiringe, J.W. (2004). Threats to biodiversity and their implications in protected and adjacent dispersal areas of Kenya. *Journal of Sustainable Tourism*, 12(1), 55-69.
- Orindi, V.A., Nyong, A., & Herrero, M. (2007). Pastoral livelihood adaptation to drought and institutional interventions in Kenya. (Human Development Report Office Occasional Paper). New York: United Nations Human Develop Programme.
- Pennise D.M., Smith, K.R., Kithinji, J.P., Rezende, M.E., Zhang, J., & Fan, C. (2001). Emission of greenhouse gases and other airborne pollutants from charcoal making in Kenya and Brazil. *Journal of Geophysical Research-Atmosphere*, 106, 24143-24155.
- Putnam, R.D. (2000). *Bowling alone: The collapse and revival of american community*. NY: Simon & Schuster Paperbacks.
- Radeny, M., Nkedianye, D., Kristjanson, P., & Herrero, M. (2006, June). *Livelihood Choices and Returns among Agro-Pastoralists in southern Kenya*. Paper presented at Pastoralism and Poverty Reduction in East Africa: A Policy Research Conference, Nairobi, Kenya. Retrieved March 3, 2009, from the International Livestock Research Institute Web site: <http://www.ilri.org/Link/Publications/Publications/Theme%201/Pastoral%20conference/Papers/Radeny%20Det%20of%20Income%20Kitengela%20Submitted2.pdf>
- Reid, R.S., Thornton, P.K., & Kruska, R.L. (2004). Loss and fragmentation of habitat for pastoral people and wildlife in East Africa: Concepts and issues. *African Journal of Range and Forage Science*, 21(3), 171-181.
- Robson, C. (2003). *Real world research: A resource for social scientists and practitioner-researchers*. MA: Blackwell Publishers, Inc.

- Rutten, M.M. (1992) *Selling wealth to buy poverty: The process of individualization of land ownership among the Maasai pastoralists of Kajiado District, Kenya, 1890-1990*, (Nijmegen Studies in Development and Cultural Change, Vol. 10). Nijmegen: Catholic University.
- Salzman, P.F. (2004). *Pastoralists: Equality, Hierarchy, and the State*. CO: Westview Press.
- Sayre, N.F. (2004). Viewpoint: The need for qualitative research to understand ranch management. *Journal of Range Management*, 57, 668-674.
- Seno, S.K. & Shaw, W.W.. (2002). Land tenure policies: Maasai traditions and wildlife conservation in Kenya. *Society and Natural Resources*, 15, 79-88.
- Serneels, A. & Lambin, E.F. (2001). Proximate causes of land-use change in Narok District, Kenya: A spatial statistical model. *Agriculture, Ecosystems and Environment*, 85, 65-81.
- Shukla, J., Nobre, C., & Sellers, P. (1990). Amazon deforestation and climate change. *Science*, 247, 1322-1325.
- Sindiga, I. (1999). Alternative tourism and sustainable development in Kenya. *Journal of Sustainable Tourism*, 7(2), 108-127.
- Strauss, A. & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. CA: Sage Publications, Inc.
- Temple, B. & A. Young. (2004). Qualitative research and translation dilemmas. *Qualitative Research*, 4(2), 161-178.
- Theobald, D.M., Gosnell, H., & Riebsame, W.E. (1996). Land use and landscape change in the Colorado Mountains II: A case study of the East River Valley. *Mountain Research and Development*, 16(4), 407-418.
- Van den Bossche, P., & Coetzer, J.A.W. (2008). Climate change and animal health in Africa. *Rev. sc. tech. Off. Int. Epiz.*, 27(2), 551-562.
- Wang, G. & Eltahir, E.A.B. (2000). Role of vegetation dynamics in enhancing the low-frequency variability of the Sahel rainfall. *Water Resource Research*, 36, 1013-1021.

- Wayumba, R.N. & Mwenda, J.N. (2006, March). *The impact of Changing land tenure and land use on wildlife migration within group ranches in Kenya: A case study of the Amboseli Ecosystem*. Paper presented at Promoting Land Administration and Good Governance, 5<sup>th</sup> Annual Regional Conference, Accra, Ghana. Retrieved March 3, 2009 from the International Federation of Surveyors web site: [http://www.fig.net/pub/accra/papers/ts10/ts10\\_05\\_wayumba\\_mwenda.pdf](http://www.fig.net/pub/accra/papers/ts10/ts10_05_wayumba_mwenda.pdf)
- Western, D., Russell, S., & Mutu, K.. (2006, September). *The status of wildlife in Kenya's protected areas and non-protected areas*. Paper presented at the First Stakeholders Symposium of the Wildlife Policy and Legislative Review, Nairobi, Kenya. Retrieved March 3, 2009 from the African Conservation Centre web site: [http://www.conservationafrica.org/conservation-publications/wildlife\\_poicy\\_review\\_paper.pdf](http://www.conservationafrica.org/conservation-publications/wildlife_poicy_review_paper.pdf)
- Western, D. (1994). The background to community-based conservation. In D. Western & R.M. Wright (Eds.), *Natural Connections: Perspectives in Community Based Conservation*, (pp.1-14). Washington, DC: Island Press.
- Western, D. (1989). Conservation without parks: Wildlife in the rural landscape. In D. Western & M.C. Pearl (Eds.), *Conservation for the twentieth century*, (pp 158-165). Oxford: Oxford University Press.
- Williams, D.M. (1996). *Grassland enclosures: Catalyst of land degradation in Inner Mongolia*. *Human Organization*, 55(3), 307-313.
- Wishitemi, B.E.L. & Okello, M.M. (2003). Application of the protected landscape model in southern Kenya. *Parks*, 13(2), 12-21.
- Worden, J.S. (2007). *Fragmentation and settlement patter in Maasailand – Implications for pastoral mobility, drought vulnerability, and wildlife conservation in an East African Savanna*. Doctoral Dissertation, Colorado State University-Fort Collins.
- Yin, R.K. (2003). *Case study research; Design and Methods*. CA: Sage Publications, Inc.
- Yung, Y. & Belsky, J.M. (2007). Private property rights and community goods: Negotiating landowner cooperation amidst changing ownership on the Rocky Mountain Front. *Society & Natural Resources* 20(8), 689-703.
- Zhaoli, Y., Ning, W., Dorji, Y., & Jia, R. (2005). A review of rangeland privatisation and its implications in the Tibetan Plateau, China. *Nomadic Peoples*, 9(1-2), 31-51.
- Zhaoli, Y. & Ning, W. (2005). Rangeland privatization and its impacts on the Zoige wetlands on the Eastern Tibetan Plateau. *Journal of Mountain Science*, 2(2), 105-115.

## APPENDIX A – Interview Guide

1. Please describe your area.
2. Please describe your livelihood strategy(ies).
3. Why do you own livestock?
4. What is the role of livestock herding in this area?
5. What if any, changes have you noticed, or are you noticing in your community?
  - Landscape changes
  - Etc.
6. Are you currently cooperating with others for livestock management purposes? If so, how?
7. Has subdivision affected livestock herding in your community? If so, how?
  - Water access?
  - Dry Season grazing?
  - Drought? (2005 as compared to past drought)
  - Etc.
8. Has subdivision affected the way you can respond during times of drought? If so, how?
9. Has subdivision affected the way livestock herding decisions are made? If so, how?
10. Has subdivision affected the way you interact with other members of your community, in terms of managing livestock? What about with other communities? Sections, group ranches, etc.
11. What types of things have you done to in response to subdivision in terms of livestock management? What about your community?
12. Has your view of subdivision changed over the years? If so, how?
13. How do you feel about changing land ownership in your area?

14. Do you have any ideas for managing land in your area in a way that will make certain there is enough land, forage, and water available for both wildlife and livestock?
15. What do you think the future looks like for livestock herding and the Maasai in this area?