

**DETERMINANTS OF CHOICE OF SUSTAINABILITY STRATEGIES ADOPTED
BY GROUP RANCHES IN SAMBURU COUNTY, KENYA**

BY

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DECLARATION

This is my original work and has not been presented for the award of a degree in any other University or for any other award.

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We confirm that the work reported in this thesis was carried out by the candidate under our supervision and has been submitted with our approval as University supervisors.

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DEDICATION

To My beloved Liana Family

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ABBREVIATION AND ACRONYMS

ACTS	African Centre for Technology Studies
ASALs	Arid and Semi-arid lands
CBO	Community-Based Organizations
CLASO	County Land Adjudication/Settlement Officer
ELCI	Environment Liaison Centre International
EU	European Union
FAO	Food Agriculture Organization
GDP	Gross Domestic Product
IDMC	Internal Displacement Monitoring Centre
KLDP	Kenya Livestock Development Project
KEMU	Kenya Methodist University
KPHC	Kenya Population and Housing Census
MoLHUD	Ministry of Land, Housing and Urban Development
MoLPP	Ministry of Lands and Physical Planning
NACOSTI	National Commission For Science, Technology and Innovation
NGOs	Non-Government Organizations
NLC	National Land Commission
SPSS	Statistical Package for Social Sciences
UNDP	United Nations Development Program
USAID	United States Agency for International Development

ABSTRACT

The purpose of this study was to identify, analyze and document determinants of the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. The concept of group ranches was introduced in Kenya to promote commercial ranching and to recognize, protect and register communal land rights. About five hundred, thirty nine group ranches were established. However, most of them dissolved and subdivided into individual land holdings within a short period. Numerous studies have been conducted on the establishment of group ranches, their dissolution and coping strategies. However, the aspect of sustainability and the choice of sustainability strategies adopted by group ranches have received little attention in these studies. This study visualized environmental, organizational, management and societal characteristics as the independent variables while the choice of sustainability strategies was the dependent variable. The general objective of the study was to examine determinants of the choice of sustainability strategies adopted by the group ranches in Samburu County, Kenya. The specific objectives were to: establish environmental characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County; assess organizational characteristics determining the choice of sustainability strategies adopted by the group ranches in Samburu County; identify societal characteristics determining the choice of sustainability strategies adopted by the group ranches in Samburu County and to find out management characteristics determining the choice of sustainability strategies adopted by the group ranches in Samburu County. The study adopted a descriptive survey research design employing the use of questionnaires, key informant interviews, focus group discussions and observation as primary data collection methods. The target population for the study was the 16,611 registered members in the 38 group ranches spread out in the County. The study sampled twelve group ranches with approximately 5,643 members from which 374 respondents were systematically sampled. Purposive sampling was used to select key informants and participants in the focus group discussions. The study adopted the multi-linear regression model to establish the relationship between variables. The study was guided by three theories: the Tragedy of the Commons Theory, Resource-Based View Theory and the Theory of Sustainable Livelihood. The research procedure began with a pilot study that was conducted to test the validity and reliability of the research instruments. Adjustments and recommendations from the pilot study were incorporated into the research instruments. The study found out that environmental, organizational, management and societal characteristics influenced the choice of sustainability strategies adopted by the group ranches in Samburu County to a great extent. The study established that the past experiences were the most significant factor influencing the choice of sustainability strategies, with a regression coefficient of 0.432. The Analysis of Variance (ANOVA) was used to test the hypotheses and p-values of 0.000 were obtained. The study concludes that environmental, organizational, societal and management factors determine the choice of sustainability strategies adopted by the group ranches in Samburu County. The study recommends consideration and integration of environmental, organizational, societal and management factors when formulating policies affecting the group ranches. The study also recommends change in the policy to allow individual land ownership within a group ranch without necessarily dissolving the group ranches.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Ranching refers to livestock production system on extensive landholdings and occurs mostly in the rangelands where rain-fed crop production is limited due to unfavourable climatic conditions (Huho, Ngaira & Ogindo, 2010; Hatfield & Davies, 2006). Ranching is the dominant land-use in the arid and semi-arid areas of the world with considerable cultural, economic and ecological importance attributed to it. It is also a lifestyle that majority of the people living in the rangelands cannot afford to stay without (Hussey, 2010).

About 40 per cent of the landmass in America has been classified as rangelands and 70 per cent of the landmass in Australia is also arid and semi-arid. Due to environmental challenges facing these rangelands, ranching is the dominant land use. In Africa, the arid and semi-arid lands occupy about 43 per cent of the continent's land mass. In Eastern Africa, the rangelands occupy about 70 per cent of landmass. In Kenya, they occupy about 80 per cent of the landmass and are suitable for ranching (Hoffman & Vogel, 2008).

Due to its importance, ranching is practised by over 200 million people worldwide (United Nations Environment Programme [UNEP], 2015) and it remains the best sustainable livestock production system in the semi-arid and arid lands (ASALs) of Kenya, particularly in the Counties of Samburu, Mandera, Garissa, Wajir, Tana River, Marsabit, Isiolo, Turkana, West Pokot, Baringo, Kajiado, Narok, Laikipia and Samburu Counties (Kipainoi, 2013; Huho, 2011). Therefore, sustained ranching is critical in improving the standards of living of the ranching communities and for

enhancing economic growth in the economies where ranching is practiced (Ntiati, 2002).

Arising from increased global challenges of climate change leading to scarcity of water, rapid population growth, climate change and increased demand for livestock products, much attention has been paid to the recognition, protection and registration of land rights in the rangelands worldwide (United States Agency for International Development [USAID], 2011). Land is an important factor of production and forms the basis for food production and income generation. It serves as collateral for credit and is a means of holding savings for the future. Land is also a social asset that is a key to social status, political power, cultural identity as well as being a determining factor for one to participate in land matters (National Land Commission Strategic Plan, 2013-2018).

Therefore, ownership of land is significant for economic, social, cultural and political development of many economies the world over (Chen & Summerfield, 2007). Due to slow rate of land registration, it has become difficult for people living in the rangelands to make long-term and sustainable improvements on the land whose security of tenure has not been recognized, protected and registered (Wayumba, 2013). Thus, ownership and sustainable utilization of land in the rangelands is critical for the broader economic growth and poverty reduction especially in developing Countries (Constitution of Kenya, 2010; Kibugi, 2008).

In the pre-colonial period, land in the rangelands of Africa was abundant and the main economic activity was livestock production. Land was held as a trans- generational asset whose management was at different levels of the social organizational structure (Karodia, Soni, Bayat, & Soni, 2013). Its access and control depended on an

individual's place in the social order of the community. The more land an individual person had, the more prestigious he was in the society. Since then, land tenure and its management have undergone an evolutionary transformation with individualization and privatization of land becoming increasingly common in the rangelands (Lesorogol, 2008; Mwangi, 2007a). As Borwein (2013) observed group ranches were established as a form of collective land ownership to privatize communal land in the rangelands.

Before colonization, land in Kenya belonged to the whole community and its access, control and management depended on the customs and practices of the particular communities (Wachira, 2008). Communities living in the rangelands, particularly the pastoralists, such as the Samburu, Maasai and the Borana preferred communal land ownership where every person in the community had rights of access to the land. This type of land ownership ensured free movement of livestock in search of water and pasture (Mwakima, 2013).

During the colonial period in Kenya, the colonial government restricted herders from moving freely with their livestock and forced them to practice sedentary agriculture. However, the policy resulted into further deterioration of the rangelands due to overgrazing. To counter the effects of overgrazing, the government ordered for reduction in the number of livestock that each household kept. However, the destocking policy was soon abandoned after it met resistance from the pastoralists (USAID, 2011).

In 1945, the government set up the African Resettlement Board which was later replaced by the African Land Development Board (ALDEV), a ten year development plan (1945-1955) to address land degradation in the rangelands. Grazing schemes

were introduced and given the necessary support by various government projects which included disease control and construction of boreholes within the grazing schemes. However, establishment of grazing schemes did not stop the pastoralists from migration with their animals. They were unable to keep within the confines of the grazing schemes and continued moving outside in search of water and pasture during the dry periods. This made the government suspend the programme for it had proved expensive to manage (Veit, 2011).

In 1955, the “Swynnerton” plan (1954-59) established a new land-use policy which sought to formalize land rights of African farmers in high potential agricultural areas and support communal grazing in the rangelands. The policy aimed to reduce land degradation in the arid and semi-arid lands, and to make them more productive. Since the government viewed deterioration of the rangelands as a consequence of overstocking and overgrazing, grazing schemes were re-established whereby stock migration was restricted, water was provided through construction of boreholes and dams, and diseases were controlled. However, by the early 1960s, most schemes had been abandoned due to the challenges resulting from harsh climatic conditions which made restriction on livestock difficult (Veit, 2011).

After independence, land adjudication process commenced and land in Kenya was privatized. This privatization of land in Kenya made the post-colonial government establish group ranches in the Arid and Semi-Arid parts of the Country under the Kenya Livestock Development Project (Baumann, 2011). The government had realized that the ecology of the rangelands favoured communal land ownership in form of group ranches instead of individual land ownership (Moiko, 2011). Communal land ownership in the rangelands was more appropriate as it allowed

migration of livestock within group ranches and to the neighbours for pasturage that was a critical coping strategy against unreliable rainfall patterns, extreme temperatures, droughts and diseases (Mule, 2010).

The group ranches were established in areas where land adjudication process had started and they were the means through which community land previously held by the defunct county councils was adjudicated and registered to the members (Odari, 2010; Lesorogol, 2008). The group ranches contributed about 10 per cent of Kenya's Gross Domestic Product (GDP) and were a critical source of economic activity in the dry areas of Kenya where rain-fed agriculture was hardly practised (Fratkin, 2001). Kenya's livestock production system accounts for 24 per cent of the total agricultural output and is worth about US\$800 million per year.

In Samburu County, group ranches were the main sources of livelihood as they provided for about 90 per cent of employment and more than 95 per cent of family incomes (Food and Agriculture Organization [FAO], 2005). Besides being the main source of income, group ranching also provided livestock that was used for cultural and religious roles like dowry payment as well as being symbols of prosperity and prestige (Noor, Guliye, Tariq & Bebe, 2013).

However, by the 1980s, most of the group ranches formed in the late 1960s and early 1970s had dissolved and sub-divided into very small land units that were not ecologically and economically viable for livestock production system (Mule, 2010). This coupled with mismanagement practices, left members staring at what Masharen (2015) referred to as economic ruin, thus raising questions about the future of group ranches in Kenya (Gaitho, 2014; Veit, 2011). Nevertheless, the group ranches that resisted the temptation to dissolve and sub-divide adopted sustainable strategies such

as income generating activities, partnerships, investments in the community wellbeing and leasing of land to private developers for sustainability (Kipainoi, 2013).

In Samburu County, Kenya, demarcation and survey of land started in the early 1970s (Ministry of Lands and Physical Planning [MoLPP], 2016). Initially, the communities living in the County were opposed to the land adjudication process and formation of group ranches but later on the desire to own land communally grew and forty-two group ranches were formed (Lesogorol, 2008). Nevertheless, due to increase in human population, land degradation, insecurity and mismanagement, pressure to dissolve and sub-divide group ranches in Samburu County grew ushering in a scenario that would not support ranching (United Nations Development Programme [UNDP], 2005). Thus striking a balance between satisfying livelihood needs of the members and giving in to pressure to dissolve and sub-divide was the biggest challenge facing group ranches in the County (Mwakima, 2013). The group ranch officials had to devise subtle ways to convince the members to abandon pressure to dissolve group ranches.

In Samburu County, group ranch officials succeeded in convincing the members to abandon the pressure to dissolve and crafted sustainability strategies that held the group ranches together in order to improve the livelihoods of the members. During this time, group ranches in other parts of Kenya, particularly Kajiado and Narok Counties had dissolved and subdivided into small land holdings. Since today's success does not guarantee tomorrow's success (Thompson, Strickland & Gamble, 2010), group ranches should operate like business enterprises whereby the resources are optimally utilized. Similarly, the management of group ranches should always scan the environment in which they operate and craft strategies to sustain ranching. As Thompson et al. (2010) argue, executing a sustainable strategy is primarily an

operations-driven activity that is tougher and more time consuming than crafting the same strategy. The best crafted strategies are of little value if they are not effectively and efficiently implemented. However, the degree of implementation is dependent on the choice of strategies. For instance, there could be several strategies at the disposal of a group ranch, but their sustainability will depend on the appropriateness of the choices made. Making the right choice for sustainability strategies of group ranches is crucial if they should remain in business (Gomez-Mejia & Balkin, 2002).

The study was formulated to establish sustainability of group ranches in Kenya by examining determinants of choice of sustainability strategies adopted by group ranches in Samburu County. However, the study did not address sustainability of private and co-operative ranches that are managed differently.

1.2 Statement of the Problem

The group ranch model of land ownership and livestock production was introduced in the rangelands of Kenya in the late 1960s and early 1970s to promote commercial ranching, recognize, protect and register communal land rights. The drive to form group ranches in the rangelands arose from increased individualization of land in the Central and Western regions of Kenya (Gaitho, 2014). Thus, communities living in the rangelands sought for the demarcation and survey of their land. Subsequently about five hundred, thirty nine (539) group ranches were established in Kenya, with a membership of 297,438 covering an approximate area of 4,336,657 hectares (MoLPP, 2016).

However, most of the group ranches formed in the late 1960s and early 1970s in Narok, Kajiado, Baringo and West Pokot Counties of Kenya dissolved and subdivided

within a short period leading to individual land holdings. The choice to dissolve and subdivide ranches into small landholding in these fragile ecosystems was inappropriate, unviable and uneconomical (Kipainoi, 2013).

In Samburu County, four out of forty-two group ranches established in 1970 dissolved and subdivided. The remaining thirty-eight group ranches were under pressure to subdivide and their future seemed uncertain (Lesogorol, 2008). Numerous studies have been conducted on the establishment of group ranches, their dissolution and coping strategies. However, the aspect of sustainability and choice of sustainability strategies applied by ranches has received little attention in these studies. The purpose of this study was to investigate the factors that influence choice of sustainability strategies adopted by group ranches in Samburu County, Kenya.

1.3 General Objective

The general objective of the study was to examine the determinants of the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya.

1.4 Specific Objectives

Specific objectives were to:

- i). Establish environmental characteristics determining choice of sustainability strategies adopted by group ranches in Samburu County, Kenya;
- ii). Assess organizational characteristics determining choice of sustainability strategies adopted by group ranches in Samburu County, Kenya;
- iii). Identify societal characteristics determining choice of sustainability strategies adopted by group ranches in Samburu County, Kenya; and

iv). Find out management characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya.

1.5 Research Hypotheses

The study was conceived on the premise that sustainability of organizations such as group ranches depended on choices made for sustainability. Thus it was hypothesized that:

H₀:1.Environmental characteristics had no significant influence on choice of sustainability strategies adopted by group ranches in Samburu County, Kenya;

H₀:2.There was no significant influence of organizational characteristics on choice of sustainability strategies adopted by group ranches in Samburu County, Kenya;

H₀:3.Societal characteristics had no significant influence on choice of sustainability strategies adopted by group ranches in Samburu County, Kenya; and

H₀:4.Management characteristics had no significant influence on choice of sustainability strategies adopted by group ranches in Samburu County, Kenya.

1.6 Significance of the Study

Due to the rising global demand for livestock products and the increasing degradation of rangelands, where most of the group ranches were established, finding sustainable strategies to meet the global demand for livestock products and conservation of the rangelands was significant (UNEP, 2015). The study made some contribution towards understanding the determinants of choice of sustainability strategies applied by group ranches in Samburu County. The information could be used to identify appropriate interventions for the sustainability of group ranches in other regions.

The study added new knowledge to the existing literature on group ranches, especially the aspect of sustainability and choice of sustainability strategies adopted by group ranches. The study would be a source material to land practitioners and policy makers in determining the applicability of the group ranch system in Kenya; whether the system required a review or a complete paradigm shift. The study also offered empirical information for further research on the importance of land as an ownership and economic entity that contributed towards the attainment of Kenya's Vision 2030.

1.7 Scope of the study

The study focused on the group ranch form of communal land ownership under the group ranch model. It focused on group ranches in Samburu County, Kenya and targeted the registered members of group ranches. Private and co-operative ranches were left out of the study. The study was formulated to investigate the factors that influence choice of sustainability strategies applied by group ranches and focused mainly on the environmental, societal, management and organizational characteristics. The study was anchored on the Tragedy of the Commons Theory, Resource Based-view Theory and Sustainability Livelihood Framework (SL) Theory.

1.8 Limitations of the study

Although the study was basically qualitative, data collection instruments posed limitations. First it was a challenge to determine the type of questions to be contained in the Questionnaires, Focus Group Discussions and Key Informant Interviews. The questionnaires were filled in by members of group ranches, the FGDs included members of selected group ranches and Key Informant Interviews were conducted from people who were familiar with group ranches, for example the County Executive

Committee Members(CECMs) in charge of lands. It was possible to select a member who fitted in the three categories of research instruments. For instance, some County Executive Committee Members are members of group ranches and were mostly likely to be selected as respondents and at the same time be picked for FGDs and Key Informant Interviews (KIIs). Since most of the questions focused on people's perception of the phenomena under study, one was likely to get biased answers from people appearing in the three instruments. To mitigate this, the researcher ensured that no one appeared in all the three instruments. The members who filled in the questionnaires were disqualified from FGDs and KIIs to avoid providing biased answers.

Secondly, the respondents were expected to give their personal experiences about the phenomena under study. Some respondents were so inquisitive to know the motive of the study before filling in the questionnaires. This was in the initial stages in the administration of the questionnaires. To mitigate this, the researcher and his assistants explained the purpose of the study before administering the questionnaires.

Finally, the findings of this study might not be generalized to cover other types of ranches such as co-operative and private ranches that have different management practices and land tenure systems. To mitigate this, the study recommended for a study on the determinants of choice of sustainability strategies adopted by co-operative and private ranches in Samburu County.

1.9 Organization of the Thesis

The report is organized into five chapters. The first chapter of the thesis deals with the introduction, which incorporates problem statement, objectives, research hypotheses,

the significance of the study, and scope of the study and limitation of the study. The second chapter presents the literature review, conceptual framework and theoretical framework of the study. The research methodology is explained in the third chapter where sources of data, sampling methods, sample size determination and methods of data analysis are presented. Chapter four presents data analysis and interpretation while chapter five presents discussions of the findings, summary conclusions and recommendations of the study.

1.10 Definition of Key Terms

The following key terms are used in this study to imply and take the meanings as explained:

Group Ranch: The term is used to refer to a group of people jointly holding title to land and owning livestock individually but herding them together. Boundaries are demarcated and members are registered [Land (Group Representatives) Act, Cap 287 of the Laws of Kenya]

Group Ranch Dissolution: Refers to a situation where a group ranch is granted consent by the Registrar of Group Representatives to subdivide into individual landholdings. Each member gets an individual title instead of a collective title to land.

Group Representatives: Group representatives are a committee of not less than three and not more than ten persons elected by members of the group ranch at an annual general meeting under section 5(b) of the Land (Group Representatives) Act, Cap 287, Laws of Kenya with powers to sue and be sued in their corporate name and to acquire, hold and dispose of property of any kind and to borrow money with or without giving security on behalf of the collective benefit of the group.

Strategy: A strategy is a road map that shows the direction and measures undertaken by an organization to ensure it achieves its goals (Haberberg & Rieple, 2008). The term is used in this study to describe the means, the way, the methods, the path or approach taken by the group ranches to achieve their goals.

Sustainability: Sustainability means to endure, to last and to hold (Bennett, 2003). The term is used to refer to a situation where group ranches are established and are able to overcome environmental, social, economic and organizational challenges to last for a long period of time without dissolving and sub-dividing into individual landholdings.

Sustainability Strategies: Sustainability strategies are a combination of choices that group ranches make as well as the activities they undertake in order to obtain sustainable livelihoods (Kipainoi, 2013). The concept of sustainability strategies was used in the study to refer to the practices adopted by group ranches to make them hold together without disintegration (without dissolving and sub-dividing) for the present and future generations.

Community: The term is used in this study to refer to a clearly defined group of users of land identified on the basis of ethnicity, culture or similar community of interest as provided for under Article 63(1) of the Constitution of Kenya, 2010.

Environment: The term is used in the study to refer to the climatic conditions such as rainfall, temperatures and droughts that influenced the choice of sustainability strategies. They are the physical forces outside the control of group ranches that played a key role to influence the choice of sustainability strategies.

Competition: In economics, competition is the rivalry among firms trying to increase profits, market share and sales volume by varying the elements of market mix, price, product, distribution, and promotion (Acquaah, 2003). The term competition is used in the study to describe the contest between two or more group ranches for allocation of resources in the group ranch industry (Opoku & Fortune, 2011).

Resources: The term is used in the study to refer to anything that an organization or learns to do that enables it to conceive and implement strategies. It can be physical, financial, human, intellectual, and even reputational (Haberberg & Rieple, 2008). The term was conceived in the study as an intervening variable. The group ranches could be having very good strategies but implementing them would depend on the resources at their disposal.

Policy requirement: The term policy requirement is used broadly in the study to refer to policy requirements and legal framework from the government and non-state actors in the form of laws, policies, regulations, standards, guidelines, directives, communications, orders, or other types of documents. The term was conceived in the study as a moderating variable.

Ecotourism: Ecotourism is a form of tourism based on travel to natural and undisturbed areas such as conservancies, with a focus on environmental and cultural conservation and with benefits to the local community (Fennell, 2003).

Community-Based Ecotourism: Community based ecotourism is a variant of ecotourism based on community participation in decision-making, ownership and management of tourism projects and where a major proportion of benefits remain in the local community (Gaitho, 2014).

Choice of Sustainability Strategies: Choice is the outcome of a process which involves assessment and judgment (Beresford & Sloper, 2008). It involves the evaluation of different options and making a decision about which option to choose. The term is used in the study to refer to the action of choosing sustainability strategies that are applied by group ranches.

CHAPTER TWO

LITERATURE REVIEW

INTRODUCTION

This section reviewed the specific literature relating to various sub-themes that were relevant to this study. The chapter focuses on the theoretical review, empirical review and conceptual framework. The chapter presents reviews on previous work by scholars in the study of determinants of choice of sustainability strategies applied by group ranches and the related literature in the field of strategic management. It presents an overall picture of the literature covered by the objectives and hypotheses of the study.

2.1 Theoretical Review

This study was based in the field of strategic management, more specifically in strategy process research. In order to generate holistic insights into the choice of sustainability strategies adopted by group ranches in Samburu County, the study was guided by the Tragedy of the Commons Theory, Resource-Based View Theory and the Theory of Sustainable Livelihood.

2.1.1 The Tragedy of the Commons Theory

The Tragedy of the Commons Theory that states that any land that is communally held will be unavoidably grazed, guided the study. The theory describes a situation where there is a conflict over use of resources between individuals and the community. The tragedy occurs when individual interests override the community

interests (Lengoiboni, 2011). It simply refers to a situation where individuals ignore the well-being of the group in the pursuit of their personal gains (Borwein, 2013).

The Tragedy of the Commons Theory was applied to explain environmental and societal characteristics that influenced the choice of sustainability strategies adopted by group ranches in Samburu County. The theory was used because most of the group ranches were established in environments with unpredictable and unreliable climatic conditions with limited pastureland.

The literature review revealed that without regulations, some members of group ranches might keep as many livestock as possible hence stretching the available pastures. The Tragedy of the Commons Theory was based on a parable of herdsmen who shared common pastures but due to their individual selfish interests overstocked their herds and destroyed their commonly shared resources (Wayumba, 2013). In other words, if some members of a group ranch increased the number of their own livestock living in a group ranch, eventually the land would become depleted and unable to support the livestock which was detrimental to all (Veit, 2011). Therefore, the Tragedy of the Commons Theory was relevant in the study because group ranches were commonly owned by the members who had free access to the pastures therein with an unlimited number of livestock. There was a need to control the number of livestock each member kept to avoid a situation where the common good (pasture) was depleted.

2.1.2 Resource-Based View (RBV) Theory

Resource-Based View theory provides rationale for an organization's choice of strategies (Mbuuko, 2013). A resource can be defined as anything that an organization has or learned to do which enables it to conceive, craft and execute strategies (Haberberg & Rieple 2008). Organizations such as group ranches use a variety of resources such as human, intellectual, physical, financial, intellectual, and even reputational (Miller, 2006). In order to attain sustainability, organizations such as group ranches have to manage their resources in a sustainable manner (Akio, 2005).

Resource-Based View (RBV) theory views organization's resources as the main factors determining competitive advantage and performance. The theory emphasizes the fact that resources are heterogeneous and are limited in mobility (Barney, 2001). Where organizations such as group ranches in the same business (group ranching) have resources that are similar but perform differently, it can be deduced that they vary in the way they utilize their resources. So the Resource-Based View theory focuses on the differences between organizations as much as it focuses on the inherent properties of a resource. In order to sustain the position of the organization, the differences must be maintained and protected from competitors. Organizations such as group ranches always compete for resources and they use the same resources to compete (Bennett, 2003). In view of this, group ranches should use their resources wisely and in a sustainable manner because they operate in an open system with competitive conditions.

Resource-Based View theory also deals with the competitive environment facing organizations but it takes an inside-out approach, that is, its starting point is the organization's internal environment. The theory emphasizes on the internal capabilities of the organization in choosing strategies to achieve its competitive advantage in its market and industry. Organizations such as group ranches should be seen as made of resources and capabilities which can be configured to provide them with a competitive advantage. In other words, their internal capabilities influenced the choice of strategies they made in competing in their external environment (Akio, 2005).

Organizations such as group ranches are required to renew their resource-base to sustain themselves since the environment is likely to change over time. Resources are said to have a rent-producing potential if they contribute to building organization's competitive advantage. This rent-producing potential is sustained as long as the resource or bundle of resources on which the competitive advantage is based is immobile and not made obsolete by environmental changes (Haberberg & Rieple, 2008).

2.1.3 The Theory of Sustainable Livelihood

According to the Theory of Sustainable Livelihood, people have goals that they desire to achieve in their lives by undertaking certain activities and using certain resources accessible to them (Bennett, 2010). The theory is applicable in the study of choices of sustainability strategies of group ranches since the principal aim of group ranches is to improve and sustain the living standards of its members. Group ranches are owned by members engaged in activities meant to improve their livelihoods. A livelihood is said

to be sustainable when it copes with stresses and shocks, and maintains its capabilities and assets for the present and future generations.

Therefore, group ranches were required to craft and execute strategies that created sustainable livelihoods for their members. In other words, it was meaningless to have group ranches that could not improve the standards of living of the members. Since the main economic activity of group ranches was livestock production, there was need choose strategies that sustained ranching.

2.2 Empirical Review

The empirical review is an evaluation of what has been done about the subject under study, showing the relationships between different works, and how they relate to the study. The review introduced the concept of group ranches, reviewed literature on group ranching and the variables in the specific objectives of the study.

2.2.1 The Group Ranch Concept

The concept of group ranches describes a livestock production system in which land communally owned and membership is based on kinship and traditional land rights. The title deed to the land is collectively held by the members and the members are free to access land for usage (Republic of Kenya, 1968b). The Land Adjudication Act, Cap 284, facilitated creation of group ranches in Kenya by providing for the ascertainment of rights and interests in customary lands to the owners. Upon finalization of the land adjudication process, those recorded as a group were advised by apply to the Registrar of Group Representatives for incorporation (Republic of Kenya, 1968a).

The Land (Group Representatives) Act, Cap 287, provided for the administration and management of group ranches whereby the group ranch was owned commonly by all members in equal and undivided shares (Republic of Kenya, 1968b). Every member had a free access to the land, entitled to reside on the group land and to elect group ranch representatives of his choice who were expected to protect the property rights of the members. The elected group representatives were authorized to hold property on behalf of, and to act on behalf of and for the collective benefit of all group ranch members.

2.2.2 Evolution of Group Ranches in Kenya

The idea to form group ranches in Kenya can be traced back to the 1930s when the then colonial government realized that the carrying capacity of the rangelands was deteriorating due to overstocking. In order to curb the effects of overstocking, the government introduced strategies like culling, branding and grazing/quota programs. However, these strategies were resisted by the pastoralists because of the cultural belief that the more livestock one had, the more prestigious one was in the society (Kibugi, 2008).

On independence, Kenya embarked on the land adjudication strategy to register land with the hope that privatization of land would be a good strategy for conservation of rangelands-a practice which was considered inadequate under traditional communal ownership. Furthermore, issuance of freehold title deeds to land seemed justified since they acted as collateral security to those who wanted loans from the commercial banks and other lending institutions (Mwangi, 2007a).

The formation of group ranches in Kenya was officially anchored on the Lawrence Report of 1965 that recommended a communal land ownership, rather than an individual registration of land in the arid and semi-arid lands (Kibugi, 2008). The group ranches were established through the Kenya Livestock Development Policy (KLDP) that advocated for the transformation of former trust lands to registered land holdings with rights and responsibilities of land ownership being invested in group ranch members. This was an attempt by the post-colonial government to control environmental degradation and to increase livestock productivity (Mwangi, 2007a). Elsewhere, in the agricultural potential parts of Kenya, the government was pursuing land adjudication process for individualized land tenure system whereby the land owners were issued with absolute land ownership documents (Wachira, 2008).

As land tenure systems, group ranches were started in Kenya to recognize, protect and register land for the communities that lived in the rangelands where rain-fed agriculture was limited due to unfavorable climatic conditions (Odari, 2010). It was expected that registration of rangelands would provide security of tenure and create incentives for the group ranch members to invest in range improvement and ultimately to reduce the tendency to overstock (Mwangi, 2007b).

The group ranch concept was expected to reflect on the existing patterns of socio-economic behavior of the communities living in the rangelands. The government intended that each group would consist of individual families who normally lived and herded together so that group ranch development would be a genuine attempt to promote socio-economic change in ranching communities without unduly disrupting longstanding traditional socio-economic relationships (Veit, 2011).

The group ranch system seemed to offer the possibility of developing the rangelands without making the communities living in the areas landless as it had happened in some high potential regions of Kenya where similar programs to individualize communal lands resulted in landlessness and uncontrolled selling of land. Thus, the idea underlying the group ranches was to adapt freehold property rights to collective land management contexts in pastoralist areas in order to promote tenure security and ultimately invest in modern, commercial ranching practices in traditionally pastoralist areas (Republic of Kenya, 1968b).

The group ranches were first established mainly in the more productive rangelands in southern Kenya, predominantly Kajiado and Narok Counties., and later in other Counties such as Laikipia, Samburu, and Kwale as their tenure advantages in comparison to trust land became more apparent (Aggarwal & Thouless, 2009). Although the Land (Group Representatives) Act, Cap 287, clearly spelt out the way the group ranches would be managed, the existing group ranches faced numerous challenges such as failure by the group representatives to hold Annual General Meetings as prescribed in the Land (Group Representatives) Act, Cap 287 and embezzlement of group ranch funds. This was attributed to the fact that the leadership did not want to be held accountable by the members, or because the membership was too dispersed to allow a quorum, or the membership was too large to be able to operate as a single unit. Some groups did not maintain basic records such as meetings of AGMs and the register of members as required by the Act. As a result of these internal administrative shortcomings, most members supported dissolution and subdivision of their collectively held group ranches despite the reality that livestock production system would suffer (Mwangi, 2007b).

2.2.3 Administration and Management of Group Ranches in Kenya

The Land (Group Representatives) Act, Cap 287 spelt out the administration and management of group ranches in Kenya. The Registrar of Group Representatives was solely responsible for the general administration and management of group ranches in the Country. The registrar was responsible for the supervision of the administration of groups and kept a register for every incorporated group ranch containing names of all the registered members. The law required him/her to preside over all the Annual General Meetings held by the group ranches and made sure that the meetings met the required sixty per cent quorum (Republic of Kenya, 1968b).

The elected group representatives were responsible for the day-to-day administration management of group ranches and they exercised their powers on behalf and for the collective benefit of all the members of the group. Normally, the group ranch representatives were supposed to craft strategies meant to achieve the group ranch goals and consult the other members of the group on such exercise. The proposed strategies would be ratified by the members during an annual general meeting. Similarly, the land was held in undivided shares amongst the entire group ranch membership, as a form of collective freehold tenure (Republic of Kenya, 1968b).

2.2.4 Sustainability Strategies of Group Ranches

The concept of sustainability has its origin from the United Nations report of 1987, popularly known as the Brundt land report. In the report, sustainability was defined as the progressive way which satisfied the needs and aspirations of the present generation without compromising the possibility for the future generations to satisfy their needs and aspirations (Kuhlman & Farrington, 2010). Since then the concept has been re-interpreted differently by different professionals (Fratkin, 2001). To

anthropologists, cultural ecologists, and human rights advocates, sustainability means the ability of a people to preserve and defend their way of life. For pastoralists, sustainability means maintaining livestock production system, defending their land rights and having unlimited access to water and grazing resources while the environmentalists define it to mean the need to protect the earth's natural resources against further degradation for the present and future generations . Thus, the concept of sustainability is futuristic.

The concept of sustainability strategies was used in the study to refer to the practices adopted by group ranches to make them hold together without disintegration (without dissolving and sub-dividing) for the present and future generations. The literature review revealed that since its introduction in Kenya, the group ranch system was more than forty years old and yet there was a feeling among scholars that it had failed to meet its stated objectives and had also jeopardized the socio-economic and cultural welfare of the members (Mule, 2010). There was a growing trend toward dissolution and subdivision of group ranches into individual land holdings with subsequent sales of individual land units. As argued the dissolution and fragmentation of group ranch did not augur well for rangelands and their sustainability was at risk.

Fratkin and Mearns (2003) observed that the concept of sustainability was particularly important to the people practicing ranching in arid and semi-arid lands because the survival of livestock production system depended much on their physical and political ability to maintain access to land and land related resources. The importance of the concept of sustainability was also stressed by Ferrer (2008) who observed that organizations were like an on-going process and compared them to plants or human bodies; plants would grow and prosper if watered and cared for, but withered quickly

if they were not; if some parts of human bodies were ill, the rest would not function as they should. If too many parts failed at once or in quick succession, the bodies died.

The study established that group ranches were doing well in the formative years but disintegrated in the 1980s when most of them dissolved and issued individual land titles to the members (Mwangi, 2007a). The use of titles for collateral security motivated the members to demand for dissolution of group ranches. During the period, the population was also increasing, reducing the benefits of communal resources for the masses; and there was a sense of insecurity as non-members were allocated land by the group representatives. The outcome of subdivision favored wealthy cattle owners and the group representatives. The poor and those such as widows who could not afford to 'entertain' the committee got smaller parcels despite making formal and informal complaints.

The group ranch representatives of most group ranches rarely convened annual general meetings, never reached important decisions, and sometimes failed to implement their decisions. Further, they disposed of group land without consulting the other members of their groups (The National Land Policy, 2009). As a result, dips, water pumps and engines were not properly managed and maintained, livestock quotas were not enforced, and revenue was not collected for repayments of outstanding loans. The representatives of many ranches were young people, which exacerbated social conflicts in societies where authority is vested in elders. Older, more conservative and wealthy members were often opposed to group ranches and boycotted meetings. There was also conflict among ranch members regarding stock quotas. Quotas were to be allocated to each household in proportion to the number of

animals owned at the time of incorporation, but rich participants wanted larger stock quotas while the poor members felt that such quotas would inhibit their chances of increasing their wealth. In many ranches, a compromise was reached: members were allocated a minimum quota that was sufficient for viability and rich members were given any extra allocations.

In many cases, however, the members ignored their quotas and maximized their herd sizes. Most herd owners only sold the minimum number of animals to meet their financial commitments. As a result, commercialization did not take place, livestock numbers increased beyond the carrying capacity of the land and it became increasingly hard to sustain the group ranches.

Although the government was initially opposed to subdivision, the Land (Group Representatives) Act, Cap 287, enacted in 1968, provided for the dissolution and subdivision of group ranches. The group ranches that first implemented subdivision were close to urban centers and had areas of arable and irrigable land. In contrast, most ranches that were not subdivided had no arable land and were in the drier parts of the rangelands.

Research showed that subdivision of group ranches led to small land allotments, increased cultivation, and increased land sales. It also led to more cultivation on fragile marginal lands with higher intensity cropping on smaller holdings. The parcel sizes were typically too small to be ecologically and economically viable for traditional livestock production. For most households, the parcels were also too small to provide adequate family subsistence. Some individual holdings had been further sub-divided into even smaller parcels. However, some group ranches in Kajiado, Narok and Samburu Counties resisted the temptation to dissolve and adopted

sustainability strategies hence withstanding the environmental, organizational, management and societal challenges.

2.2.5 Determinants of Choice of Sustainability Strategies of Group Ranches

Numerous studies have been conducted to understand how people arrive at their choices and factors influencing them (Dietrich, 2010). Such studies include the ones on environmental factors (Nooraie, 2011; Deressa, Ringler, & Hassan, 2010), organizational factors, societal factors and management factors (Umukoro, 2009; Brill, Bishop, & Walker 2006; Pansiri, 2005) influencing the choice of strategies in organizations.

2.2.5.1 Environmental Characteristics and Choice of Sustainability Strategies

One of the most important management functions in an organization is the choice of a strategy that must be fully understood before execution (Nooraie, 2011). Although most of environmental influences on choice of strategies are generally understood to be task-related and competition-borne, the physical environment or climate plays a significant role in determining the strategies adopted by organizations such as group ranches (Deressa, et al., 2010). For instance, the growing global environmental change and increased climate variability are the physical environmental factors that influenced the choice of strategies adopted by organizations to reduce the risks associated with such variability (Ziervogel & Calder, 2003).

The variability of rainfall patterns has been identified as the single most important factor influencing land use practices, whether crop production, livestock or wildlife conservation (Ntiati, 2002). Ziervogel and Calder (2003) observed that the rain-fed agricultural strategies were influenced by the variability of rainfall that impacted

negatively on the livelihood security of the farmers. They further observed that the unreliability of rainfall patterns negatively impacted on the livestock production system and reduced pasturage in the rangelands. Their study observed that low rainfall influenced the performance of the individual animal while very heavy rainfall predisposed the animals to diseases and parasites, leading to deaths.

The International Livestock Research Institute (2010) reported that drought affected ranching in the rangelands of Kenya that cover 80% of the landmass with annual rainfall varying from 200 to 500 mm (Kandji, 2006). Due to droughts and other unfavourable environmental factors, the farmers developed both short-term and long-term strategies to cope with the effects of environmental challenges (Huho, Ngaira, & Ogindo, 2011).

The short-term drought coping strategies aimed at minimizing loss of livestock and their choices differed from one drought event to the other depending on the severity of the drought. These strategies included: grazing livestock early in the morning; establishment of feed reserves; formation of alliances with neighbours; migration and digging of shallow wells on the river beds. The long-term drought coping strategies aimed at cushioning the farmers against livestock losses during drought periods. They included: keeping livestock of mixed species; keeping of indigenous livestock breeds; keeping of female dominated herds; and increasing of herd sizes during inter-drought periods (Kipainoi, 2013).

Migration involved moving livestock from one grazing area to another in search of pasture and water. In Kajiado and Narok Counties, for instance, ranchers moved with their livestock for more than 40 Kilometres while others dispersed (spreading one's animals to several localities to counteract local risks of theft and diseases) their

livestock among friends and relatives in different ecological zones to avoid loss of entire stock (Huho, 2011). As a coping strategy, livestock mobility ensured that animals got fresh pastures and minerals, accessed water supplies, avoided overgrazing resources, human competitors and disease-carrying insects (Kipainoi, 2013). The literature revealed that rich households applied the herd mobility strategy more than the poor ones by moving a larger proportion of their herds while the poor households applied the strategy of keeping drought resistant animals more than rich ones by having a higher proportion of goats and sheep than cattle.

The literature reviewed also revealed that floods impacted negatively on communities with far-reaching social and economic consequences. The immediate impacts of flooding include loss of human life, damage to property, loss of livestock, and deterioration of health conditions owing to waterborne diseases. Floods cause damage and disrupt communication links and infrastructure such as power plants, roads and bridges leading to a standstill of economic activities. Furthermore, people are forced to leave their homes, disrupting their normal life (United Nations Development Programme, 2005).

The aforementioned studies dealt more on coping strategies than on sustainability and choice of sustainability strategies. Some environmental factors like floods and temperatures were mentioned to have influenced the livestock production system but there was little indication of how the factors influenced the choice of sustainability strategies. Hence, there was a need to determine the environmental characteristics influencing the choice of sustainability strategies adopted by organizations such as group ranches.

2.2.5.2 Organizational Characteristics and Choice of Sustainability Strategies

Previous studies revealed that organization characteristics such as organizational structure, past strategies and past experiences influenced the choice of strategies and performance of organizations (Moiko, 2012; Elbanna & Child, 2007). An organization has been defined as a structured, social entity that is goal-directed and is linked to the external environment (Daft, 2007). Every organization has a unique structure that reflects its current image, reporting relationship and internal politics (Mwita, 2013). The organization structure has been identified as an important organization characteristic that influenced the choice of strategies undertaken by the organizations for it facilitated the co-ordination and implementation of the organization's common goals (Moiko, 2012). An organizational structure is an arrangement by which various organisational activities and efforts are divided up and coordinated. It is pivotal between the tasks and the process for it affects crafting of new strategies or shifts in the existing strategies. An organization needs to be appropriately structured for the circumstances in which it finds itself and particularly the tasks it has decided to carry out (Elbanna & Child, 2007).

Therefore, any operating organization such as a group ranch should have its own structure such as a local governance system in order to operate efficiently with the aim of achieving the set targets (Moiko, 2011). The organizational structure positively influenced the choice and sustainability of an organization's strategies (White & Bruton, 2010). Therefore, understanding organizational characteristics influencing the choice of strategies adopted by organizations such as group ranches is important so that appropriate organizational designs for sustainability, can be drawn.

The past experiences and the past strategies have been identified as having influenced the choice of strategies made by organizations. In a study conducted by Juliusson, Karlsson, and Garling (2005), the past strategies were identified as having influenced the choice of strategies made by organizations in the future because when something positive resulted from a strategy, organizations were more likely to craft new strategies similar to the past strategies, given a similar situation. On the other hand Sagi and Friedland (2007) argued that organizations tended to avoid repeating past mistakes.

Although the aforementioned studies indicated that the organizational structure, the past experiences and the past strategies influenced the choice of strategies adopted by organizations, there was little empirical evidence linking the factors to the choice of sustainability strategies adopted by group ranches. Thus, it was found necessary to consider organizational characteristics in this study.

2.2.5.3 Societal Characteristics and Choice of Sustainability Strategies

Organizations are open systems since they operate within the broader community of society (Daft, 2007) and they craft and execute strategies linked to societal expectations. Previous studies identified culture, education and lifestyles as societal characteristics influencing the choice of strategies in organizations (Samuel & Chipunza, 2013; Mwakima, 2013; Odari, 2010; Maddison, 2006). Culture is defined to include what has worked in the experience of a society and is worth transmitting to future generations. It is that practice that is used and adopted by more people as it is the pervasive foundation that underlies all people's choices (Triandis & Suh, 2002).

Studies revealed that cultural practices influenced stock mobility, where men moved with their livestock in search for pasture leaving women and children behind. Livestock had a cultural value attached to it by a majority of ranching communities as a sign of wealth and prestige. Due to their high cultural value, it was not acceptable to slaughter livestock anyhow unless during certain special occasions such as circumcision and after birth. Therefore, the culture was identified as having an influence on the choices made by ranches. Thus, it was included as a variable in this study.

Another organizational characteristic identified to have influenced the choice of strategies and increased the probability of adoption of strategies is the level of education of the members of organizations such as group ranches. The level of education greatly influenced the understanding and the adoption of coping strategies applied by group ranches (Maddison, 2006). The study suggested that there was a need to increase the level of education of the group ranch members so that it would be easy for them to adopt the new strategies. The study considered the level of education among members of group ranches to be a variable in this study.

2.2.5.4 Management Characteristics and Choice of Sustainability Strategies

Numerous studies have been conducted on the relationship between management characteristics and the choice of strategies adopted by various organizations. The studies have revealed that management characteristics are the motivating factors influencing the choice of strategies adopted by organizations (Martin & Namusonge, 2014; Obiwuru, Okwu, Akpa & Nwankwere, 2012; Mathura, 2009; Wilson, Tyedmers & Pelot, 2006; Hafsi & Gauthier, 2003; Pegels, Song & Yang, 2002).

The studies revealed that the management team's experience plays an important role in helping to define the strategy of an organization and a change in the management team carries with it the likelihood that changes will be made in the organization's strategy (Pegels, Song & Yang (2002). This argument was supported by Jones and George (2009) who viewed management as the motivating factor behind the choice of strategies. He argued that since management plays an important role in helping to choose strategies, change in the management brings changes in the choice of strategies. Koech and Namusonge (2012) argued that when a change at the top management occurs, new persons introduce new strategies into the organization or improve on the existing ones.

Previous studies also revealed that the past experiences of the management influenced the choice of the future strategies adopted by organizations (Juliussen et al., 2005). It was reasoned that when something positive resulted from a decision, people were more likely to decide in a similar way, given a similar situation. On the other hand, organizations tended to avoid repeating past mistakes (Sagi & Friedland, 2007).

Another management characteristic identified as having an influence on the choice of strategies is tenure of office of the management (Umukoro, 2009). It was observed that the top management teams with long organizational tenure are expected to have great social cohesion, lessening the likelihood that individual members of a team will challenge the present situations. Long tenure provides a better understanding of organizational policies and procedures and a reluctance to change past ways of operating.

Finally, the level of education among the management has also been identified as having an influence on the choice of strategies made by organizations. Education was

viewed as an indicator of executives' knowledge, cognitive orientation and skill base (Balta, Woods & Dickson, 2010). Although these studies identified the level of education of the management, the tenure of office and the past experiences having influenced the choice of strategies applied by organizations, there is little empirical evidence to show that these factors influenced the choice of sustainability strategies adopted by the group ranches.

2.3 Conceptual Framework of the Study

The main objective of this study was to examine the determinants of the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. A conceptual framework was adopted to show the conceptual status of the objectives and the relationships between variables under study (Punch, 2006). Environmental characteristics, organizational characteristics, societal characteristics and management characteristics were visualized as independent variables while the choice of sustainability strategies was the dependent variable in the study. The study also considered the role played by the moderating variables as they affected the relationship between the variables. The moderating variables included policy requirements and politics while the intervening variables included resources and competition as illustrated in Figure 2.1.

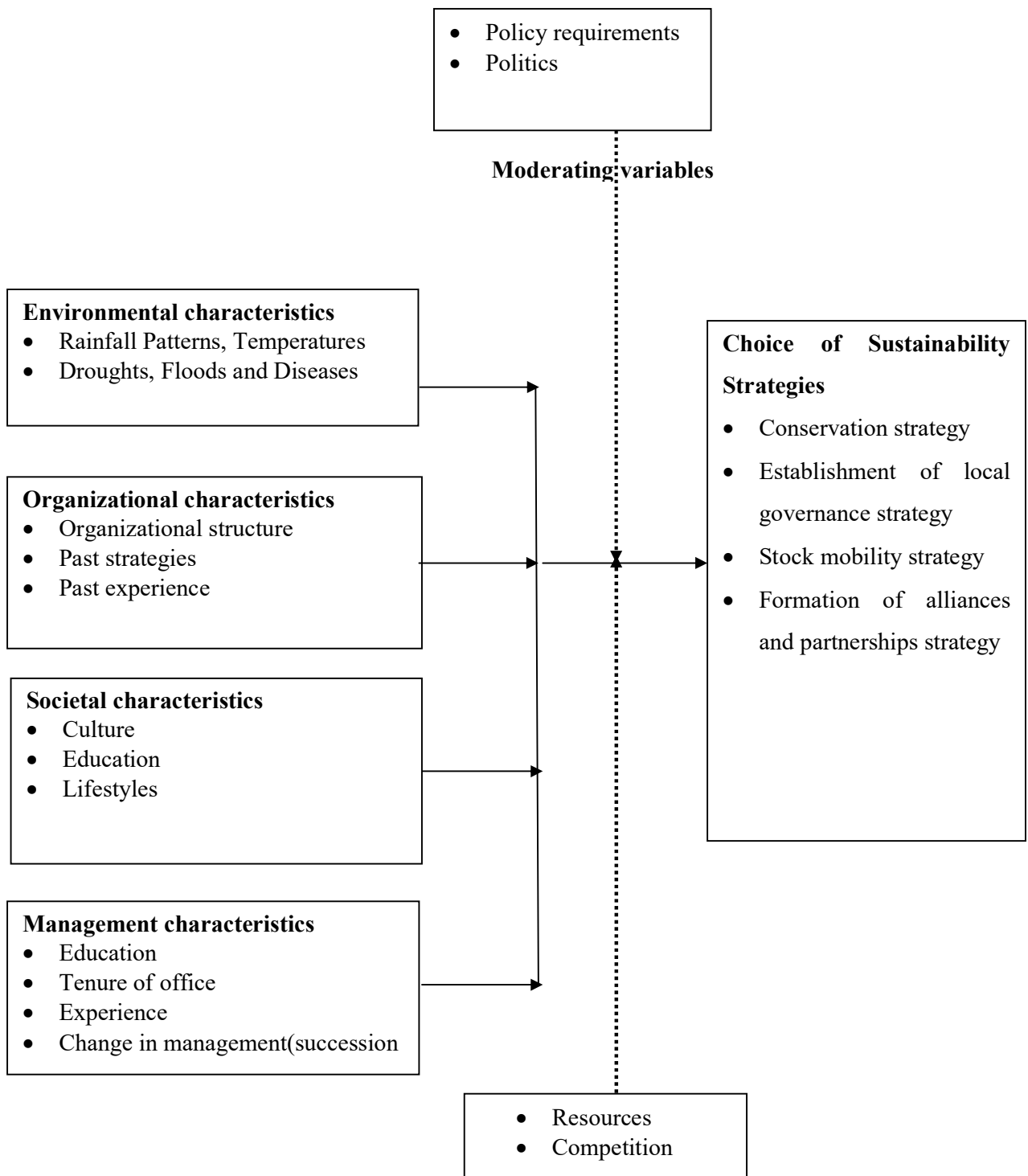


Figure 2.1: Conceptual Framework

Intervening Variables

Figure 2.1 is a diagrammatic representation of the relationship between the independent variables (environmental characteristics, organizational characteristics, societal characteristics and management characteristics) and the dependent variable (choice of sustainability strategies). The diagram also shows the moderating variables (policy requirements and politics) that directly or indirectly affected the degree of the relationship between the independent variables and the dependent variable.

A moderating variable is a factor that changes (increases or decreases) the otherwise established influence of the independent variable upon the dependent variable (Kothari, 2004). For instance, it was a policy requirement that all the group ranches in Kenya maintained registers containing the names of the members, the dates they became members, and qualifications for membership. Only members would be allowed to pass resolutions such as choosing sustainability strategies to be applied by group ranches. Another example of the role played by the moderating variables was where the ranchers were required to obtain permits from the Veterinary department to move livestock from one place to another (especially from one county to another).

The intervening variables are used to explain causal links between variables (Kothari, 2004). In figure 2.1 resources and competition among the group ranches had intervening effects on the choice sustainability strategies. The choice of livestock mobility from one place to another was informed by the availability of water and pasture in the place of destination. This is why scouts went ahead of the livestock to establish the availability and quality of pasture in the places the animals were moving to. In other words, lack of water and pasture caused the livestock mobility to areas where these resources were available.

2.5 Summary and Research Gaps

The concept of group ranches dates back to the 1930s when the colonial government realized that the carrying capacity of the Kenyan rangelands was deteriorating due to overstocking. The group ranch system was introduced later in the 1960s when the government of Kenya established the group ranches to: increase the production of the rangelands; pre-empt landlessness among the pastoral community due to the allocation of individual ranches to some pastoralists; improve earning capacity and reduce environmental degradation from overgrazing on communal land. However, a review of the literature revealed that by mid-1970s, most of the group ranches were not ecologically viable units as members often moved out of their group ranches in search of water and pasture, especially during the dry seasons and in times of stress, such as the drought of 1973-76. During this period, most group ranches dissolved and the future of the remaining group ranches seemed uncertain.

Since climatic conditions in the rangelands had not changed, and livestock production strategy remained the most suitable land use, sustainability of group ranches and the choice of sustainability strategies adopted by the group ranches was an important area worth studying. A review of strategic management literature revealed that organizations operate in a complex, dynamic and turbulent environment that is continually changing. Review of previous studies shows environmental characteristics, organizational characteristics, societal characteristics and management characteristics influenced choice of strategies made by organizations that affected their general performance. The general performance of the organizations determined whether they would remain in business or not.

Despite the fact that there was an indication that the group ranches adopted coping strategies to reduce the vulnerability of the members to the adverse climatic conditions, most of them went ahead to dissolve while others were being urged by the members to dissolve. The reasons for subdivisions were many and varied from one group ranch to another; depending on the decisions made by the members who were the owners of the group ranches.

The Constitution of Kenya (2010) provided for the management of land resources in the rangelands such as Samburu County, where land adjudication was on-going at the time of the study, in a sustainable and productive manner. The constitution also allowed for the establishment of group ranches in the Kenyan dry lands and classified them as community land. Thus, there was a need to develop strategies for sustainable use of the rangelands that would hold group ranches together for the present and future generations.

Although previous studies revealed that a majority of group ranches adopted coping strategies, there was little information on how these coping strategies were arrived at and yet choosing a strategy is an important component of the strategic management process. The other missing point was: were all the copying strategies sustainable? If yes, why did most of the group ranches established in the late 1960s and early 1980s, dissolve? What sustainability strategies should the group ranches adopt? What influenced the choice of sustainability strategies applied by the group ranches? Therefore, information on the factors influencing the choice of sustainability strategies adopted by group ranches was important because this would help to identify factors to be considered when formulating policies affecting the establishing,

administration and management of the group ranches. The previous studies failed to address this gap.

CHAPTER THREE

RESEARCH METHODOLOGY

INTRODUCTION

This chapter presents the research methodology that was used for the purpose of examining the determinants of the choice of sustainability strategies adopted by the group ranches in Samburu County, Kenya. Specifically, the chapter comprises of research philosophy, research design, target population, sampling design and procedure, data collection instruments, validity and reliability of the research instruments, data collection procedure, data analysis, and ethical considerations.

3.1 Research Philosophy

Since the purpose of the study was to examine the determinants of choice of sustainability strategies adopted by group ranches in Samburu County, the most appropriate method was to interview members of group ranches in the County. Through the interviews, the researcher was able to gather empirical information to interpret and describe the determinants of choice of sustainability strategies adopted by group ranches in the study area, based on the conceptual framework of the study. From the interviews, the researcher derived an interpretation of reality and established that reality is a social construction and is interpreted differently by each individual member of the group ranch.

Therefore, the study was anchored on the philosophy of constructivism that describes how people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences. It means that when people

encounter something new, they have to reconcile it with their previous ideas and experiences, maybe changing what they believe, or maybe discarding the new information as irrelevant (Liu & Mathews, 2005). For example, when group ranches are established, members compare their welfare before and after the formation of group ranches. Out of the experiences, the members will learn from strategies that never worked and come up with others that are not only sustainable themselves, but can make the group ranches sustainable. Overall, the philosophy of constructivism was used to explain how members of group ranches constructed their own understanding and knowledge of the sustainability of group ranches through past experiences and past strategies.

3.2 Research Design

A research design is a plan, an outline, a structure, a blueprint or a program of investigation used to obtain answers to research questions. It is an important tool in research for it makes it as efficient as possible, yielding maximal information with minimal expenditure of effort, time and money (Kothari, 2004). Research design involves describing people's perceptions to questions about a situation and the sampled respondents' views are taken to represent those of the entire population (Mugenda & Mugenda, 2003).

This study adopted a descriptive survey research design that involves describing the respondents' responses about a phenomenon in order to understand their perception of the phenomenon from which truism is constructed. The descriptive survey design was used to collect data in order to test hypotheses concerning the current status of the subject in the study ((Ng'ang'a, Kosgei & Gathuthi, 2009).

The descriptive survey research design has been used before in numerous studies. For instance, the study to investigate strategies adopted by Non-Government Organizations (NGOs) to increase financial sustainability in Kenya applied the design (Waiganjo, Ng'ethe & Duncan, 2012). Another study that used this design was the one that examined coping strategies adopted by farmers in Laikipia County, Kenya (Huho, 2011). This study collected views from a sample of registered members of group ranches in Samburu County on the choice of sustainability strategies and the views were taken to be the views of the entire population. Elected members of the group ranches were in the management and were also interviewed to provide views on the management.

3.3 The Study Area

This section presents the physical and human attributes of Samburu County. Specifically, the section presents the location and the size of the study area, the climate, the topography and the types of soil, the demographic features and the land use patterns.

Samburu County was chosen as the study area for two good reasons. First, the area was one of the rangeland counties in Kenya where ranching was the dominant land use. The area was considered suitable for the study because ranching is characterized by seasonal migrations of herders and their livestock in search of pasture and water.

The second reason for choosing the area was due to the fact that the county had established group ranches that adopted various strategies to reduce adverse effects of unreliable rainfall patterns, droughts, extreme temperatures and disease (Fratkin, 2001). However, there was little empirical information on the determinants of choice

of the strategies adopted by group ranches in the study area. Moreover, land adjudication process was on-going and group ranches were being established.

3.3.1 Location and Size

Samburu County is one of the delimited forty-seven Counties in Kenya. It is located within the arid and semi-arid parts of Kenya in the northern part of the Great Rift Valley, about 300km north of Nairobi. The County borders Turkana County to the North West, Baringo County to the South West; Marsabit County to the North East, Isiolo County to the East and Laikipia County to the South. Samburu County covers an area of approximately 21,126 km² of Kenya's geographical area (approximately 541,416 square kilometers). Appendix IV shows the location and size of Samburu County.

3.3.2 Climate

Samburu County is located in the arid and semi-arid lands (ASALs) of Kenya. The climate is hot, dry with cool nights with an average annual maximum temperature of 30°C (86F) and minimum annual temperature of 20°C (68F). The County receives between 150–750 mm of rainfall annually that is concentrated in two rainy seasons in April and October, with highland areas receiving additional rainfall in July and August. The long rains are usually received between March and May. Rainfall is spatially and temporally erratic, and the County experiences droughts about every five years (Lesogorol, 2008). The vegetation is composed of more than two dozen plants communities, but thorny scrubs cover much of the County and the most common are *Acacia elator*, *Acacia tortolise*, *Salvadora pesica* and the Down palms.

3.3.3 Topography and Types of Soil

The topography, soil types and vegetation cover influence distribution of population and settlement patterns in Samburu County. Kirisia division is one of the divisions in the county predominantly covered by sandy loam and sandy clay soils, mostly lithosol and cambisols. In the areas covered by lithosols, water run-off is common causing serious erosion because of the nature of the soils. Lorroki Division is also predominantly covered by sandy loam soils. The soils are mostly well-drained phaeozems although some parts are covered by shallow lithosols, including areas around Suguta Marmar where the risk of flooding is classified as medium. The lithic phase of the soils encourage run-off during periods of high precipitation. Samburu North, comprising of Baragoi and Nyiro divisions, mainly consists of boulder cambisols and lithosols soils. The soils are particularly more stony and rocky in the southern slopes of Mt Nyiro and Ndoto Mountain. These soils are shallow and have a lithic phase, a characteristic that makes them prone to erosion.

3.3.4 Land Use

Samburu County consists of three livelihood zones: pastoral-all species with 56.5 per cent; agro-pastoral with 36.9 per cent; and a formal employment/business/petty trade at 6.4 per cent of the county population. Samburu County has total 139,892 hectares of arable land mainly concentrated in Samburu central highlands. Here, the main food crops grown are maize, beans and wheat. Barley is also grown in small quantities. The area under crops is approximately 4,000 hectares and 3,200 hectares for food and cash crops respectively. The main cash crops grown are barley, and wheat especially in high altitude areas of Porrer (Lesorogol, 2008).

According to Kenya Integrated Household and Budget Survey (KIHBS, 2005/06), 29.2 per cent of households were engaged in crop farming on parcel sizes averaging 0.8 acres with just 3.3 per cent of land parcels being operated by owners who also hold title deeds. Livestock production is the main livelihood activity as about 88.9 per cent of the households own livestock in Samburu County. The main livestock species include cattle, goats, sheep and camels and livestock production contributes 85 per cent to the Gross Domestic Product.

The land ownership in the county falls into three categories namely; community land, public land and private land. Only 5 per cent of the population possesses title deeds and most of the land is under communal ownership. This limits access to loans and other investment opportunities guaranteed by land title. The primary land use practices are ranching and wildlife conservation which account for over 90 per cent of the total land holding in the county. The county has the largest number of wildlife outside game reserves. Well known wildlife conservancies such as Lewa and Kalama community are located in the County. Mixed crop-livestock farming is undertaken in favourable areas like Porrer in Kirisia division, Baragoi and south Horr and Tuum in Nyiro divisions. Farm sizes range from small scale (with less than 0.4 hectares mostly in Porrer) to large-scale with average of 20 hectares where wheat is also grown. Gazetted forests occupy 15 per cent of land area providing habitat and forage for both wildlife and livestock.

3.4 Target Population

The target population can be described as the total group of individuals/elements/units from which a sample might be drawn (Kothari, 2004). The study targeted 16,611 registered group ranch members from the existing group ranches in Samburu County. The members approved recommendations by group ranch representatives (officials) regarding choice of sustainability strategies. These recommendations were tabled before the members, at the Annual General Meetings, for concurrence and approval. The group ranch representatives (management) executed the strategies as per the resolutions (Republic of Kenya, 68 b).

3.5 Sampling Strategies

Sampling can be described as the statistical process of selecting and studying the characteristics of a relatively small number of items from a relatively large population of such items. It also means selecting a given number of subjects from the target population to represent it (Kothari, 2004).

In the study, a sample frame of 16,611 items indicating the membership of all the group ranches in Samburu County was constructed. There were approximately 16,611 registered members of group ranches in Samburu County (Registrar of Group Representatives, 2015). The researcher compared all the registers kept by the Registrar of Group Representatives in Nairobi with those kept by the Assistant Registrar, Samburu and chairmen of the respective group ranches in the county.

The sampling of the population in the study was necessary because a target population of 16,611 registered members was too large for a complete enumeration. Furthermore,

sampling would save time and money, allow more time to be spent on training research assistants, testing and checking the instruments (Ader et al., 2008).

The researcher sampled 30 per cent of the 38 group ranches operating in Samburu County to give a sample size of 12 group ranches as recommended by Mugenda and Mugenda (2003), a sample of between 10 per cent and 30 per cent of the accessible population for a descriptive research design is acceptable. The sampled 12 group ranches had approximately 5,643 registered members from which the study sample was drawn and the following formula was adopted to determine the sample size:

$$n = \frac{N}{1 + N(e)^2}$$

Where n = desired sample size, N= Target population, E= error term and 1 is a constant.

$$\text{Therefore } n = \frac{5643}{1 + 5643(0.05)^2} = \frac{5643}{1 + 5643 \times 0.0025} = \frac{5643}{1 + 14.1075}$$

$$n = \frac{5643}{15.1075} = 373.523 = \mathbf{374} \text{ (group ranch members)}$$

The main sampling procedures used in the study were systematic and purposive sampling. Systematic sampling involves selecting every nth item on the sample frame (Kothari, 2004). The sampling strategy was used to select 12 group ranches and 374 respondents from the selected 12 out of 38 group ranches in the study area.

The purposive sampling strategy was used to select respondents considered to have things like common sense, experience, intuition and expertise in the subject being studied (Ng'ang'a et al., 2009). The strategy is also used in the selection of a group of

subjects from a larger group for study based on the judgment of the researcher as to which subjects best fit the criteria of the study (Huho, 2011; Kimani & Rukwaro, 2007). The strategy was used to select Key Informants who included Director of Land Adjudication and Settlement, the Registrar of group representatives, officers from the Samburu County Government and other experts in the land sector. The Key Informants gave information on the environmental, organizational, management and societal characteristics that influenced the choice of sustainability strategies adopted by group ranches. Purposive sampling was also used to select participants in the Focus Group Discussions who gave views on the environmental, organizational, management and societal characteristics influencing the choice of sustainability strategies adopted by group ranches in Samburu County.

3.5.1 Sample Size Determination

A sample is a set of individuals selected from the target population and its ultimate purpose is to represent the population in the study (Neuman, 2000). Although it was desirable to include all the respondents in the study, the researcher sampled 30 per cent of the 38 group ranches that had been established in the study area to give a sample size of 12 group ranches (Mugenda & Mugenda, 2003). The 12 group ranches had a membership of approximately 5,643 from which the study sample was drawn. Systematic sampling was used to select 12 group ranches from the sample frame of 38 group ranches. Given that there were 38 group ranches in Samburu County and 12 group ranches had been selected, the elevation factor was $38/12=3$. To get the specific names of group ranches from which the respondents were drawn, the group ranches were numbered from 1-38. And then a number n was chosen randomly from 1 to 3 and this was the first group ranch selected. Then, the researcher selected number $n+3$,

n+3•3 and so on. That is, the researcher counted two group ranches on the list and picked the third group ranch in order to come with a smaller sample frame of 12 group ranches. The selected group ranches were; Losesia, Girgir, Ngutuk, Sapashe, Elbarta, Ngilai, Lesephen, Marti, Suguta-marmar, Mbaringoni, Malaso and Porokwai. Each group ranch had its own members and the sample size was calculated proportionally as indicated in Table 3.1.

Table 3.1: Sample Size

S/NO	Group ranch	Total Membership	Sample Size(Proportionate)
1	Losesia	402	27
2	Girgir	922	61
3	Ngutuk	954	63
4	Sapashe	618	41
5	Elbarta	397	26
6	Ngilai	414	27
7	Lesephen	293	19
8	Marti	500	33
9	Suguta/Marmar	171	11
10	Mbaringoni	556	37
11	Malaso	180	12
12	Porokwai	236	16
TOTAL		5643	374

Table 3.1 indicates the names of the sampled group ranches and the numbers of respondents selected from each group ranch.

3.5.2 Sampling Unit and Units of analysis

The sampling unit for the study was the group ranch while the units of analysis were the registered members in the sampled group ranches.

3.6 Data Collection Sources and Methods

This involved developing research instruments that assisted in collecting the necessary information for the study. The instruments were required to be both valid and reliable. A valid instrument must measure what it is supposed to measure and must be relevant with respect to the objectives of the study while a reliable research instrument is the one that is stable, consistent, accurate, dependable and predictable (Ng'ang'a, et al., 2009). The study used Questionnaires, Interview Schedules and Focus Group Discussions to collect data. The data was obtained from both primary and secondary sources.

3.6.1 Sources of Primary Data

Primary data were collected through the administration of questionnaires to the sampled members of group ranches, Focus Group Discussions (FGDs), Key Informant Interviews (KIIs) and Direct Field Observation in the months of February and March, 2016.

A. Questionnaires

The questionnaires were the main tools used to collect the necessary information from the sampled respondents. They contained both closed and open-ended questions and were administered by the researcher and the research assistants. Where the respondents requested to be given more time to fill, the questionnaires would be

dropped and picked later. The questionnaire was developed in English but the researcher requested the research assistants to translate it into Kiswahili or Samburu languages whenever they came across a respondent who never understood the English language. Data collected included demographic characteristics of the respondents and the environment, organizational, management and societal characteristics influencing the choice of sustainability strategies.

Prior to the survey, the researcher and the research assistants undertook a pilot study at Losesia group ranch and interviewed twenty members of the group. The aim of the study was to find out whether the respondents understood the questions. The questionnaire was revised to make it clearer.

B. Focus Group Discussions

The Focus Group Discussion (FGDs) is one of the strategies used to collect information to come up with a strategy to solve a problem. The strategy requires the moderator to have immense observation skills to make the discussion meaningful and to generate detailed information on group dynamics on the key issues of the research topic such as choice of sustainability strategies adopted by group ranches in Samburu County (Mwanje, 2001). This method of interviewing participants in FGDs is largely from marketing research but has since been adopted to include social and applied research (Marshall & Rossman, 2006).

In this study, FGDs were held to generate qualitative data to supplement data collected quantitatively. The discussions were held on the appropriate time the participants agreed and were based on the prepared checklists. The groups included both male and female members of the selected group ranches. One FGD was held in

each of the sampled group ranches making a total of 12 FGDs. The number of each FGD participants ranged from six to eight (Krueger, 2002) and the researcher provided the necessary rules and set the tone of the discussion. Questions aimed at getting information on the determinants of choice of sustainability strategies adopted by the targeted group ranches were asked (Appendix III). The FGDs were also conducted to gain insight into how people constructed environmental, organizational, management and societal issues by sharing their knowledge and experiences.

C. Key Informant Interviews (KIIs)

This strategy involves interviewing a small group of individuals, ranging from 15 to 35, who are likely to provide needed information, ideas, and insights on a particular subject such as group ranching and the interviews are qualitative in nature. Key informants are usually sought for not because they statistically represent the organization being studied but because of their familiarity with the organization and their willingness to provide the required information (Gupta, Shaw & Delery, 2000).

In this study, additional primary data was also collected from Key Informants like the Director of Land Adjudication and Settlement, Registrar of Group Representatives, County Chief Executive Committee Member in charge of lands, National Land Commission officials, County Assistant Registrars of Group Representatives and Land Experts. The Key Informants were purposively selected whereby respondents with knowledge and competence in the information being sought for were identified and sampled (Huho, 2011). Through probing, the researcher was able to gain in-depth information on the situation of group ranches and how environmental, organizational, management and societal characteristics influenced the choice of sustainability strategies adopted by group ranches.

D. Direct Field Observation (DFO)

The observation method of primary data collection involves gathering information from the study area by directly observing the phenomena without asking from the respondents and the data obtained through this strategy relate to what is currently happening (Kothari, 2004). This observation technique gives the researcher the opportunity to observe directly socio-economic and demographic realities as well as livelihood conditions of the members in the study area (Worku, 2011).

In the study, the researcher used observation as a supplementary technique to collect data and crosscheck the collected data by use of an observation record sheet. The method was used to collect information on Wildlife Conservancy Camps, Tourist Lodges, Schools, Dispensaries and other social amenities put up by group ranches like Girgir and Ngutuk.

3.6.2 Sources of Secondary Data

Secondary data refer to data which have already been collected and analysed by someone else (Kothari, 2004). Documented data on environmental, organizational, societal and management characteristics influencing the choice of sustainability strategies of group ranches was obtained from texts, newsletters, papers from professionals, journals and reports from the office of the Registrar of group representatives and the National Land Commission. This strategy involved reviewing the literature on strategic management, ranching, choice of sustainability strategies. The researcher made use of Karatina University, Kenya Methodist University, University of Nairobi and NACOSTI libraries. Other data were obtained from Samburu County documentation centre to supplement the primary data.

3.6.3 Validity of Research Instruments

The validity of research instruments lies at the heart of a competent and effective study. It refers to the extent to which it measures what it is designed to measure (Ng'ang'a, et al., 2009). For this study, the validity of the research instrument was determined using the content validity method. The content validity is the extent to which a measuring instrument provides adequate coverage of the topic under study (Roberts & Henson, 2001). If the instrument contains a representative sample of the universe, the content validity is good. Its determination is primarily judgemental and intuitive.

The content validity can also be determined by a panel of persons to judge how well the measuring instrument meets the standards, but there is no numerical way to express it (Kothari, 2004). This method of validation determines if the instrument adequately addresses the objectives of the study and also checks the format of the instrument. The experts examine the items contained in the instruments and decide what the specific items are intended to measure (Mugenda & Mugenda, 2003).

To further check on the content and format of the questionnaire, the researcher approached four students pursuing post graduate studies and four land management practitioners and issued them with research questionnaires and interview schedules. They were required to give their opinion on whether or not the research instruments were appropriate to be used in the study. Their recommendations, together with the views from the pilot study respondents, were used to improve the research instruments.

3.6.4 Reliability of the Research Instruments

The reliability of research instruments, just like validity, lies at the heart of any competent and effective research (Roberts & Henson, 2001). It refers to the degree to which a research instrument yields consistent results of data after repeated trials (Cooper & Schindler, 2001). It is the extent to which measurements of the particular test are repeatable and the procedure yields consistent results on repeated tests (Malhotra, 2004). The more consistent the results given by repeated measurements are, the higher the reliability of measurement procedures (Zikmund, 2003).

The first draft of the questionnaire was given to four experts in the field of strategic management who were asked to review the instrument and to make recommendations for improving its reliability. These recommendations were then incorporated into a second draft of the instrument which was later used in the pilot study during the month of January, 2016 that involved 20 respondents randomly selected.

To assess internal consistency reliability estimates of the questionnaire, the researcher used Cronbach's alpha method. Cronbach's alpha is a reliability coefficient that measures inter-item reliability or the degree of internal consistency between variables measuring one construct (Malhotra, 2004). In social sciences, acceptable reliability estimates range from 0.70 to 0.80 (Kothari, 2004) and any alpha coefficient higher than 0.7 indicated that the gathered data had a relatively high internal consistency and could be generalized to reflect opinions of all respondents in the target population (Mandrish & Schaffer, 2005).

The index alpha was computed using SPSS (version 21.0) and measured the average of measurable items and its correlation. Cronbach's alpha was established for every variable which formed a scale as shown in Table 3.2.

Table 3: 2: Reliability Analysis

Variable	Cronbach's Alpha	Number of Items
Environmental Characteristics	0.839	13
Organizational Characteristics	0.853	3
Societal Characteristics	0.863	3
Management Characteristics	0.859	4
Average	0.854	

Table 3.2 shows the reliability of environmental, organizational, management and societal characteristics/variables using the Cronbach's Alpha method. Societal characteristics had the highest reliability ($\alpha= 0.863$), followed by management characteristics ($\alpha=0.859$), organizational characteristics ($\alpha=0.853$) and environmental characteristics ($\alpha=0.839$). This illustrates that all the four variables were reliable as their reliability values exceeded the prescribed threshold of 0.7 as contended by Field (2009).

3.6.5 Factor Analysis Results on the Reliability of the Questionnaire

3.6.5.1 Environmental Characteristics

Table 3.3 Factor Analysis Characteristics of Environmental

Component Matrix	Component
	1
Rainfall	0.818
Temperatures	0.819
Droughts	0.871
Floods	0.801
Diseases	0.803
Community based eco-tourism	0.896
Wildlife conservation	0.830
Stock mobility	0.856
Diversification of herd species	0.789
Purchase of fodder	0.883
Mining	0.884
Moving livestock to pasturage	0.860
Lease of land	0.819

Table 3.3 shows factor analysis results for thirteen statements/items regarding the influence of environmental characteristics on the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. The results indicated a coefficient of more than 0.7 hence the statement was reliable and therefore were retained for actual data collection and final study.

Table 3.4: Reliability Statistics of Environmental Characteristics

Cronbach's Alpha	Number of items
0.839	13

Table 3.4 shows Cronbach alpha values for environmental characteristics. From these findings it can be concluded that the construct measured had adequate reliability for the subsequent stages of analysis since the Cronbach Alpha value (0.839) was greater than 0.7 (Sekaran, 2003).

3.6.5.2 Organizational Characteristics

Table 3.5: Factor Analysis of Organizational Characteristics

Component Matrix ^a	Component
	1
Organizational Structure	0.816
Past Strategies	0.897
Past Experiences	0.860

Table 3.5 shows factor analysis results for four aspects regarding assessing organizational characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. The results attracted a coefficient of more than 0.7 hence the statements were valid and therefore retained for actual data collection and final study.

Table 3.6: Reliability Statistics of Organizational Characteristics

Cronbach's Alpha	Number of Items
0.853	3

Table 3.6 shows Cronbach alpha values for organizational characteristics. From these findings it can be concluded that the construct measured had adequate reliability for the subsequent stages of analysis since the Cronbach Alpha value (0.853) was greater than 0.7 (Sekaran, 2003).

3.6.5.3 Societal Characteristics

Table 3.7: Factor Analysis of Societal Characteristics

Component Matrix	Component
	1
Culture	0.915
Level of education	0.821
Lifestyles	0.818

Table 3.7 shows factor analysis results for three aspect regarding societal characteristics determining choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. The results attracted a coefficient of more than 0.7 hence the statement were valid and therefore retained for actual data collection and final study.

Table 3.8: Reliability Statistics of Societal Characteristics

Cronbach's Alpha	Number of Items
0.863	3

Table 3.8 shows Cronbach alpha values for societal characteristics. The construct measured had adequate reliability for the subsequent stages of analysis as the Cronbach Alpha value (0.863) was greater than 0.7 (Sekaran, 2003).

3.6.5.4 Management Characteristics

Table 3.9: Factor Analysis of Management Characteristics

Component Matrix ^a	Component
	1
Level of Education	0.890
Tenure of Office	0.979
Experience of Management	0.908
Change in Management (Succession)	0.810

Table 3.9 shows the factor analysis results for management characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya and the statements attracted a coefficient of more than 0.7 hence the statement were valid and therefore retained for actual data collection and final study.

Table 3.10: Reliability Statistics of Management Characteristics

Cronbach's Alpha ^a	Number of Items
0.859	4

Table 3.10 shows Cronbach alpha values for management characteristics. From these findings it can be concluded that the construct measured had the adequate reliability for the subsequent stages of analysis since all the Cronbach Alpha values (0.859) were greater than 0.7 (Sekaran, 2003).

3.7 Methods of Data Analysis

Multi-linear regression model was used to determine the relationship between the independent variables (environmental, organizational, societal and management characteristics) and the dependent variable (choice of sustainability strategies). The data analysis was done with the help of the Statistical Package for Social Sciences (SPSS version 21.0) complemented by Microsoft Excel. First, data collected was cleaned, sorted and collated. Then, it was entered into the SPSS software, after which the analysis was done. Descriptive statistics such as mean scores, frequencies and percentages for each variable was calculated and tabulated using frequency distribution and tables to describe the characteristics of the data. Likert-scale (ranging from 1-5) was used to measure the respondents' attitude to the individual questions and items.

Inferential statistics were conducted using multi-linear regression technique. The study used the Pearson correlation coefficient to test the significance of the linear relationship between the variables. Correlation coefficient values ranged between -1 and 1 which measured the degree to which two variables were linearly related with

the higher magnitude indicating a higher degree of association. This analysis was conducted at 95 per cent confidence level.

3.7.1 Analytical Model

Multi-linear regression model was used to analyze the effect of each independent variable on the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. The following regression equation was adopted: $Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$, where Y=Choice of Sustainability Strategy; α_0 = Constant to be estimated by the model; β_1 = Coefficient indicating influence of independent variables on the dependent variable; X_1 =Environmental Characteristics; X_2 = Organizational Characteristics; X_3 = Societal Characteristics; X_4 =Management characteristics and e = Error term

3.7.2 Measurement Scale

The likert scale of 1-5 was used to assess the intensity of the respondents' perception about the environmental characteristics, organizational characteristics, societal characteristics and management characteristics on the choice of sustainability strategies adopted by group ranches in Samburu County. The scale was assigned the following values: 1-Not at All (NA); 2-Low Extent (LE); 3-Moderate Extent (ME); 4-Great Extent (GE) and 5-Very Great Extent (VGE).

3.8 Ethical Considerations

Before commencement of field data collection, a research clearance letter and permit were obtained from the Dean, School of Business, Karatina University and the NACOSTI, respectively. Three research assistants, able to speak and write in Samburu, Kiswahili and English languages, were recruited. They were involved in the

pilot study and trained in research procedures, ethical issues and to uphold confidentiality at all times while carrying out the study. The respondents were informed that their responses would be kept confidential and used only for academic purposes. Courtesy calls were made to the Samburu Governor, County Commissioner, Director of Education, Deputy County Commissioners, Assistant Deputy Commissioners and the offices of group representatives. In all these offices, copies of both the research clearance letter and permit were left for record purposes.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

INTRODUCTION

This chapter contains the results of data analysis, presentations and interpretation of findings of the study. It includes the analysis of the determination of environmental characteristics, organizational characteristics, management characteristics and societal characteristics on choice of sustainability strategies adopted by group ranches in Samburu County.

4.1 Demographic characteristics

4.1.1 Response Rate

A total of 374 questionnaires were distributed to the targeted 374 respondents. Out of which 350 questionnaires were returned, accounting for 93.6 per cent, while those not returned were 12 and accounted for 6.4 per cent as indicated in Table 4.1.

Table 4.1: The Response Rate of Respondents

	No. of Respondents	Percentage
Returned	350	93.6
Not returned	24	6.4
Total	374	100.00

The respondents who participated in the study were 350 registered members (including the group ranch officials) out of the targeted 374 from 12 group ranches. The response rate was 93.6 per cent that could partly be attributed to the personal administration of the questionnaires. This was sufficient to enable the researcher generalize the results for both the target population and the study.

4.1.2 Distribution of the Respondents by Gender

The study sought information on the distribution of the respondents by gender. The findings are presented in Table 4.2 showing gender distribution of the registered group ranch members. The results indicated that 85.4 per cent of the respondents were males and 14.6 per cent were females.

Table 4.2: Gender Distribution of the Respondents

Gender	Frequency	Percentage
Male	299	85.4
Female	51	14.6
Total	350	100.0

The results in Table 4.2 reveal that majority of the respondents were males and formed the majority of group ranch membership in Samburu County. This could be attributed to the cultural beliefs of the Samburu people who believed that land could only be inherited and owned by men. This was consistent with the patriarchal nature of the pastoral community such as the Samburu, where men were held with high regards by the society.

The gender disparity with regard to membership of group ranches was due to the fact that men, as heads of households, controlled and managed land. Women became members of group ranches after acquiring land rights through their relationships with men either as wives, daughters or sisters. Similarly, widows, as the executives of their husbands' shares in the group ranches were sometimes permitted to attend meetings

but they were not allowed to address them publicly. In most of the group ranches women were viewed as being incapable of managing productive resources such as land effectively and that land allocated to women was “lost to another family” in the event of marriage, divorce or death. Probably this was the reason why most of the group ranches in Samburu County had not disintegrated and more had applied for incorporation.

However, gender disparity between males and females might have a negative impact on the sustainability of group ranches in Samburu County in the long run. Women play a leading role in the conservation and the preservation of biodiversity. They also perform other tasks like fetching of water, gathering fuel wood and prepare food. Therefore, women are crucial users of resources and their access to, use of and control over land-based resources are essential in ensuring the sustainability of group ranches in Samburu County. They should play significant roles in passing resolutions touching on the choice of sustainability strategies for they provide for the day-to-day needs of their families.

During FGDs, it was revealed that men rarely consulted women on group ranch matters. It was only during annual general meetings when registered female members were allowed to vote on important group ranch matters because of the 60 per cent requirement. This lack of women involvement in decision making in most of the group ranches in the study area might be a stumbling block for the future sustainability of group ranches.

4.1.3 Distribution of the Respondents by Age brackets

The study sought to establish the distribution of respondents by age and the results in Table 4.3 revealed that majority (65.2 per cent) of the group ranch members were aged over 55 years while the youth (below 35 years) were the minority representing 4.6 per cent.

Table 4.3: Age Distribution of the Respondents

Age	Frequency	Percentage
25-34	16	4.6
35-44	50	14.3
45-54	126	36.0
55-64	71	20.3
>65	87	24.9
Total	350	100.0

The study targeted registered members of group ranches and the results in Table 4.3 revealed that majority of the respondents were old men and women. The study established that old members resisted recruiting young members for they feared that the youth would subdivide the land and sell it as it had happened in Kajiado and Narok Counties. It was established that despite attaining the minimum membership age (18 years), very few of the youth had been registered as group ranch members. In some group ranches like Porkwai, Malaso and Suguta Marmar, it was found out that the youth wanted their own land rather than their fathers' shares as they preferred individual production over group production.

Further analyses of the results in Table 4.3 revealed that majority of the registered members were mature and experienced people on matters of group ranches.

The age bracket of 35 years and above indicated that experienced people were involved in making decisions that held group ranches together in Samburu County.

4.1.4 Level of Education of the Respondents

The study sought to establish the level of education of the respondents and results were presented in Table 4.4. Data indicated that 56 per cent of the respondents had attained primary education, 35.1 per cent had attained secondary school level of education and 2.9 per cent had acquired a degree. Only 10 per cent of the respondents indicated that they had other levels of education.

Table 4.4: Level of Education of the Respondents

Level	Frequency	Percentage
Primary	196	56.0
Secondary	123	35.1
Degree	10	2.9
Other	10	2.9
Diploma	7	2.0
Certificate	2	0.6
Adult education	2	0.6
Total	350	100.0

Analysis of data on Table 4.4 revealed that majority of the respondents were literate and understood the questionnaires and interviews without the aid of the researcher.

Illiteracy among respondents would have been a barrier to the understanding of the legal system and procedures of the group ranch system. Without proper education, many members were less likely to participate in the decision making processes. The study established that group ranches in the study area were putting emphasis on education. For instance, Girgir, Ngilai and Losesia group ranches were using revenue accrued from ecotourism to offer school bursaries to the needy children of the members. This strategy enabled the students to clear fees balances and sustained group ranches since the members no longer sold their livestock to pay school fees.

The process of crafting a strategy requires an educated membership that knows where the organization is coming from and where it is going. The policy on group ranches in Kenya required every group ranch to enact a constitution before it was incorporated. This constitution must be passed by the majority of the members of the group ranch. An educated membership would draft a suitable constitution and comprehend the regulations and rules stipulated in the group ranch constitution. Moreover, choices are made from two or more alternatives and the process entails defining the problem such as drought and identifying the criteria to use in solving the problem. In so doing, the member brings his interests, values and similar personal preferences such as livestock into the process. Once the alternatives have been generated, the decision-maker must critically evaluate the alternatives/sustainability strategies and select the best. This kind of exercise requires people with a basic level of education as the success of any organization is critically linked to effective decisions.

The process of choice of sustainability strategies in group ranches is assumed to be rational: The members make decisions under certainty; they know their alternatives; they know their outcomes; they know their decision criteria; and they have the ability

to make the optimum choice and then to implement it. This again requires people who have a formal education.

4.1.5 Income of the Respondents

The study sought to establish the monthly income of the respondents and the results are in Table 4.5. It was established that majority (73 per cent) of the respondents earned a monthly income of less than twenty thousand shillings and only 27 per cent earned twenty thousand shillings and above.

Table 4.5: Monthly Income of the Respondents in Kenya shillings

Income	Frequency	Percentage
<20,000	254	73
20,000-40,000	92	26
41,000-60,000	3	0.8
>60,000	1	0.2
Total	350	100.0

The study established that majority of the respondents had a monthly income fewer than twenty thousand Kenya shillings and accounted for 73 per cent while 26 per cent of them earned between twenty and forty thousand Kenya shillings. Only 1 per cent had a monthly income of more than forty one thousand Kenya shillings.

One of the objectives of establishing group ranches in Kenya was to increase the earning capacity of the members and improve their livelihoods. The government intended to promote social and economic changes in group ranches without disrupting longstanding traditional socio-economic relationships of the ranching communities.

The study established that most of the members earned income from livestock sales and dividends generated from the group ranch activities like eco-tourism. The fact that majority of the respondents earned twenty thousand Kenya shillings and below, most of the members met their basic needs and this led to the sustainability of group ranches in Samburu County.

4.1.6 Membership of the Respondents

The study sought to establish how the respondents became members of the group ranches. The findings in Table 4.6 showed that 83.4 per cent of the respondents became members of the group ranch by birth; 12 per cent attained their membership by marriage; 0.6 per cent attained their membership by buying shares in the group ranch and 4 per cent of the respondents got their membership through inheritance.

Table 4.6: How Members joined the Group Ranch

Membership	Frequency	Percentage
Birth	292	83.4
Marriage	42	12.0
Bought	2	0.6
Inheritance	14	4.0
Total	350	100.0

The study established that it was a policy requirement that all the group ranches in Kenya maintained registers containing the name of each member, the date he became a member and his qualifications for membership. The study found out that majority of the respondents became members of group ranches through birth right. This implied

that land was a critical resource that was central to economic, social and cultural development in Samburu County and a further indication that those who became members by birth would leave behind their land to the heirs upon death hence the need for sustainable management of the group ranches for future generations. In Samburu County, men were rated highly (culturally) as protectors of the community and were allowed to keep livestock and own land.

4.1.7 Main Activities Undertaken by Group Ranches

The study sought to find out the activities that the group ranches were engaged in and the results were presented in Table 4.7. The results indicated that ranching was the main activity as it was being carried out in most of the group ranches, accounting for 78.3 per cent.

Table 4.7: Group Ranch Activities

Activity	Frequency	Percentage
Ranching	274	78.3
Eco-tourism	31	8.9
Ranching and Eco-tourism	35	10.0
Eco -tourism and Mining	3	0.9
Ranching , Eco-tourism and mining	1	0.3
Quarry harvesting	2	0.6
Sand harvesting	2	0.6
Eco-tourism and Sand harvesting	2	0.6
Total	350	100.0

Results in Table 4.7 suggested that ranching and eco-tourism were the main economic activities undertaken by group ranches. In total, they accounted for 97.2 per cent. Other activities like quarry harvesting, sand harvesting and mining were at smaller scales compared to ranching and eco-tourism. This was interpreted to explain the reason behind the choice of conservation activities by most of the group ranches in the study area to take care of eco-tourism. Mining and sand harvesting were carried out at small scales by girgir group ranch, Losesia group ranch, Marti group ranch and Ngilai group ranch.

4.2 Environmental Characteristics and Choice of Sustainability Strategies

The study sought to establish environmental characteristics that determined choice of sustainability strategies adopted by group ranches in Samburu County. The study collected data on rainfall patterns, temperatures, droughts, diseases and floods. Findings from the respondents (Table 4.8) indicated that rainfall patterns had the greatest influence on choice of sustainability, accounting for 42 per cent. It was followed by droughts (24 per cent) and the combined influence of rainfall patterns, temperatures and droughts (18 per cent). Diseases (0.3 per cent) and floods (0.3 per cent) had little influence on choice of sustainability strategies adopted by group ranches in the study area.

Table 4.8: Influence of Environmental Characteristics

Characteristics	Frequency	Percentage
Rainfall patterns	148	42
Temperatures	6	1.7
Droughts	83	24
Diseases	1	0.3
Floods	1	0.3
Rainfall patterns and Temperatures	21	6.0
Rainfall patterns , Temperatures and Droughts	63	18.0
Rainfall patterns , Temperatures , Droughts and Diseases	16	4.6
Rainfall patterns, Temperatures, Droughts, Diseases , Floods	11	3.1
Total	350	100.0

As revealed in Table 4.8, rainfall patterns had the greatest influence (42 per cent) followed by droughts (24 per cent) and in the third position was the combined influence of rainfall patterns, temperatures and droughts at 18 per cent. The results revealed that rainfall patterns and droughts were considered by the respondents to be the main environmental characteristics influencing the choice of sustainability strategies adopted by group ranches in the study area.

The study established that diseases, floods and temperatures had minimal influence on the choice of sustainability strategies adopted by group ranches in the study area as they accounted for 1.7 per cent and 0.3 per cent, respectively. Data analysis further revealed that changes in rainfall patterns and occurrences of droughts were variables that the group ranches considered most when it came to choosing sustainability strategies they adopted.

Due to the environmental characteristics, group ranches adopted stock mobility and conservation strategies to enable them to hold together without dissolving. The stock mobility strategy involved migration of livestock both within Samburu County and outside. The migration patterns within the County included: movement from Girgir group ranch to Losesia group ranch; from Samburu East to Samburu Central, that was Lodogokwe, Kirimun, Kanampiu; Baragoi to Marti; Masikita to Suyani; Nachola to Lomeroko, Turkana border; Tuum to Mt. Nyiro in Samburu North; Wamba to Laresoro; and Lorroki lowland towards Kirisia hills in Samburu Central.

Similarly, migration patterns outside Samburu County included: movement from Samburu East Sub-County to Laikipia North Sub-County; Merille area in Marsabit County; and Merti area in Isiolo County. The degree of livestock mobility varied depending on the aridity so that members of group ranches in the lowlands such as Ngilai, Marti, Elbarta migrated more frequently and further than those in the highlands. For instance, it was reported that during droughts livestock migrated from Samburu County to Laikipia County in search of pasture and water.

The stock mobility strategy enabled the ranchers to make arrangements with their neighbors and even distant herders to share available pasturage, and this sustained group ranches as there was no need to dissolve them. However, the study established

that, sometimes, livestock mobility from Samburu East to Laikipia North and Samburu Central Sub-Counties resulted in resources conflict between Pokot and Samburu Communities in Amayani area. It also led to conflicts between pastoralists from group ranches in Samburu County and the private ranchers in Laikipia County.

The study also established that due to unpredictable environmental characteristics, group ranches in the study area adopted a conservation strategy for sustainability. It was established that some group ranches like Sarara, Losesia, Girgir, Ngotuk Ongiron had conservancies: Namunyak Conservancy (Sarara group ranch); Kalama community conservancy (Girgir group ranch); Sera community conservancy (Losesia group ranch); and Westgate Conservancy (Ngotuk Ongiron Group ranch). Conservation led to the protection of the water catchment areas, wildlife, and vegetation and enabled holistic management of resources resulting in alternative livelihoods, new job opportunities and new markets. The strategy led to sustainability of group ranches as the members benefited from the conservation activities.

4.2.1 Influence of Individual Environmental Characteristics

The study sought to assess the respondents' perception of individual environmental characteristic on the choice of sustainability strategies adopted by group ranches in Samburu County and results are in Table 4.9. It was established that the intensity of influence differed from one characteristic to the other as shown by the following means: droughts (4.631); rainfall patterns (4.711), temperatures (4.616), floods (4.589) and diseases (4.417).

Table 4.9: Intensity of Influence of Individual Environmental Characteristics

Characteristics	NA	LE	ME	GE	VGE	Mean	Std. Dev.
Droughts	15	40	79	180	36	4.631	0.9337
Rainfall patterns	32	17	48	134	119	4.711	0.9781
Temperatures	29	70	32	20	199	4.616	0.7353
Floods	1	5	34	84	226	4.589	0.7522
Diseases	2	16	49	231	52	4.417	0.7146

The respondents indicated that rainfall patterns had the greatest intensity, followed by droughts, and thirdly temperatures. The three characteristics were closely followed by floods and diseases in the fourth and fifth positions.

The study used Durbin-Watson statistics to test the presence of autocorrelation in the residuals and results were presented in Table 4.10. The model accounted for 99.4 per cent of the total observations while 0.6 per cent remained unexplained.

Table 4.10: Model Summary of Environmental Characteristics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.997 ^a	0.994	0.994	0.089	0.187

a. Predictors: (Constant), Rainfall Patterns, Temperatures, Droughts, Floods and Diseases

b. Dependent Variable: Choice of sustainability strategies

The R is the co-efficient value used to show the linear relationship between the dependent (Choice of sustainability strategies) and the independent (Rainfall Patterns, Temperatures, Droughts, Floods and Diseases) variables in the regression

analysis. R-Squared is the coefficient of determination that explains how the various identified characteristics varied with the dependent variable.

The results in Table 4.10 reveal that there was a strong linear association between the dependent and independent variables used in the study. It was shown by a correlation (r) ^a coefficient of 0.997 and the adjusted R-square of 0.994. This implied that rainfall patterns, temperatures, droughts, floods and diseases directly influenced choice of sustainability strategies adopted by group ranches up to 99.4 per cent. While 0.6 per cent of the choices were determined by other environmental characteristics not in the study.

4.2.2 Regression Analysis

The study sought to establish the extent of influence of environmental characteristics on the choice of sustainability strategies adopted by group ranches in Samburu County. By so doing, environmental characteristic with the greatest influence on choice of sustainability strategies, when all environmental characteristics were put together, was identified. Results in Table 4.20 indicate that rainfall patterns had the greatest influence on the choice of sustainability strategies with a regression coefficient of 0.317. It was closely followed by droughts, 0.225; temperatures, 0.200); floods, 0.029 and diseases, 0.196, in that order.

Table 4.11: Regression Coefficients for Environmental Characteristics

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	0.135	0.024		-5.601	0.000
Droughts	0.225	0.006	0.189	39.908	0.000
Rainfall Patterns	0.317	0.005	0.279	59.384	0.000
1 Temperatures	0.200	0.001	0.851	19.560	0.000
Diseases	0.029	0.007	0.019	4.093	0.000
Floods	0.196	0.007	0.126	26.595	0.000

a. Dependent Variable: Choice of Sustainability Strategies

b. Independent Variables: Droughts, rainfall patterns, temperatures, diseases and floods

The results in Table 4.11 show that there was a positive and significant relationship between the dependent variable and the independent variables as shown; drought($\beta = 0.225$, $p=0.000 < 0.05$), rainfall patterns($\beta = 0.317$, $p=0.000 < 0.05$), Temperatures($\beta = 0.200$, $p=0.000 < 0.05$), diseases($\beta = 0.029$, $p=0.000 < 0.05$) and floods ($\beta = 0.196$, $p=0.000 < 0.05$).

The following regression model was fitted to describe the statistical relationship between the independent variables (droughts, rainfall patterns, temperatures, diseases, floods) and the dependent variable (choice of sustainability strategies).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$$

Y= Choice of sustainability strategies

X_1 = Droughts

X_2 = Rainfall patterns

X_3 = Temperatures

X_4 = Diseases

X_5 = Floods

$$Y = 0.135 + 0.225X_1 + 0.317X_2 + 0.200X_3 + 0.029X_4 + 0.196 X_5 + e$$

$$P=0.000$$

The model shows that when environmental characteristics (rainfall patterns, temperatures, droughts, floods and diseases) were at zero, choice of sustainability strategies was at 0.135. Analysis from Table 4.11 reveals that when other factors were held constant, a unit change in droughts resulted in a 0.225 unit change in choice of sustainability strategies such as livestock mobility. For example, the study established that during droughts, the ranches were forced to drive their livestock to areas with pasturage and water especially the highlands like the Mathews Mountains of Wamba in Samburu East. This strategy sustained group ranches because livestock mortality rate reduced.

Similarly, holding floods, diseases and droughts constant, a unit change in rainfall patterns resulted in a 0.317 unit change in the choice of sustainability strategies such as a conservation strategy. For example, a unit change in rainfall patterns resulted in a 0.317 unit change in establishment of a conservancy to conserve wildlife and to protect group ranches from intruders. This sustained group ranches in Samburu County for the ranchers were able to collectively conserve their resources.

Likewise, holding other factors constant, a unit change in temperatures led to a 0.200 unit change in choice of sustainability strategies. For example, herders constructed

shelters to protect their livestock, especially kids, from the effects of high temperatures.

Table 4.11 also shows that a unit change in diseases resulted in a 0.029 unit change in choice of strategies that helped cope with diseases. The ranchers sought veterinary services from the department of veterinary services while others bought drugs and administered them to the livestock. The ability to control livestock diseases made the herders stick to ranching as a livestock production system and this sustained group ranches. The results further indicated that when other factors were held constant, a unit change in floods led to a 0.196 unit change in the choice of sustainability strategies such as keeping off livestock from the flood prone sections of the group ranch. This strategy prevented livestock from being swept by floods and sustained group ranches because ranching thrived.

4.2.3 Testing of Hypothesis

The first hypothesis of this study stated that environmental characteristics had no significant influence on the choice of sustainability strategies adopted by group ranches in Samburu County. The analysis of variance was used to test the null hypothesis and the results were presented in Table 4.12.

Table 4.12: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	428.210	5	85.642	10881.463	0.000 ^b
1	Residual	2.707	344	0.008		
	Total	430.917	349			

Dependent Variable: Choice of Sustainability Strategies

Predictors: (Constant), Diseases, Temperatures, Droughts, Rainfall Patterns and Floods

The ANOVA was used to test the null hypothesis and significance value of $p= 0.000$ was established. Since $P<0.05$, the null hypothesis was rejected and the alternative hypothesis, which stated that environmental characteristics significantly influenced the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya, was accepted.

4.3 Organizational Characteristics and Choice of Sustainability Strategies

An organization is a structured, goal-directed social entity linked to the external environment (Daft, 2007). Organizational characteristics refer to variables such as organization structures, past experiences and past strategies that influence choice of strategies adopted by organizations such as group ranches. Organization structures define how tasks are divided, grouped and co-ordinated (Elbanna & Child, 2007).

This study sought to assess organization structures, past strategies and past experiences determining choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. Results in Table 4.13 reveal that over 60 per cent of the respondents indicated that past experiences had the greatest influence, followed by organization structures with 22 per cent and past strategies were ranked third with 8.6 per cent. On the combined influence of organizational structures, past strategies and past experiences, only 2.5 per cent responded.

Table 4.13: Influence of Organizational Characteristics

Characteristics	Frequency	Percentage
Organizational structures	76	22
Past strategies	30	8.5
Past experiences	235	67
Organizational structure, past strategies and past experiences	9	2.5
Total	350	100

From Table 4.13, the study established that organization structures, past strategies and past experiences influenced the choice of sustainability strategies adopted by group ranches in Samburu County. Organizational structures of majority of group ranches in the study area were flexible and the chain of command was clear. This flexibility facilitated the co-ordination and implementation of group ranch activities.

The study established that all the group ranches had group legal representatives with power to sue and be sued in their corporate names. The members were shareholders of all the group ranch property including the returns from the group ranch projects. This kind of arrangement held group ranches together because the representatives consulted members whenever major decisions were about to be made. It was established that most of the group ranches in the study area had established local governance systems. The strategy involved crafting of rules regarding the running of the affairs of the group ranches, the administration of group property, the registration of new members and the disbursement of funds for group projects. Most of the group ranches held annual general meetings for their members and formed sub-committees to manage various projects. For example, Losesia and Girgir group ranches had

established sub-committees in charge of security, finance, tourism and health. The sub-committees were co-ordinated by the group ranch representatives who were “the supreme governing body” in the organization structure.

The study established that previous experiences, either within the group ranches or from the other group ranches, influenced the choice of sustainability strategies adopted by group ranches in the study area. For example, past experiences like loss of grazing land due to sub-division of some group ranches in the County made majority of group ranches hold together as they did not want land available for ranching to decrease as it had happened to Tinga “A” and Longewani “A” group ranches. When something positive resulted from past experiences, group ranches were more likely to decide in a similar way, given a similar situation. When something negative resulted from a decision, the group ranches avoided repeating past mistakes. For example, Losesia and Girgir group ranches had employed rangers to guard against cattle rustling and to protect wildlife in the conservancies. The strategy had earlier been adopted by Ngutuk group ranch.

The study established that past strategies influenced strategies chosen and adopted by group ranches. Past strategies strongly influenced the choice of future strategies while successful strategies were sustained. Where the adopted strategy showed signs of failure due to changing environment, the group ranches increased their commitment to the adopted strategy. The study established that conservation strategy had been adopted by majority of group ranches in the study area. This had positive effects on pasture and wildlife. For instance, pasture had increased in the conservation areas and was available for grazing during droughts. Likewise, the strategy had conserved wildlife, considered an important input in eco-tourism activities that offered

employment opportunities for the locals. There was increase in forest cover that helped protect water catchment areas and enhanced bee keeping activities.

Therefore, whenever members decided to craft new strategies, they crafted ones that were very close to the past successful strategies. For example, Losesia, Girgir and Ngutuk group ranches had adopted conservation strategy, both as a source of revenue and as a security measure.

4.3.1 Influence of Individual Organizational Characteristics

The study sought to assess the respondents’ perception on individual organizational characteristics on the choice of sustainability strategies adopted by group ranches in Samburu County and results are in Table 4.14. It was established that the intensity of influence differed from one characteristic to the other as shown by the following means: organizational structures (4.351); past experiences (4.647), and past strategies (3.700).

Table 4.14: Intensity of Influence of Individual Organizational Characteristics

Characteristics	NA	LE	ME	GE	VGE	Mean	Std. Dev
Organizational Structures	9	23	55	231	32	4.351	0.835
Past Experiences	2	22	34	213	79	4.647	0.753
Past Strategies	1	23	213	79	34	3.700	1.137

Table 4.14 reveals that the respondents perceived past experiences to have the greatest intensity, with a calculated mean of 4.647, followed by organization structures, with a

calculated mean of 4.351 and thirdly past strategies, with a calculated mean of 3.700. Group ranches in Samburu County survived because they considered past experiences and past strategies before choosing and adopting new strategies. However, this depended on the organization structures put in place. For instance, after experiencing cattle rustling for a long time, Losesia group ranch in Samburu East Sub-County, leased part of its land to a security agent known as Kamanga Holding for protection and revenue generation. The revenue generated from the lease was used to pay school fees for the needy students and buy drugs for livestock. Kamanga Holding offered security, not only to the livestock, but also to members. Therefore, the group ranches considered the past experiences and the past strategies for sustainability.

The study used Durbin-Watson statistics to test the presence of autocorrelation in the residuals and results were presented in Table 4.15. The model showed a strong linear association between organizational characteristics (past experiences, organizational structures and past experiences) and choice of sustainability strategies as indicated by r of 0.773.

Table 4.15: Model Summary of Organizational Characteristics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.773 ^a	0.598	0.594	0.342	1.665

Predictors: (Constant), Past Strategies, Organizational Structures, Past Strategies

Dependent Variable: Choice of sustainability strategy

From Table 4.15, the coefficient of determination as measured by the adjusted R-square (0.594) indicated that past strategies, organizational structures, past strategies influenced up to 59.4 per cent choice of sustainability strategies adopted by the group ranches while 40.6 per cent were as a result of other organizational characteristics not in the study.

4.3.2. Regression Analysis

The study used regression analysis to find out the extent to which the organizational characteristics influenced the choice of sustainability strategies adopted by group ranches in Samburu County when they were all put together. Further, the study sought to establish which of the organizational characteristics had the greatest influence when they were all put together. Results in Table 4.16 reveal that past experiences had the greatest influence on the choice of sustainability strategies with a regression coefficient of 0.432. It was closely followed by organization structures (0.289) and past strategies (0.110) in that order.

Table 4.16: Regression Coefficient for Organizational Characteristics

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	0.793	0.099		7.999	0.000
Past strategies	0.110	0.021	0.203	5.292	0.000
1 Organization structures	0.289	0.023	0.451	12.566	0.000
Past experiences	0.432	0.026	0.615	16.770	0.000

-
- a. Dependent Variable: Choice of sustainability strategies
 - b. Independent Variables: Past strategies, Organization structures and Past Experiences.

The results in Table 4.16 indicate that there was a positive and significant relationship between the dependent variable and the independent variables as shown; past strategies($\beta=0.110, p=0.000<0.05$), past experiences ($\beta = 0.432, p=0.000<0.05$).and organizational structures($\beta=0.289, p=0.000<0.05$).

The following regression model was fitted to describe the statistical relationship between the independent variables (past strategies, organization structures and past experiences) and the dependent variable (choice of sustainability strategies).

$$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+e$$

Y= Choice of Sustainability Strategies

X₁= Past Strategies.

X₂=Organization Structures

X₃=Past Experiences.

$$Y= 0.793 + 0.110X_1 + 0.289X_2 + 0.432X_3+e \quad P=0.000$$

The model illustrated that when organizational characteristics (organization structure, past strategies and past experiences) were at zero, the choice of sustainability strategies was at 0.793. Holding other factors constant, a unit change in past strategies resulted in a 0.110 unit change in the choice of sustainable strategies. Similarly, a unit change in organization structures resulted in a 0.289 unit change in the choice of sustainability strategies. A unit change in past experiences led to a 0.432 unit change in the choice of sustainability strategies. The study established that the majority of group ranches in Samburu County embraced a consultative and participatory approach

while choosing and adopting sustainability strategies. This participatory strategy held group ranches together.

4.3.3 Testing of Hypothesis

The second hypothesis of the study stated that there was no significant influence of organizational characteristics on the choice of sustainability strategies adopted by group ranches in Samburu County. The analysis of variance was used to test the null hypothesis and the results are presented in Table 4.26.

Table 4.17: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	59.936	3	19.979	171.265	0.000 ^b
1	Residual	40.362	346	0.117		
	Total	100.299	349			

Predictors: (Constant), Past strategies, Organizational Structures, Past Strategies

Dependent Variable: Choice of Sustainability Strategies

The analysis in Table 4.17 established a significance value of $p=0.000$. Since $P<0.05$, the null hypothesis was rejected and the alternative hypothesis which stated that there was a significant influence of organizational characteristics on choice of sustainability strategies adopted by group ranches in Samburu County, was accepted. Therefore, the study established that organizational characteristics influenced the choice of sustainability strategies adopted by the group ranches in the study area.

4.4 Societal Characteristics and Choice of Sustainability Strategies

Organizations such as group ranches operate within the broader society (Thornton & Doming, 2011). Societal characteristics refer to variables such as culture, education,

and lifestyles. The study examined the influence of culture, education and lifestyles on choice of sustainability strategies adopted by group ranches in the study area. Among the pastoral communities such as the Samburu, ranching is both a cultural and economic activity.

Results in Table 4.18 reveal that 71.4 per cent of the respondents indicated that culture had the greatest influence, followed by a level of education with 24.3 per cent and lastly lifestyles with 4.3 per cent.

Table 4.18: Influence of Societal Characteristics

Characteristics	Frequency	Percentage
Culture	250	71.4
Level of Education	85	24.3
Lifestyles	15	4.3
Total	350	100

Analysis of Table 4.18 reveals that culture, level of education and lifestyles influenced the choice of sustainability strategies adopted by the group ranches in Samburu County. The study established that group ranch members considered their culture and lifestyles in choosing the strategies they adopted which were dependent on their level of education. It was established that ranching was not only an important source of income and food but also a cultural entity. Therefore, any strategy that would impact negatively upon the culture and lifestyles of the members was resisted.

During interviews with the Key Informants, it was established that ranching was a long standing tradition that maintained cultural heritage and was an integral part of most of the group ranchers' lives. It was considered to be a lifestyle and the members

felt that it was not a job but a way of life. It was because of this perception that any strategies that the members thought would introduce drastic changes in the members' cultural beliefs and lifestyles would be resisted. For instance, initially, there was resistance to the formation of strategic alliances between group ranches in Samburu County and the Northern Rangeland Trust (NRT), a body established in 2004 to assist communities to conserve and improve environmental management skills as a means of improving and diversifying livelihoods. The members thought that by diversifying livelihoods, ranching would be affected and lose its cultural meaning. It was after several seminars and sensitization barazas were held that the idea of forming strategic alliances between group ranches and the NRT in the study area was accepted. Finally the NRT extended financial support to the group ranches and this sustained them.

4.5.1 Influence of Individual Societal Characteristics

The study sought to assess the respondents' perception of culture, level of education and lifestyles on the choice of sustainability strategies adopted by group ranches in Samburu County. It was established that the intensity of influence differed from one characteristic to the other (Table 4.19).

Table 4.19: Intensity of Influence of Individual Societal Characteristics

Characteristics	NA	LE	ME	GE	VGE	Mean	Std. Dev.
Culture	6	15	20	221	34	3.715	0.746
Level of Education	19	25	46	180	26	3.571	0.989
Lifestyles	10	52	155	55	24	3.495	0.902

The findings in Table 4.19 reveal that individual societal characteristics greatly influenced the choice of sustainability strategies. However, culture had the greatest influence, with a mean of 3.715. The level of education and lifestyles were ranked second and third with means of 3.571 and 3.495, respectively. The study established that group ranches in Samburu County survived because they chose and adopted strategies that were in conformity with the cultural values and lifestyles of the members.

The study used Durbin-Watson statistics to test the presence of autocorrelation in the residuals and results were presented in Table 4.20. The model showed the association between the societal characteristics (culture, level of education and lifestyles) and choice of sustainability strategies. The three societal variables accounted for 92.1 per cent of the total observations while 7.9 per cent were unexplained by the model.

Table 4.20 Model Summary of Societal Characteristics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.960 ^a	0.921	0.921	0.16718	1.384

Predictors: (Constant), Lifestyles, Level of Education, Culture

Dependent Variable: Choice of Sustainability Strategies

Analysis of Table 4.20 reveals that there was a strong linear association ($r=0.960$) between the dependent and independent variables used in the study. The coefficient of determination as measured by the adjusted R-square, revealed that culture, level of education and lifestyles directly influenced the choice of sustainability strategies

adopted by the group ranches in Samburu County by up to 92.1 per cent. About 7.9 per cent of the choices were determined by other societal characteristics.

4.4.2 Regression Analysis

The study used regression analysis to establish the extent to which societal characteristics influenced the choice of sustainability strategies adopted by group ranches in Samburu County when they were all put together. Further, the study sought to establish which of the societal characteristics had the greatest influence when they were all put together. Results in Table 4.21 reveal that culture had the greatest influence on choice of sustainability strategies with a regression coefficient of 0.374. It was closely followed by the level of education with a regression coefficient of 0.341 and lifestyles with a regression coefficient of 0.306, in that order.

Table 4.22: Regression Coefficients for Societal Characteristics

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	0.063	0.053		-1.195	0.233
1 Culture	0.374	0.010	0.637	37.600	0.000
Level of Education	0.341	0.016	0.353	21.471	0.000
Lifestyles	0.306	0.011	0.464	27.292	0.000

Predictors: (Constant), Culture, Level of Education, Lifestyles

Dependent Variable: Choice of Sustainability Strategies

The results in Table 4.22 indicate that there was a positive and significant relationship between the dependent variable and the independent variables as shown; culture ($\beta=0.374$, $p=0.000<0.05$), lifestyles($\beta=0.306$, $p=0.000<0.05$) and level of education ($\beta = 0.341$, $p=0.000<0.05$).

The following regression model was fitted to describe the statistical relationship between the independent variables (culture, level of education and lifestyles) and the dependent variable (choice of sustainability strategies).

$$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+e$$

Y= Choice of Sustainability Strategies

X₁= Culture.

X₂= Level of Education.

X₃= Lifestyles.

$$Y= 0.063 + 0.374X_1 + 0.341X_2 + 0.306X_3+ e \quad P=0.000$$

From the model, when cultures, level of education, lifestyles were at zero, the choice of sustainability strategies was at 0.063. The model indicates that when other societal characteristics were held constant, a unit change in culture led to a 0.374 unit change in the choice of sustainability strategies. Similarly, a unit change in the level of education resulted in a 0.341 unit change in the choice of sustainability strategies adopted by group ranches in Samburu County. Likewise, it was established that a unit change in lifestyles resulted in a 0.306 unit change in the choice of sustainability strategies adopted by group ranches in Samburu County. Overall, the study established that societal characteristics influenced the choice of sustainability strategies adopted by the group ranches in Samburu County.

4.4.3 Testing of Hypothesis

The third hypothesis of the study stated that societal characteristics had no significant influence on the choice of sustainability strategies adopted by group ranches in Samburu County. The analysis of variance was used to test the null hypothesis and the results were presented in Table 4.31.

Table 4.23: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	96.067	3	32.022	1145.694	0.000 ^b
1	Residual	8.161	292	0.028		
	Total	104.228	295			

Predictors: (Constant), Lifestyles, education, culture

Dependent Variable: Choice of sustainability strategies

Data on Table 4.23 indicates that the significance value of $p=0.000$ was established. Since $P < 0.05$, the null hypothesis was rejected and the alternative hypothesis which stated that societal characteristics had a significant influence on the choice of sustainability strategies adopted by group ranches in Samburu County was accepted.

4.5 Management Characteristics and Choice of Sustainability Strategies

The term management has been defined differently. Daft (2010) defined it as the attainment of organizational goals in an effective and efficient manner through planning, organizing, leading and controlling organizational resources; Lewis, Goodman, Fandt, and Michlitsch (2007) defined management as knowing how to allocate resources efficiently to accomplish organizational goals and to keep those goals in tune with the changing environment. Robbins and Coutler (2005) defined management as the efficiency and effectiveness in attaining organizational goals.

In this study, the term management characteristics was used to refer to the attributes associated with the group ranch representatives who acted as the management of group ranches. Although they were also members, they were elected by the other members to manage the affairs of the group ranches. To find out the influence of management characteristics on the choice of sustainability strategies, the study sought information on the influence of the level of education, the tenure of office and the experience of the management(group ranch officials) on the choice of sustainability strategies adopted by group ranches in the study area.

As shown in Table 4.32, 40 per cent of respondents indicated that level of education in the management had the greatest influence on the choice of sustainability strategies adopted by group ranches, followed by experience at 24 per cent and change in management at 19 per cent. The tenure of office had the least influence at 18 per cent.

Table 4.24 Influence of Management Characteristics

Characteristics	Frequency	Percentage
Level of Education of Management	140	40
Tenure of Office	65	18
Experience in Leadership	80	23
Change in Management	65	19
Total	350	100

From Table 4.24, the study established that level of education, tenure of office, experience and change in management influenced the choice of sustainability strategies adopted by group ranches in Samburu County.

4.5.1 Influence of Individual Management Characteristics

The study sought to assess respondents’ perception about the individual management characteristics and the results are presented in Table 4.25. It was established that the intensity of influence differed from one characteristic to the other as shown by the following means: level of education (3.580); experience in leadership (3.565); tenure of office (3.137) and change in management (3.154).

Table 4.25 Intensity of Influence of Individual Management Characteristics

Characteristics	NA	LE	ME	GE	VGE	Mean	Std. Dev.
Level of Education	4	10	91	208	31	3.580	0.763
Tenure of Office	1	25	257	38	29	3.137	0.721
Experience in Leadership	15	18	29	246	42	3.565	0.939
Change in Management	6	30	245	44	25	3.154	0.783

As indicated in Table 4.25, the respondents perceived the level of education to have the greatest intensity, with a mean of 3.580. Experience in leadership, change in management and tenure of office were ranked second, third and fourth with means of 3.565, 3.137 and 3.137, in that order.

The study used Durbin-Watson statistics to test the presence of autocorrelation in the residuals and the results are in Table 4.26. The study established a strong association ($r=0.998$) between management characteristics and choice of sustainability strategies. The four management variables accounted for 99.7 per cent of the total observations while 0.3 per cent was unexplained by the regression model.

Table 4.26: Model Summary of Management Characteristics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.998 ^a	0.997	0.997	0.03209	0.398

Predictors: (Constant), change in management, experience in leadership, tenure of office, level of education

Dependent Variable: Choice of Sustainability Strategies.

Analysis of Table 4.26 reveals that there was a strong linear association ($r=0.998$) between the dependent and independent variables used in the study. The coefficient of determination as measured by adjusted R-square revealed that change in management, experience in leadership, tenure of office and the level of education influenced the choice of sustainability strategies adopted by group ranches in Samburu County by up to 99.7 per cent. About 0.3 per cent of the choices were determined by other management characteristics.

4.5.2 Regression Analysis

The study used regression analysis to find out the extent to which management characteristics influenced the choice of sustainability strategies adopted by group ranches in Samburu County when they were all put together. Further, the study sought

to establish which of the management characteristics had the greatest influence when they were all put together. Results in Table 4.27 reveal that level of education had the greatest influence on choice of sustainability strategies with a regression coefficient of 0.316. It was followed by experience in leadership (0.255), change in management (0.248) and tenure of office (0.142), in that order.

Table 4.27: Regression Coefficients of Management Characteristics

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	0.076	0.008		9.000	0.000
Experience	0.255	0.003	0.354	99.809	0.000
1 Tenure of office	0.142	0.006	0.230	22.872	0.000
Change in management	0.248	0.002	0.422	12.177	0.000
Level of education	0.316	0.007	0.454	44.893	0.000

a. Independent variables: Experience in leadership , Tenure of office, change in management , level of education

b. Dependent Variable: Choice of Sustainability Strategies

The results in Table 4.27 show that there was a positive and significant relationship between the dependent variable and the independent variables as indicated; experience ($\beta=0.255$, $p=0.000<0.05$), tenure of office($\beta=0.142$, $p=0.000<0.05$), change in management($\beta=0.255$, $p=0.000<0.05$) and level of education ($\beta = 0. 316$, $p=0.000<0.05$).

The following regression model was fitted to describe the statistical relationship between the dependent variable (choice of sustainability strategies) and the independent variables (experience, tenure of office, succession, education):

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Y= Choice of sustainability strategies

X₁= Experience in leadership

X₂= Tenure of office

X₃= Change in management

X₄= Level of education

$$Y = 0.076 + 0.255X_1 + 0.142X_2 + 0.248X_3 + 0.316X_4 + e \quad P=0.000$$

From the model, when management characteristics are at zero, the choice of sustainability strategies will be at 0.076. When other factors are held constant, a unit change in experience in leadership would lead to a 0.255 unit change in the choice of sustainability strategies.

Similarly, a unit change in tenure of office would lead to a 0.142 unit change in choice of sustainability strategies. The study also established that a one unit change in change in management would lead to a 0.248 unit change in the choice of sustainability strategies. A unit change in the level of education would lead to a 0.316 unit change in choice of sustainability strategies. This implied that management characteristics influenced choice of sustainability strategies adopted by group ranches in Samburu County. An educated and experienced management is required for the formulation of plans, programmes and strategies aimed at sustaining group ranches.

4.5.3 Testing of Hypothesis

The fourth hypothesis of the study stated that management characteristics had no significant influence on the choice of sustainability strategies adopted by group ranches in Samburu County. The Analysis of Variance was used to test the null hypothesis and the results were presented in Table 4.28.

Table 4.28: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	105.652	4	26.413	25646.007	0.000 ^b
1	Residual	355	345	0.001		
	Total	106.007	349			

Predictors: (Constant), Change in Management, Experience in Leadership ,
Tenure of Office, Level of Education

Dependent Variable: Choice of Sustainability Strategies

From Table 4.28, significance value of $p= 0.000$ was established and since the p -value was less than 0.05, the null hypothesis was rejected and the alternate hypothesis accepted. Therefore, it was concluded that management characteristics significantly influenced the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya.

4.6 Moderating Variables and Choice of Sustainability Strategies

A moderating variable is a variable that changes (reduces or enhances) the direction of the relationship between the independent and dependent variables. It may even change the direction of the relationship between the two variables from positive to negative or vice versa (Kothari, 2004).

The study sought to establish whether policy requirements and politics changed the direction taken by the group ranches on the choice of sustainability strategies.

4.6.1 Policy Requirements and Choice of Sustainability Strategies

Policy requirements entailed government regulations and rules such as tax policy, employment law and environmental regulations. The study sought to determine how the policy requirements regarding incorporated group ranches moderated the choice of sustainability strategies adopted by the group ranch and the findings were as indicated in Table 4.29

Table 4.29: Moderating Effect of Policy Requirements

Moderating effect	Frequency	Percentage
Positively	283	80.9
Negatively	22	6.3
Neutral	30	8.6
No effect at all	15	4.3
Total	350	100

The findings in Table 4.29 revealed that policy requirements regarding incorporated group ranches had moderating effects on the choice of sustainability strategies adopted by the group ranches in Samburu. Over 80 per cent of the respondents reported that policy requirements enhanced the choice of sustainability strategies. Only 6.3 per cent of the respondents indicated that policy requirement negatively influenced the choice of sustainability strategies adopted by group ranches. The rest of the respondents (12.9 per cent) indicated that policy variables had either neutral or no effect at all on the choice of sustainability strategies.

This implied that policy requirements enhanced and/or reduced implementation of sustainability strategies adopted by group ranches in Samburu County. For example, some members in the study area viewed the policy on destocking through periodic livestock sales, to achieve proper carrying capacity, negatively. Although this seemed a sustainable strategy, some members disliked it because they believed that having more livestock was prestigious and reduced the risk of completely losing livestock during droughts.

The policy requiring all group ranches to have Annual General Meetings had a moderating effect on the choice of sustainability strategies because the group ranch representatives had to wait until such meetings were held before implementation. The study established that there was a day when sharing of school bursaries for Ngilai group ranch, in Samburu North, delayed due to lack of an Annual General Meeting. It took the intervention of the registrar of group representatives who called for a special general meeting to resolve the stalemate. After the meeting, bursaries were distributed to the needy and deserving students without further delay. Similarly, the policy requiring a majority of members to pass a resolution was participatory and held group ranches together, without disintegrating.

The study established that some group ranch members wanted the policy on group ranches changed to allow for individual land ownership as well as communal land ownership in an area (same group ranch). This was pointed out by participants during Focus Group Discussions, where the youth advocated for individual allocation of small plots in a group ranch and the remaining portions to be used for communal grazing.

The study, therefore, concluded that policy requirements had a moderating effect on the choice of sustainability strategies adopted by group ranches in Samburu County.

4.6.2 Politics and Choice of Sustainability Strategies

The study sought to establish the moderating effect of politics on the choice of sustainability strategies adopted by the group ranches in Samburu County. The findings were presented in Table 4.30.

Table 4.30: Moderating Effect of Politics

Moderating Effect	Frequency	Percentage
Positively	192	54.9
Negatively	46	13.1
Neutral	96	27.4
No effect at all	16	4.6
Total	350	100.0

Analysis of data on Table 4.30 reveals that politics had positively moderated the choice of sustainability strategies adopted by group ranches with the majority (54.9 per cent) of the respondents stating that it had a positive moderation. Only 13.1 per cent of the respondents were of the opinion that politics had negatively affected the choice of sustainability strategies. The study established that there was political interference on the operations of most of the group ranches in the study area. It was reported that some officials from the Samburu County Government supported group ranches owned by their ethnic communities. Similarly, officials of Losesia group ranch reported that there was politics behind a case filed at the Nyeri High Court challenging their leadership. The plaintiffs, who came from a different ethnic

community, claimed that the officials had allocated tracts of land to some members who later sold to outsiders hence reducing in size their grazing fields. The court placed an injunction against further development in the affected area. Therefore, the study established that politics had a moderating role to play in the choice of sustainability strategies adopted by group ranches in Samburu County.

4.6.3 Influence of Individual Moderating Variables

The study further sought to assess the respondents' perception of the moderating variables on the choice of sustainability strategies and the results are presented in Table 4.31.

Table 4.31: Effect of Individual Moderating Variables

Moderating Variable	Mean	Std. Dev.
Policy requirements	3.709	0.908
Politics	3.614	0.939

Data on Table 4.31 revealed that policy requirements had the greatest moderating effect on the choice of sustainability strategies with a mean of 3.709 compared to politics which had a mean of 3.614. This implied that although environmental, societal, management and organizational characteristics influenced the choice of sustainability strategies adopted by group ranches in Samburu County, policy requirements and politics affected the direction and strength of the influence.

4.7 Intervening Variables and Choice of Sustainability Strategies

Intervening/ mediating /intermediary variables are variables that explain a relation or provide a causal link between other variables. They are variables which explain how and why independent variables affect the dependent variables (Kothari, 2004). The study sought to establish how resources and competition influenced the association between independent variables and dependent variable.

4.7.1 Resources and Choice of Sustainability Strategies

The central premise for the resource-based view theory in strategic management is that business enterprises compete on the basis of their resources and may use their resources to compete. The theory emphasizes the firm's resources as the fundamental determinants of performance (Peteraf & Bergen, 2003).

In identifying the intervening variables, the study sought to find out the resources held by group ranches in Samburu County. When asked to mention the resources held by the group ranches in the study area, the respondents gave multiple responses as indicated in Table 4.32 and Figure 4.1. During data analysis, the number of times a resource was mentioned was considered and the frequency distribution that was generated presented the incidences that a given resource was selected.

Table 4.32: Distribution of Group Ranch Resources

Resource	Frequency	Percentage
Livestock	350	100
Minerals	50	14
Solar energy	60	17
Wildlife	300	86
Employees	40	11
Wind energy	50	14
Forests	100	28
Water	100	28
Land	350	100
Sand	100	28
Pasture	200	51

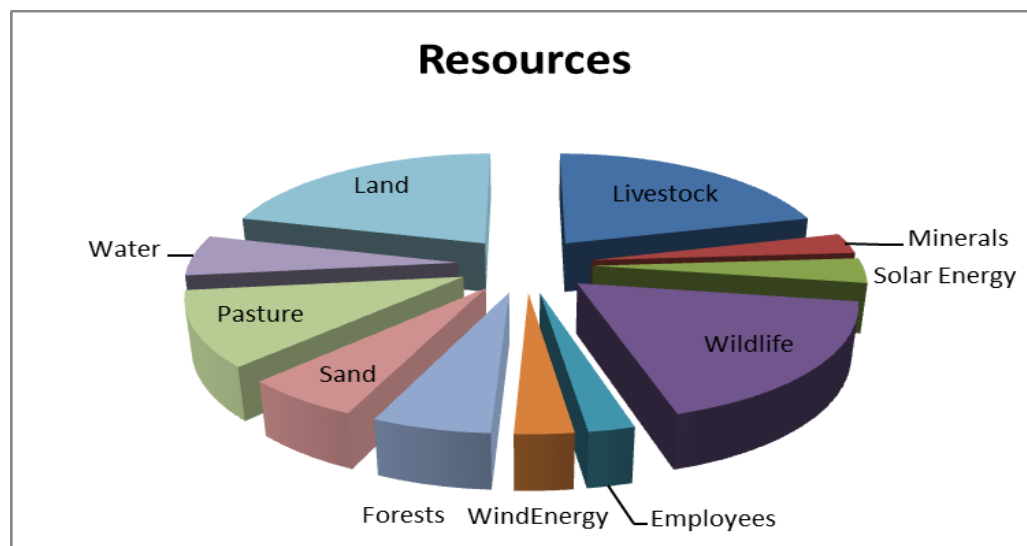


Figure 4.1: Distribution of Group Ranch Resources

Data on Table 4.32 and Figure 4.1 indicate that the respondents mentioned land, livestock, minerals, forests, water, pasture, sand, solar energy, wind energy, sand and employees as resources found in the group ranches in the study area. Livestock and land were the commonest resources identified by the respondents at 100 per cent. They were closely followed by wildlife at 86 per cent and forest and water were ranked the third position. This implied the importance of the identified resources.

4.7.2 Effect of Resources on Choice of Sustainability Strategies

The study further sought to establish how the identified resources affected the relationship between environmental, organizational, management and societal characteristics and choice of sustainability strategies adopted by the group ranches in the study area. The results were as shown in Table 4.33.

Table 4.33: Effect of Intervening Variables on Choice of Sustainability strategies

Intervening Variables	Mean	Std. Dev.
Livestock	3.62	1.62
Wildlife	3.79	1.04
Water	4.33	0.66
Employees	3.92	0.80
Forests	3.68	0.94
Sand	3.48	1.16
Solar energy	3.49	0.72
Wind energy	3.54	0.96
Land	3.36	1.36

Data on Table 4.33 revealed that the identified resources had an intervening influence on the choice of sustainability strategies adopted by the group ranches in the study area. The resources had a varied extent of influence: livestock had a mean of 3.62; water a mean of 4.33; employees a mean of 3.92; forest a mean of 3.68. All the resources mentioned were likely to have an effect on the proposed relationship between the independent (environmental, organizational, societal and management) and dependent (choice of sustainability strategies) variables.

The study established that most of the group ranches had committees elected by the members to manage the use of resources. Before the formation of group ranches, traditional pastoral systems had some form of “private” control over resources like water whereby many water points were owned by individual families or clans. This brought conflict between families and clans.

The study, therefore, established that although there was a statistical association between environmental, organizational, management and societal characteristics and choice of sustainability strategies, the degree of association depended on the availability of resources. For instance, just because group ranches had experienced and educated group ranch officials did not necessarily mean that would lead to a choice of a sustainability strategy. It would depend also on the available resources and how wisely the resources were used.

4.7.3 Competition and Choice of Sustainability Strategies

Organizations operate in a competitive and changing external environment. Most of them compete for resources while others may use resources to compete (Acquaah,

2003). Competition occurs when two or more organizations act independently to supply goods and services to the same clients (Barney, 2001).

This study sought to establish the effect of competition on the association between the environmental, organizational, management and choice of sustainability strategies adopted by the group ranches in Samburu County.

Table 4.34: Effect of Competition

Effect of competition	Frequency	Percentage
Positively	227	64.9
Negatively	39	11.1
Neutral	13	3.7
No effect at all	71	20.3
Total	350	100

Results in Table 4.34 reveal that 20.3 per cent of the respondents believed that competition had no intervening effect on the choice of sustainability strategies adopted by the group ranches. However, the same results indicated that 64.9 per cent of the respondents felt that competition had a positive effect on the association between environmental characteristics, organizational characteristics, management characteristics and organizational characteristics, and the choice of sustainability strategies adopted by the group ranches in the study area. The study established that the group ranches competed for resources like pasture, wildlife, water and even conservancies. For instance, in the year 2004 there was conflict over Ltungai conservancy, along the boundary of Pokot West Sub-County and Samburu West Sub-

County. The competition was over pastures and water among the Samburu and Pokot communities.

4.7.4 Summary of Hypothesis Testing

Hypothesis testing in this study was formulated using the H_0 null hypotheses and was performed at a significance level of 0.05. The Analysis of Variance was used to test the four hypotheses and the p-value method was used to either reject or accept them. The first hypothesis stated that environmental characteristics had no significant influence on the choice of sustainability strategies adopted by group ranches in Samburu County. Upon testing, a p-value of 0.00 was obtained and hypothesis rejected since $p=0.00 < 0.05$. Therefore, environmental characteristics were found to have an influence on the choice of sustainability strategies adopted by group ranches in Samburu County.

The second hypothesis stated that there was no significant influence of organizational characteristics on the choice of sustainability strategies adopted by group ranches in Samburu County. The Analysis of Variance was used to test the hypothesis and a p-value of 0.00 was obtained. Subsequently, the hypothesis was rejected since $p=0.00 < 0.05$. Therefore, there was a significant influence of organizational characteristics on the choice of sustainability strategies adopted by group ranches in Samburu County.

The third hypothesis of the study stated that societal characteristics had no significant influence on the choice of sustainability strategies adopted by group ranches in Samburu County. Upon testing, a p-value of 0.00 was obtained and subsequently the hypothesis was rejected since $p=0.00 < 0.05$. Therefore, organizational characteristics

significantly influenced the choice of sustainability strategies adopted by group ranches in Samburu County.

The fourth hypothesis of the study stated that management characteristics had no significant influence on the choice of sustainability strategies adopted by group ranches in Samburu County. Analysis of Variance was used to test the hypothesis and a p-value of 0.00 was obtained. Since the $P=0.00 < 0.05$, the hypothesis was rejected. Therefore, it was concluded that management characteristics significantly influenced the choice of sustainability strategies adopted by group ranches in Samburu County.

In conclusion, all the four hypotheses had p-values of 0.00 that were less than the significance value of 0.05 used for testing. Subsequently, it was found out that environmental, organizational, management and societal characteristics influenced choice of sustainability strategies adopted by group ranches in Samburu County.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

This chapter presents a discussion of findings, conclusions and recommendations emanating from the research. It also presents suggested areas for further research.

5.1 Discussion of Findings

The purpose of this study was to establish determinants of choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. The research was triggered by provisions of Article 60(1) of the Constitution of Kenya (2010) that advocated for productive and sustainable management of land, putting in place strategies to conserve and protect the ecologically fragile rangelands of Kenya. About 80 per cent of the Country (covering 29 out of the 47 Counties) has been classified as arid and semi-arid lands (ASALs).

The system of group ranches is considered to be one of the best strategies of owning land and keeping livestock in the rangelands. As a result, numerous studies have been conducted on the formation, coping, dissolution and subsequent subdivision strategies involving group ranches. However, the aspect of sustainability and choice of sustainability strategies applied by group ranches has received little attention from these studies. The study targeted Samburu County because it is one of the Counties of Kenya classified as arid and semi-arid with a substantial number of group ranches having been established where most of the land is held and used communally in undivided shares.

The study established that formation of group ranches in Kenya took place in the early 1960s to allow communities living in the rangeland Counties of Samburu, Laikipia, Taita Taveta, Kitui, Baringo, West/Pokot, Narok, Kajiado, Embu, Kilifi, Kwale, Kericho and Siaya, to jointly own and manage land in a sustainable manner. The government provided group ranches with infrastructural facilities such as schools, hospitals and cattle dips. The Land (Group Representatives), Act, Cap 287, Laws of Kenya provided the legal framework for the establishment and operations of group ranches (Mwangi, 2007b).

However, by mid-1970s, some group ranches had dissolved, subdivided and issued individual title deeds to their members. From the onset, it seemed, the establishment of group ranches gave little attention to the concept of sustainability and choice of sustainability strategies because most of them dissolved within a short period. This was attributed to the mistrust that some members had on the existing land laws and the hurriedly formulated regulations governing the group ranch concept that gave little consideration of the implications of the system on the people living in the rangelands which made up 80 per cent of Kenya's total land surface (Ntiati, 2002). In Samburu County, for instance, land adjudication process and establishment of group ranches was initially resisted by the communities living in the County (Lesorogol, 2008).

This study focused on the aspect of sustainability and choice of sustainability strategies by identifying, analyzing and documenting environmental, organizational, societal and management characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya.

5.1.1 Environmental Determinants of Choice of Sustainability Strategies.

The study analyzed the influence of temperatures, rainfall patterns, droughts, floods and diseases on the choice of sustainability strategies adopted by group ranches in the study area. It was found out that a strong relationship existed between the group ranches and the environment since the physical environment was the main source of land-based resources required for the survival and sustainable management of group ranches.

The study revealed that environmental characteristics such as the variability of rainfall patterns, high temperatures, droughts and diseases largely influenced the choice of sustainability strategies adopted by group ranches in Samburu County. In other words, the study established that the strategies chosen and applied by group ranches in Samburu County were largely influenced by the physical environment and their survival would depend on the choice of sustainability strategies adopted to reduce the risks caused by unreliable rainfall patterns, droughts, extreme temperatures and diseases. For instance, due to unreliable rainfall patterns and droughts, most group ranches in the study area adopted livestock production strategy instead of crop production strategy because the crop production strategy required more reliable rainfall patterns. However, a few group ranches such as Porokwai, Suguta-Murmar and Losuk practiced crop farming but planted drought tolerant and early maturing crops like green grams and sorghum.

Further, the study established that group ranches in the study area chose and adopted stock mobility, livestock diversification, herd dispersion, herd maximization and reservation for rich-patch strategies due to unreliable and unpredictable rainfall patterns, periodic droughts and high temperatures. Stock mobility strategy included

migration of livestock within and without the County in search of water and pasture. Within Samburu County, patterns of livestock migration included moving livestock from one group ranch to another. For example, livestock would move from Losesia group ranch to Girgir group ranch, both in Samburu East Sub-County.

Other times, livestock would migrate from one Sub-County to another Sub-County in search of water and pasture. For instance, livestock migrated from Samburu East (a relatively dry area) to Samburu Central around Kirimon and Lodogokwe areas where pasture was available during the dry period ; in Samburu North, livestock migrated from Baragoi to Marti; Masikita to Suyani; Nachola to Lomeroko, and to the boundary of Samburu County with Turkana County. Livestock also migrated from Tuum area to the area around Mt. Nyiro. Similarly, livestock would move from Wamba in Samburu East to Laresoro area; and from Lorroki lowlands towards Kirisia hills in Samburu Central.

Outside Samburu County, livestock would migrate to Laikipia, Marsabit (Merille area) and Isiolo (Merti area) Counties. It was revealed that most of these migrations were usually preceded by movement of scouts who went ahead of livestock to assess the availability and quality of pasture in the areas the livestock was expected to move to. The scouts collected information and gave feedback on the grazing potentials of the areas before the migration of livestock took place. The strategy to move livestock from one area to another increased resilience of the animals to adverse climatic conditions such as droughts and high temperatures. The strategy held group ranches together because it reduced the risk of livestock losses suffered during droughts. The survival of the animals was important because ranching was the main economic activity with a direct bearing on the sustainability of group ranches.

However, the study noted that the degree of livestock mobility varied depending on the aridity in the study area so that members of group ranches in the lowlands such as Marti, Ngilai and Elbarta migrated more frequently and further than those in the highlands like the Mathews Mountains in Wamba. For instance, it was established that during droughts, livestock migrated from Samburu County to Laikipia County in search of water and pasture. This strategy also ensured that the animals were supplied with water, got fresh pastures and as well as avoiding overgrazing.

The study established that given the unpredictable exposure to the effects of droughts and diseases, livestock diversification strategy was adopted to cushion the ranchers against huge livestock losses caused by recurring droughts. The strategy involved rearing more than one species of livestock to generate a wider variety of livestock products and make better use of the available forage in different seasons, even in times of crisis. The strategy included a combination of different livestock species like goats, sheep, donkeys, camels and cattle, as well as a mixture of commercial chicken and indigenous chicken to reduce the risk of total loss when diseases and other risks struck. Additionally, different livestock species ensured the efficient and sustainable use of available pasture resources because different species had non-competitive grazing and browsing habits. This strategy held group ranches together as it minimized the risks of total loss of livestock.

The 'herd dispersion strategy' involved spreading one's livestock to several localities to counteract local risks of droughts and diseases. It included dividing livestock into herding units or giving some livestock to relatives or neighbors. The strategy led to

the sustainability of group ranches because it reduced competition for water and forage among herds, thus optimizing the use of pasture.

The 'herd maximization strategy' involved keeping as many animals as possible to ensure their survival despite losses incurred during droughts or disease outbreaks. The study established that the strategy sustained group ranches because not all livestock was lost during droughts and other environmentally related calamities. Therefore maximization of stock numbers was geared towards livestock survival and reduced risks.

To counter the effects of shocks related to the physical environment, group ranches in Samburu County reserved rich-patch vegetation and/or established feed reserves during the wet seasons. The strategy involved setting aside grazing areas within their group ranches to allow regeneration of grass and vegetation. The grazing reserves acted like a "pasture bank" whose "account" was operated during droughts or dry seasons. Equally, the strategy sustained group ranches for it reduced livestock losses and assured members that ranching would be sustained.

The study established that stock mobility, herd maximization, diversification of species, dispersion of animals and reserving rich-patch succeeded in holding group ranches together. For instance, livestock migration strategy was widely adopted by ranchers in Samburu County during the severe droughts of 1980, 1984 and 2000. The strategy reduced livestock mortality rate and held group ranches together because there was a reduction in livestock loss thus sustaining ranching activity.

Finally, the study established that rainfall in the study area was unreliable and unpredictable, and droughts were experienced almost every five years (Lesogorol,

2008). The study findings concurred with Ekiyar et al. (2012) who observed that environmental characteristics were the most important factors that influenced the choice of agricultural activities applied by agriculturalists in the rangelands such as Samburu County. It was noted that group ranches in Samburu County were highly vulnerable to climatic change for they mostly relied on rain-fed agriculture. Therefore, the study observed that environmental characteristics determined choice of sustainability strategies adopted by group ranches in Samburu County.

5.1.2 Organizational Determinants of Choice of Sustainability Strategies.

The study sought to assess organizational characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County through investigation of the influence of organizational structures, past strategies and past experiences. The study established that there was a positive relationship between organizational characteristics and the choice of sustainability strategies adopted by group ranches in the study area. It was established that organizational structures were important organizational characteristics determining the choice of sustainability strategies as they spelt out what people should do, how and when. The structures also indicate who makes decisions and what provisions of the law are followed before decisions are executed. This observation concurred with Wambugu (2006) who observed that organizational structures are duties and responsibilities, power distribution and decision making in organizations. Organizations make and adopt choices to improve performance through organizational structures and by people charged with the necessary responsibility to make decisions.

The study established that group ranches in Samburu County were properly structured and roles played by various players were clearly defined. Most of the members knew their roles in the management of their collectively held land. Likewise, the group ranch officials knew their roles in the day-to-day administration and management of group ranches. They were the legal representatives of the group ranches with power to sue and be sued on their own behalf and that of the ranches while the members were the shareholders with the final say on the administration and management of their resources. The officials would propose strategies and table them before the members for concurrence and approval before adoption during Annual General Meeting (AGMs). It was during these AGMs when members were taken through the proposals regarding sustainability strategies by the officials to choose the strategies that, according to them were viable. The attendance and participation of members at the AGMs was crucial as it gave them the right to information regarding the activities of their group ranches and gave them the opportunity to vote on important matters affecting them. For instance, it was during such meetings when members were taken through the financial reports, among other reports. Matters to do with the distribution of dividends accrued from income generating projects and any proposed projects that the group ranches wished to undertake, were discussed in such meetings.

This kind of arrangement held group ranches together because it was transparent, accountable and participatory; no members felt side-lined in decision-making. Every member had a right to enjoy the benefits accruing from the group ranch resources. However, it was established that group ranches in the study area such as Marti and Ngilai rarely convened Annual General Meetings as required by law.

The study found out that most of the group ranches in Samburu County were managed by honest officials, a characteristic that lacked among the officials of group ranches in other Counties like Narok and Kajiado. For instance, Maji Moto group ranch in Narok South Sub-County disintegrated, not because it did not have a clear and flexible structure, but because the officials were not accountable and transparent as they allocated more land to themselves and their cronies. The officials also failed to convene AGMs as the law required. This aggrieved the members and they dissolved the group ranch (Ministry of Lands and Physical Planning, 2016).

Similarly, the study revealed that past strategies such as the construction of rock catchment, shallow wells, pans and earth dams were adopted during droughts. At the same period, drugs were also bought to treat livestock whenever diseases occurred; the strategy reduced livestock losses. Other past strategies that sustained group ranches in the county included buying of hay for livestock, holding of consultative/planning meetings on regular basis and replacing corrupt and incompetent group ranch officials. For instance, Girgir group ranch delivered water, in tanks, to its members for both human and livestock use during the 2008-2009 droughts. The ranch also constructed water pans and shallow wells. Livestock was vaccinated, dewormed and also provided with other clinical treatments. This strategy contributed toward sustaining Girgir group ranch for it minimized livestock losses.

These organizational determinants of the choice of sustainability strategies adopted by group ranches in the County were related to management determinants in that it was the management that advised the members to adopt the strategies which had previously led to the sustainability of group ranches. The findings concurred with those of Juliusson et al. (2005) who observed that past strategies determined the

choice of strategies adopted by organizations as they embraced strategies which had previous positive results.

The study also found out that the past experiences determined the choice of sustainability strategies adopted by group ranches in Samburu County. It was established that group ranches in the County experienced frequent and recurring droughts that led to inadequate water and pasture, endemic livestock diseases and low investments. As a result of these past experiences, group ranches adopted eco-tourism and conservation strategies to counter the effects of variability of rainfall patterns, droughts, extreme temperatures and diseases, for sustainability. For instance, Kalama and Namunyak wildlife conservancies were established for the effective protection of water catchment areas, re-generation of vegetation and efficient management group ranch resources.

5.1.3 Societal Determinants of Choice of Sustainability Strategies.

The study sought to identify societal characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County. It investigated the relationship between culture, level of education and lifestyles of group ranch members, and choice of sustainability strategies adopted by group ranches in Samburu County. The study established that there existed a positive relationship between societal characteristics and choice of sustainability strategies adopted by group ranches in the study area.

The study established that culture was used by the Samburu Community to communicate their beliefs, customs and values. It played an important role in the social set up in fostering feelings of group solidarity and identity. The study

established that ranching played a key role in the group ranch members' livelihoods as it improved their standards of living. Besides being a source of income, livestock was considered a common means of demonstrating wealth and gave a social status to its owners. Among the Samburu Community, livestock had certain cultural uses; it was used in ceremonies and festivities. For instance, whereas cows were used for the payment of bride wealth by prospective husbands to the prospective wives' families, goats were slaughtered when babies were born into the family. This was important as it signified introduction of the new born to the ancestors so that the baby could be blessed and fully accepted into the community. Meat-eating and milk-drinking cultural habits among ranchers in the study area made them stick to ranching as it was the main source of the products.

The findings were consistent with those of Bettencourt et al (2013) that revealed that livestock was slaughtered during funerals, rituals, and used to pay bride prices. Therefore, culture played a significant role in determining the choice of sustainability strategies adopted by group ranches in Samburu County for livestock was highly valued by the members of group ranches as it symbolized wealth and prestige.

During Focus Group Discussions, ranching was viewed as a lifestyle that the ranchers could not do without. It was an integral part of their lives, and many considered it their primary occupation. The study observed that there was livestock in almost every homestead and every homestead struggled to sustain ranching. The study established that there was a lifestyle of dependency on livestock as it acted like a safety net whenever there was a desperate need for cash. This dependency boosted the need to sustain ranching as an activity and made group ranches in the study area choose and

adopt strategies that were in conformity with cultural values and lifestyles of the members.

The study also investigated the influence of the level of education of the members of group ranches on the choice of sustainability strategies adopted by group ranches in the study area. The study found that a majority of the members had formal education and understood the procedures and policies of the group ranch system. Furthermore, they participated fully in the decision making processes of group ranches because they had the basic level of education. They knew the strategies that would sustain the ranches and the ones that could not. These findings are consistent with the finding of Worku (2011) who found that education is the leading sector for rapid development of any society. Similarly, it was established that group ranches such as Girgir, Ngilai, Marti and Losesia used revenue accrued from ecotourism and other investments to offer school bursaries to the needy children of the members. This strategy enabled the students to clear fee balances and sustained group ranches since the members never sold much of their livestock to pay school fees. Therefore, the desire to educate their children made members stick to ranching as an occupation, leading to sustainability of group ranches. Overall, the collective benefits accruing to the group ranches were shared equally by all the members.

5.1.4 Management Determinants of Choice of Sustainability Strategies.

The study sought to establish management characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County. It investigated the influence of the level of education, the tenure of office and the experience of the group ranch representatives(members elected to manage the ranches) on the choice of sustainability strategies adopted by group ranches in the County.

The study established that there was a strong positive relationship between the level of education, the tenure of office and the experience of the management on one hand, and the choice of sustainability strategies adopted by the group ranches in the study area on the other hand. The study looked at the attributes associated with the management (the group ranch representatives).

The study established that the level of education among the group officials positively influenced the choice of sustainability strategies adopted by group ranches in the study area. For instance, all ten group ranch officials for Losesia group ranch had attained the secondary level of education and this increased their capacity to absorb new ideas that led to the sustainability of their group ranch. The findings were in conformity with those of Ahn, Minshall and Mortara (2014) that established that highly educated Chief Executives of organizations could significantly influence the strategic decisions of those organizations. The study noted that there was a strong relationship between the level of education of decision makers and the strategic decision-making process that resulted into the sustainability of organizations such as group ranches.

The study established, therefore, that the extent to which group ranches achieved their goals was a function of the level of education of management (group ranch officials). The findings were consistent with those of Ahn et al. (2014) who noted that organizations should hire and deploy workers in various positions based on the educational qualifications required by the job. The study established that most of the group ranches that disintegrated/dissolved in Kenya were managed by people with low levels of education as most of them elected semi-literate officials on the basis of their social status but not on their management skills. For instance, those with a lot of

livestock but a low level of education were elected as group ranch representatives in Kajiado and Narok Counties. However, this was not the case with group ranches in Samburu County. To qualify to be elected a group ranch official one must have attained at least secondary level of education. This made group ranches sustainable because officials would come up with appropriate sustainability strategies.

The study established that most of group ranch officials in the County had served ranches for several years as there was the tenure of office. This gave the officials time to understand the operations of the ranches and the external environment in which the ranches operated. Out of experience, the officials were able to advice on the strategies that would sustain the ranches. Although elections were held every year, officials who worked hard were occasionally re-elected. This arrangement sustained group ranches because it increased the officials' tenure and made them more committed to implementing sustainability strategies of the group ranches. The findings were consistent with those of Umukoro (2009) which noted that long tenured management attained a better and deeper understanding of the organization's environment, the accumulated track record of acquired job skills.

The study established that due to management variables (the level of education, the tenure of office and the experience of management), the following sustainability strategies were chosen: conservation strategy; leasing of unutilized land strategy; establishment of local governance system strategy; and formation of strategic alliances by group ranches in Samburu County.

The conservation strategy involved the establishment of conservancies. For instance, Sarara, Losesia, Girgir, Ngotuk Ongiron group ranches established the following conservancies: Namunyak Conservancy (Sarara group ranch); Kalama community

conservancy (Girgir group ranch); Sera community conservancy (Losesia group ranch); and West gate conservancy (Ngotuk Ongiron Group ranch). The strategy led to the protection of the water catchment areas, wildlife, and vegetation and enabled holistic management of resources resulting in alternative livelihoods. Moreover, it created jobs for members and held group ranches together due to the diversification of activities such as ecotourism. Some group ranches like Ngutuk Ongiron, Losesia and Seriolipi were engaged in ecotourism in Namunyak and sera conservancies as shown in appendices.

Similarly, the study established that group ranches leased land that they did not fully utilize. This strategy was a management decision and entailed contractual agreements between the group ranch officials and the lessees. The lessees obtained the rights to use the land for regular payments to the group ranches (lessors). For instance, Ngotuk Ongiron ranch in Samburu County leased part of its land to Tamimi Limited on which it (Tamimi Limited) had put up a Sasaab Tourist Lodge; Girgir group ranch leased land to Safaricom, Air Kenya and Safarilink companies; Losesia group ranch leased part of its land to the Kenya Defence Forces (KDF) and Kamanga Holdings. Monies accruing from the leases were used to pay school fees for students, build dispensaries and assisted the members to restock their livestock. The strategy held group ranches together because the benefits accruing from the leases were shared transparently and equally.

However, the strategy to lease unutilized land did not hold group ranches in other parts of Kenya together because instead of sharing the benefits accruing from the lease of unutilized land equally to the members, the proceedings were pocketed by the group ranch representatives. For instance, the study established that Maji Moto group

ranch in Narok County, Kenya, leased land to Olarro lodge in 1997 for 45 years but revenues accruing from the lease were misappropriated by the group ranch officials (MoLPP, 2016). This lack of accountability and transparency led to the disintegration of Maji Moto group ranch and protracted legal battles at the High Court of Kenya in Nakuru and Narok.

Similarly, the study established that in other parts of Kenya, some group ranch officials leased land without the consent of the members. For example, it was reported that officials of Imbirikani ranch in Kajiado County had leased 2,000 acres of land to a gemstones dealer without the knowledge and consent of the members of Imbirikani group ranch.

The study further established that rents collected by Rombo ranch officials in Kajiado County from telecoms companies for masts did not reach the members. This led to the disintegration of the ranch. The situation was replicated in Kuku A and Kuku B, Olgulului, Eselenkei, Imbirikani and Kimana group ranches in Kajiado County, which have since been subdivided. This strategy was chosen by group ranches in Samburu County for they wanted the unutilized land to be utilized and get revenue from the leases. The strategy worked because the officials were honest and accountable. The dishonest officials were voted out according to the constitution of group ranches.

Another strategy determined by management characteristics, which held the group ranches in Samburu County together, was the choice of a local governance system. The study established that a majority of group ranches in the study area had established local governance systems that crafted rules regarding administration and management of ranch resources, registration of members and disbursement of funds to various group projects. Apart from the Annual General Meetings held to pass

resolutions regarding strategies to be adopted, there were other meetings held by various sub-committees to evaluate the sustainability of the chosen strategies. Similarly, there were sub-committees responsible for the implementation of ranch projects that would meet monthly. The Sub-committees met to discuss matters affecting the projects and would suggest additional strategies to be ratified for adoption at the Annual General Meetings. .

Due to the influence of management characteristics two or more group ranches in Samburu County formed strategic alliances to share resources and undertake specific projects for mutual benefits. The strategy aimed at benefiting all the members of the collaborating group ranches in the short-term, long-term or both and each group ranch maintained its autonomy. For instance, it was established that Losesia and Seriolipi group ranches entered into an agreement to establish Sera wildlife conservancy to reduce poaching, increase wildlife numbers and diversify species. Approximately 51,740 hectares were set apart for conservation and 10,700 hectares were fenced for a Rhino sanctuary. As a result, members benefited from improved income from tourism, peaceful co-existence between communities within Sera Conservancy and increased income from livestock sales. This strategy held the two group ranches together because the livelihoods were diversified as members got jobs through conservancy, NGOs and at the British Army camps within the conservancy.

The study established that management characteristics greatly influenced the formation of strategic alliances compared with other factors because managing alliances required experienced group ranch officials with a deep understanding of the strategic purpose of their group ranches. Although most of the agreements were informal, a few were formal and required educated group ranch officials to enter into

them. The findings concurred with the previous studies that observed that since the business world was both competitive and agile, it required competent and experienced management (Gomez-Mejia & Balkin, 2002).

The study established that some organizations, such as group ranches, failed because they were unable to change and adapt to competitive environments. A change in the management was also an important mechanism for management challenges. However, the study established that the longer the management remained in office, the more they were insulated over time, and they were less likely to deviate from earlier course of action, especially when change involved organizational strategy. Most of the group ranches failed because the officials resisted change and failed to convene AGMs for fear of being replaced as officials.

5.2 Summary of Findings

The purpose of the study was to identify, analyze and document determinants of the choice of sustainability strategies adopted by the group ranches in Samburu County, Kenya. Ranching is a livestock production system practiced mostly in the rangelands of the world where rainfed agricultural activities are limited due to challenges of climatic variability. The concept of group ranches refers to a group of people (members) jointly holding title to land and owning livestock individually but herding them together.

The study area was Samburu County, one of the 47 Counties in Kenya. The County is located within the rangelands of Kenya in the north part of the Great Rift Valley, about 300km north of Nairobi. The County was chosen as a study area because of the

following two reasons: First, the area is one of the rangelands where livestock production is more pronounced than crop production. Ranching is the dominant land use, characterized by seasonal migrations of ranchers and their animals in search of water and pasture. Secondly, the County had established group ranches that adopted various sustainability strategies to mitigate environmental challenges. However, there was little empirical information on how the group ranches in the study area crafted the adopted sustainability strategies. Since the land adjudication process was on-going in the study area, the establishment of more group ranches was expected. Hence the need to identify the best practices of the group ranches in the study area by identifying, analysing and documenting determinants of the choice of sustainability strategies. The same sustainability strategies could be adopted by group ranches established in other areas outside Samburu County.

The objectives of the study were as follows:

- 1). Establish environmental characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya;
- 2). Assess organizational characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya;
- 3). Identify societal characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya; and
- 4). to find out management characteristics determining the choice of sustainability strategies adopted by group ranches in Samburu County, Kenya.

The basic data used in this study were collected using Questionnaires, Focus Group Discussions, Key Informant Interviews, Direct Field Observation and Secondary data. Different methods were employed to analyze determinants of choice of sustainability strategies adopted by group ranches and varied from simple descriptive statistics to multiple linear regression models. The study utilized cross tabulations to compare study variables. Information collected through Direct Field Observation, Focus Group Discussions, Interview schedules as well as from FGDs was summarized in terms of major themes, opinions, similarities and differences.

A total of 374 questionnaires were distributed to the targeted 374 respondents out of which 350 questionnaires were returned giving a response rate of 93.6 per cent. The study targeted only members of group ranches who included group ranches officials. The group ranch officials were also members of the respective group ranches elected to manage group ranches.

Majority of the respondents were males and formed the majority of group ranch membership. They were all above 18 years old and became members by birth or inheritance. The Registrar of Group Representatives kept registers of members of the group ranches in Kenya, copies of which were kept by the Assistant Registrars of Group Representatives and the Group Ranch Officials in the respective Counties. All the registers tallied with the ones kept by the Registrar of Group Representatives at the Ministry of Lands and Physical Planning Headquarters, Nairobi. Updating of the registers, that is the addition of new members, had to be approved by the members during the Annual General Meetings.

The study identified, analyzed and documented environmental, organizational, societal and Management determinants of choice of sustainability strategies adopted by group ranches in Samburu County. The environmental characteristics that were identified analyzed and documented were rainfall patterns, floods and diseases. Organizational characteristics included organizational structures, past experiences and past strategies. The identified societal characteristics were culture, the level of education and the lifestyles. Finally, the study established management characteristics that included the level of education of the management, the tenure of office, the experience in leadership and the change in management.

The study also established that policy requirements and politics influenced the extent of influence caused by environmental, organizational, management and societal characteristics had on the choice of sustainability strategies adopted by group ranches in Samburu County. It was established that environmental, organizational, societal and management factors determined choice of sustainability strategy adopted by group ranches. Therefore, they were to be incorporated when formulating policies affecting the group ranches in Kenya.

5.3 Conclusions

The study aimed at establishing determinants of choice of sustainability strategies adopted by group ranches in Samburu County, Kenya. From the analysis of data and hypothesis testing, it was observed that environmental, organizational, management and societal characteristics determined the choice of sustainability strategies adopted by group ranches in Samburu County.

5.3.1. Environmental Determinants of Choice of Sustainability Strategies.

The study observed that variability of rainfall patterns, high temperatures, droughts, floods and diseases positively influenced choice of sustainability strategies adopted by group ranches in Samburu County. The study observed that access to pasture and water was essential for the sustainability of group ranches in Samburu County.

Therefore, the study concludes that the stock mobility strategy, the livestock diversification strategy, the herd dispersion strategy, the herd maximization strategy and the conservation strategy sustained group ranches as they minimized losses resulting from the effects of environmental characteristics. These strategies were the most suitable pathways toward the sustainability of group ranches in the arid and semi-arid lands of Kenya.

5.3.2 Organizational Determinants of Choice of Sustainability Strategies.

The study established that organizational characteristics determined the choice of sustainability strategies adopted by the group ranches in Samburu County, Kenya. It was established that the past experiences, the past strategies and the organizational structures positively influenced the choice of sustainability strategies adopted by group ranches in the study area.

Due to flexible organizational structures, past experiences and past strategies, the group ranches crafted sustainable strategies such as replacement of corrupt officials, purchase of hay, construction of dams and shallow wells, eco-tourism and conservation strategies. The study concludes that organizational structures displayed by the group ranches in the study area were appropriate since they clearly spelt out the roles of the members and those of the officials. The clear roles facilitated the adoption

of the sustainability strategies chosen by the group ranches. Major decisions were made during the Annual General Meetings attended by two thirds of the total membership.

5.3.3 Societal Determinants of Choice of Sustainability Strategies

The study established that societal characteristics determined the choice of sustainability strategies adopted by group ranches in Samburu County. It established that culture, the level of education and the lifestyles determined the choice of sustainability strategies adopted by group ranches in the study area.

Culture was used as a means of communicating values, beliefs and customs while lifestyle dependency on livestock was used as a safety net, in times of need when the members required cash. The study concludes that culture and lifestyles were considered when choosing strategies for adoption. Only those strategies that were favourable to the culture and lifestyles of the ranchers were chosen and adopted.

5.3.4 Management Determinants of Choice of Sustainability Strategies.

The study further established that management characteristics determined the choice of sustainability strategies adopted by group ranches in Samburu County. It was established that the level of education, the tenure of office and the experience of the management determined the choice of sustainability strategies adopted by group ranches in the study area.

Due to the influence of management characteristics, the group ranches chose the sustainability strategies like conservation strategy, leasing of unutilized land strategy, establishment of local governance system and the formation of strategic alliances. The

study concludes that the level of education, the experience and the tenure of office of those in the management have a great role in the determination of the sustainability strategies chosen and adopted by group ranches.

Overall, it was found out that although organizational, societal and management characteristics determined the choice of sustainability strategies adopted by the group ranches in the Samburu County, it was the environmental characteristics that had the greatest influence.

5.4 Recommendations

- a) The findings of the study revealed that environmental characteristics, organizational characteristics, management characteristics and societal characteristics determined the choice of sustainability strategies adopted by the group ranches in Samburu County. Therefore, in order to sustain the group ranches as livestock production systems, the study recommends consideration and integration of environmental, organizational, societal and management factors when formulating policies affecting group ranches.
- b) The study established that environmental characteristics such as the variability of rainfall patterns, high temperatures, droughts and diseases determined the choice of sustainability strategies adopted by group ranches. The study recommends for mapping and marking of the livestock migration corridors particularly the ones across counties. This will minimize conflicts arising from grazing by various herders. Livestock holding grounds to be established along the migration corridor to control livestock diseases. More research on drought resistant livestock species to be conducted.

- c) The study found that organizational characteristics such as the organizational structures, the past experiences and the past strategies determined the choice of sustainability strategies adopted by group ranches in Samburu County. The study recommends that group ranches should have clear and flexible organizational structures, with local governance systems in order to operate efficiently and effectively to achieve their desired goals. The study recommends the establishment of committees comprising of members to manage the group ranches. There should be established supreme authority within a group ranch charged with the responsibility of managing the group ranch. The committee should comprise of about twenty people who must have attained secondary level of education.
- d) The study established that societal characteristics determined choice of sustainability strategies adopted by group ranches in Samburu County. It recommends that culture and the lifestyles of the members of group ranches should be considered wherever decisions touching on the sustainability of group ranches are being made. The study established that the Samburu culture was gender biased against women in respect to land ownership. Majority of the respondents were males and formed the majority of group ranch membership in Samburu County while that of women was a minority. This was attributed to the cultural beliefs of the Samburu community that land could only be inherited and owned by men. Since women are crucial users of resources and constitute the larger population, their access to, use of and control over land based resources are essential in ensuring the sustainability of group ranches in the County. They should be allowed to be members and to actively participate in passing resolutions touching on the choice of

sustainability strategies adopted by group ranches in the study area. The membership should be opened to all the adults in the respective group ranches.

- e) For sustainable management of group ranches, the study recommends that the group ranches elect people with a secondary level of education and experience, whose tenure of office is assured. However, they should not stay in office for more than six years. Management of group should be like that of business enterprises where teams are formed from within and /or experts are hired from without to always scan the environment and come up with better strategies that can sustain them.
- f) The study established that the group system is the best land ownership and livestock production strategy in the rangelands and recommends that a law be passed to discourage group ranches from dissolving due to the fragile nature of environments in which they are established.
- g) Finally, it is recommended that policy on the administration and management of group ranches be reviewed to allow individual land ownership within a group ranch. Where members shall have individual titles to their land but still retain their membership in the group ranch with grazing rights for grazing. This will take care of the members who want to permanently develop their plots.

5.5 Suggestions for Further Research

1. The study established that there were challenges in the implementing sustainability strategies chosen by group ranches in the study area. For instance, there was a challenge in implementing the conservation strategy in some group ranches; the conservances were occasionally invaded by herders

seeking water and pasture. During FDGs it was reported that there grazing related conflicts between Samburu and Turkana communities in the Northern part of Samburu County, and when the Samburu and Somalia pastoralists from the north invaded the conservancies in Samburu East. Despite the presence of armed group ranch rangers in the study area, armed conflict between communities living in Samburu County and the neighbouring Counties of Laikipia, Isiolo and Baringo were common during droughts. The study, therefore, recommends further research on the sustainability of group ranches specifically the challenges affecting implementation of sustainability strategies of group ranches in Samburu County.

2. The study established that some group members, especially those living in Malaso, Porro, Mbaringoni and Losuk and the areas surrounding urban centres like Maralal in Samburu West Sub-County, were ditching the communal way of life and adopting a more individually focused one by adopting crop farming. This coupled with the revelation that majority of the group ranch members had a monthly income of twenty thousand shillings and below, calls for a research on the impact of group ranching in Samburu County on the livelihood security of the members.
3. This study focused on the choice of sustainability strategies adopted by group ranches in Samburu County. Its findings, therefore, might not be generalized to cover other types of ranches such as co-operative and private ranches that have different management practices and land tenure systems. Therefore, there

is need to carry out a study on the determinants of choice of sustainability strategies adopted by co-operative and private ranches in Samburu County.

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8. What is your income per month? Below 20,000 ksh 20,000-40,000 ksh
41,000-60,000 ksh Over 60,000 ksh

9. How did you become a member of your group ranch?

Birth Marriage Bought Inheritance

SECTION B: MAIN GROUP RANCH ACTIVITIES

10. Currently which activities are being undertaken by your group ranch ?

Ranching

Ranching and Eco-tourism

Ecotourism and Mining

Ranching , Eco-tourism and Mining

Quarry harvesting

Sand harvesting

Eco-tourism and sand harvesting

Other(specify).....

SECTION C: ENVIRONMENTAL CHARACTERISTICS

11. What environmental characteristics influence the choice of sustainability strategies adopted by your group ranch?

Rainfall patterns

- Temperatures
- Droughts
- Diseases
- Floods
- Rainfall patterns and Temperatures
- Rainfall patterns , Temperatures and Droughts
- Ranfall patterns, Temperatures, Droughts and Diseases
- Rainfall patterns, Temperatures, Droughts, Diseases and Floods
- Other (specify).....

12. To what extent has each of the following environmental characteristics influenced the choice of sustainability strategies adopted by your group ranch? Use: 1-Not at all; 2-Low extent; 3-Moderate extent; 4-Great extent; and 5 – Very great extent.

Environmental Characterisrics	1	2	3	4	5
Rainfall patterns					
Temperatures					
Droughts					
Floods					
Diseases					

Other(specify).....					
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SECTION D:ORGANIZATIONAL CHARACTERISTICS

13.What organizational characteristics influence choice of sustainability strategies of your group ranch?

- Organizational structure
- Past strategies
- Past experience
- Organizational structure, Past strategies and Past experience
- Other(specify).....

14. To what extent has each of the following organizational characteristics influenced the choice of sustainability strategies adopted by your group ranch? Use: 1-Not at all, 2-Small extent, 3-Moderate extent, 4-Great extent and 5-Very great extent.

Organizational Characteristics	1	2	3	4	5
Organizational structure					
Past strategies					
Past experiences					

Other(specify).....					
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SECTION E: SOCIETAL CHARACTERISTICS

15. What societal characteristics influence choice of sustainability strategies of your group ranch?

- Culture
- Education
- Lifestyles
- Other (specify).....

16. To what extent has each of the following societal characteristics influenced the choice of sustainability strategies adopted by your Group Ranch? Use 1-Not at all, 2-Small extent, 3-Moderate extent, 4-Great extent and 5-Very great extent.

Societal characteristics	1	2	3	4	5
Culture					
Education					
Lifestyles					
Other (specify).....					

SECTION F:MANAGEMENT CHARACTERISTICS

17.What management characteristics influence the choice of sustainability strategies adopted by your group ranch?

- Education
- Tenure of office
- Experience
- Change in management(Succession)
- Leadership skills and competences
- Others (specify).....

18. To what extent has each of the following management characteristics influenced the choice of sustainability strategies adopted by your Group Ranch? Use: 1-Not at all, 2-Small extent, 3-Moderate extent, 4-Great extent and 5-Very great extent.

Management characteristics	1	2	3	4	5
Education					

Tenure of office					
Experience					
Change in management (succession)					
Other(specify).....					

SECTION G: MODERATING CHARACTERISTICS

19. How has the present policy requirement regarding incorporation of group ranches influenced the choice of sustainability strategies adopted by your group ranch?

Positively Negatively Neutral (neither positively nor negatively

No effect at all

20. What do you think requires change or improvement on the policy requirements?

.....

21. How has politics influenced the choice of sustainability strategies adopted by your group ranch?

Positively Negatively Neutral (neither positively nor negatively

No effect at all

22. To what extent has each of the following moderating characteristics influenced the choice of sustainability strategies adopted by your group ranch? Use 1-Not at all, 2-Small extent, 3-Moderate extent, 4-Great extent and 5-Very great extent.

Moderating characteristics	1	2	3	4	5
Policy requirements					
Politics					
Other (specify).....					

SECTION H: INTERVENING CHARACTERISTICS

23 Which resources does your group ranch have?

- Livestock Wildlife Forests Sand
 Minerals Employees Water Pasture
 Solar energy Wind energy Land

Other (specify).....

24 To what extent has each of the following intervening characteristics influenced the choice of sustainability strategies adopted by your Group Ranch? Use 1-Not at all, 2-Small extent, 3-Moderate extent, 4-Great extent and 5-Very great extent.

Intervening characteristics	1	2	3	4	5
Livestock					
Wildlife					
Minerals					
Employees					
Forests					

Sand					
Solar energy					
Wind energy					
Land					
Other (specify).....					

SECTION I: CHOICE OF SUSTAINABILITY STRATEGIES

25. Which sustainability strategies has your group ranch adopted due to the influence of environmental, societal, organizational and management characteristics?

Conservation strategy

Stock mobility strategy

Local governance strategy

Strategic alliances

Other (specify).....

26. Which of the following characteristics has the greatest influence on the choice of sustainability strategies of your group ranch?

Environmental characteristics

Organizational characteristics

Societal characteristics

Management characteristics

Thank You

Appendix II: Guidelines for Focus Group Discussions (FGDs)

Date of Interview.....Name of Moderator

Venue of Interview.....Name of Recorder.....

	Name of participant	Sex
1.		
2.		
3.		
4.		
5.		
6.		

1. How have you been involved in the management of your group ranch?
2. What positive experiences had you with your group ranch?
3. What contributed to that positive experience?
4. What adverse experience had you with your group ranch?
5. What caused that negative experience?
6. What did your management put in place to counter the adverse experiences?
7. Who chooses what the group does?
8. What influences the choice made by your group ranches?
9. What sustainability strategies does your group ranch have?
10. What influences the choices of sustainability strategies adopted by your group ranch?
11. What environment, organizational, management and societal factors influence the choice of sustainability strategies adopted of your group ranch?
12. What factor has the most influence on the choice of sustainability strategies?

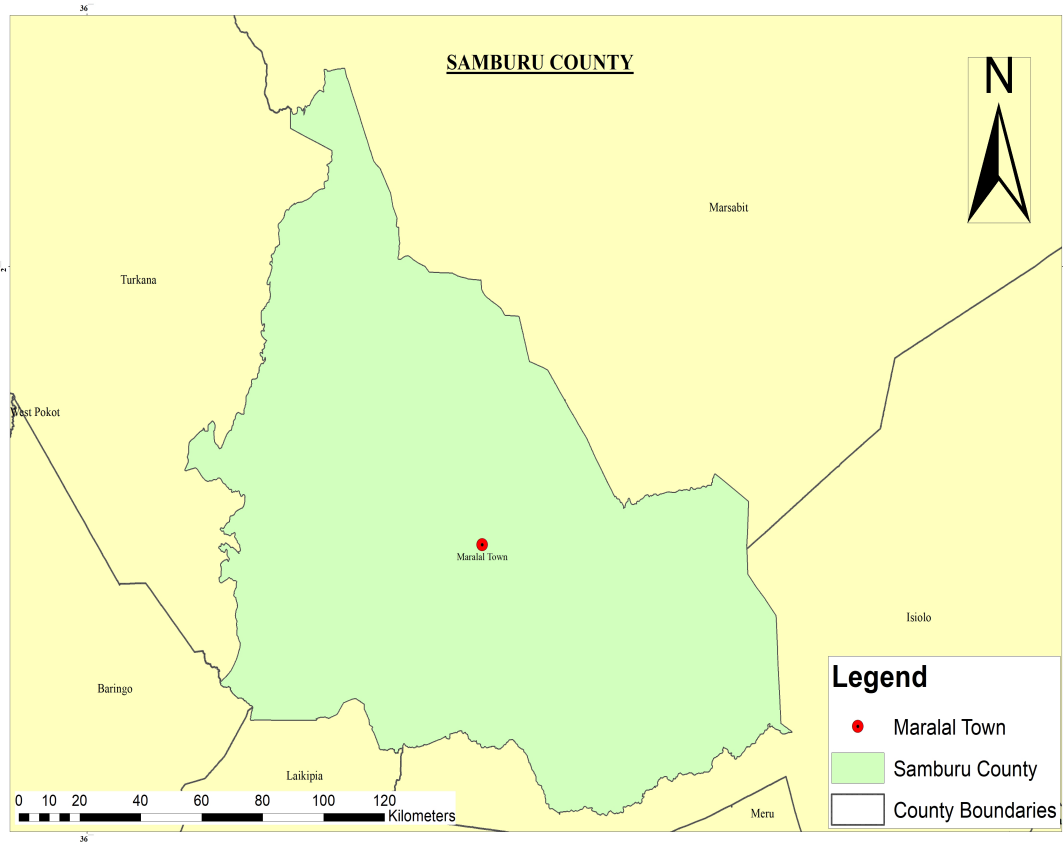
Appendix III: Interview Schedule for Key Informants

Date of Interview..... Name of Interviewer.....

Venue of Interview Name of Key Informant (optional).....

1. Which activities are the group ranches in your county undertaking?
2. What challenges are they facing as they undertake their activities?
3. How do the group ranches overcome the challenges?
4. Which strategies have the group ranches adopted to overcome the challenges?
5. Do the group ranches have constitutions that guide their management?
6. Do the group ranches have strategic plans?
7. How do the group ranches make decisions on what strategies to adopt?
8. What factors influence the decision making of the group ranches on choices they make?
9. Have the strategies adopted by group ranches led to their holding together?
10. In your opinion, what factors determine the choice of strategies adopted by group ranches in your County?
11. Do environmental, organizational, management and societal characteristics have any influence on the choice of strategies the group ranches make?
12. What influence does policy requirement and politics have on the choice of strategies adopted by group ranches in Samburu County?
13. In your opinion, what strategies can the group ranches adopt for sustainability?

Appendix IV: Map of Samburu County.



Appendix V: Tourist Attraction Site in Namunyak Wildlife Conservancy



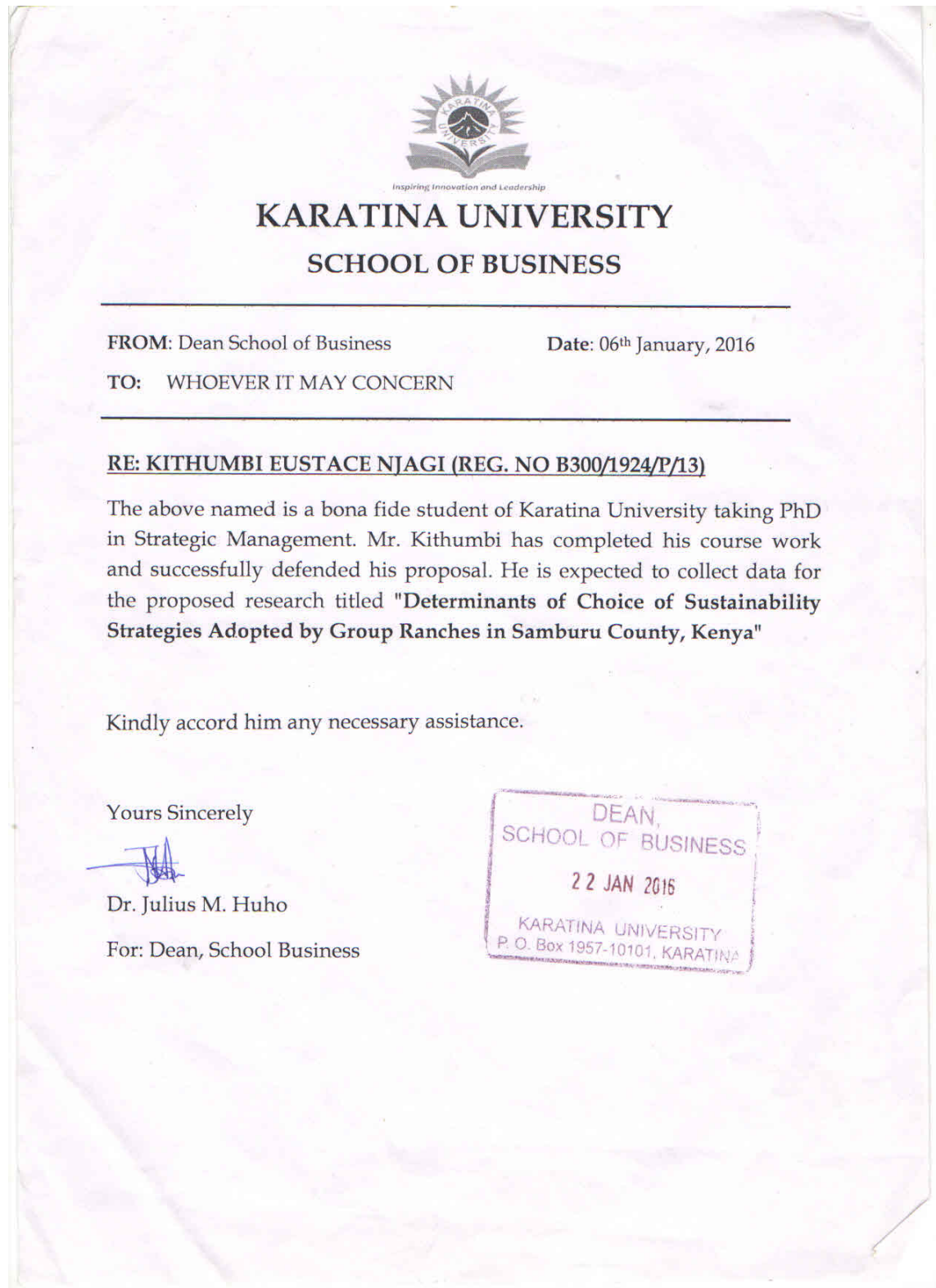
Appendix VI: Sera Conservancy in Samburu County



Appendix VII: Planning Meeting of Losesia Group Ranch



Appendix VIII: Clearance Letter from the School of Business, Karatina University



Appendix V: Research Permit/authorization letter from NASCOTI



**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

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Ref: No. **NACOSTI/P/16/54179/9348**

Date:
29th January, 2016

Eustace Njagi Kithumbu
Karatina University
P.O. Box 1957-10101
KARATINA.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Determinants of choice of sustainability strategies of adopted by group ranches in Samburu County, Kenya,*" I am pleased to inform you that you have been authorized to undertake research in **Samburu County** for a period ending **27th January, 2017.**

You are advised to report to **the County Commissioner and the County Director of Education, Samburu County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. S. K. LANGAT, OGW
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Samburu County.

The County Director of Education
Samburu County.

National Commission for Science, Technology and Innovation is ISO 9001:2008 Certified

APPENDIX VI: LIST OF PUBLICATIONS

Kithumbu, E.N., Huho, J.M., & Omondi, H.R. (2017). Environmental Determinants of Choice of Sustainability Strategies Adopted by Group Ranches in Samburu County, Kenya. *International Journal of Research in Business and Social Science*, 6(3), 24-34. <http://dx.doi.org/10.20525/ijrbs.v6i3.758>

Kithumbu, E.N., Huho, J.M., & Omondi, H.R. (2017). Organizational Determinants of Choice of Sustainability Strategies Adopted by Group Ranches in Samburu County, Kenya. *International Journal of Research in Business and Social Science*, 6(3), 34-47. <http://dx.doi.org/10.20525/ijrbs.v6i4.757>