ENVIRONMENTAL FACTORS AND SUSTAINABILITY OF PASTORAL FIELD SCHOOLS PROJECTS' INCOME GENERATING ACTIVITIES IN ARID AND SEMI ARID COUNTIES IN KENYA: A CASE OF KAMAR PASTORAL FIELD SCHOOL IN MOGOTIO SUB COUNTY.

LUI CHERUIYOT KIRUI

A Research Project Submitted in Partial Fulfilment Of The Requirements For The Award Of The Degree Of Master Of Arts In Monitoring And Evaluation, School Of Business Of Africa Nazarene University

June 2024

DECLARATION

STUDENT'S DECLARATION

I declare that this thesis is my original work and that it has not been presented in any other university for academic credit.

Signature: Date: 18/06/2024



Name: Lui Cheruiyot Kirui Registration Number: 21J01DMME015

SUPERVISOR'S DECLARATION

This research was conducted under our supervision and submitted with my approval as the university supervisors.

1st Supervisor

Name: Dr. Naomi Njoroge

Dr. Naomi Njoroge

Signature: **Dr. Naomi Njoroge (PhD)** Date: 18/06/2024

2nd Supervisor

Name: Dr. Wanjiru Nderitu (PhD)



Signature: Date: 18/06/2024

DEDICATION

I dedicate this research project to my beloved family, whose unwavering love, support, and understanding have been the cornerstone of my academic journey. Their encouragement, sacrifices, and belief in my aspirations have provided me with the strength and motivation to pursue this endeavor with determination and resilience. Their unconditional love and guidance have shaped my values, instilled in me a passion for learning, and nurtured my intellectual curiosity, their presence has brought joy, laughter, and perspective to my life. I thank them for their patience, understanding, and unwavering support. Their encouragement and belief in my abilities have fueled my determination to excel and have given purpose to my endeavors. Finally, their steadfast love, encouragement, and understanding have been my greatest source of strength and inspiration. I thank them for standing by my side, believing in my dreams, and sharing in the challenges and triumphs of this journey.

This research project reflects our collective values, aspirations, and dreams. May it serve as a tribute to the love, support, and sacrifices of my family, and may its findings contribute to a brighter and more sustainable future for generations to come.

ACKNOWLEDGEMENT

I would like to express my gratitude to my academic advisors, Dr. Naomi Njoroge and Dr. Wanjiru Nderitu for their guidance, encouragement, time, and support throughout this research project proposal development. Their constructive feedback has helped me refine my research project proposal. Their suggestions and comments have significantly improved the quality of my research project proposal. Their invaluable guidance, unwavering encouragement, dedicated time, and unwavering support have been instrumental throughout the development of this research project. Their profound expertise, insightful perspectives, and scholarly mentorship have profoundly enriched my academic journey and shaped the trajectory of this endeavor. I am grateful for their generosity in sharing their scholarly wisdom, professional networks, and research resources, which have broadened my intellectual horizons and fostered a spirit of collaboration and collegiality. Their mentorship has not only nurtured my academic growth but has also instilled in me a sense of confidence and resilience as I navigated the complexities of academic inquiry and scholarly discourse. I am indebted to them for their unwavering belief in my potential, their steadfast encouragement during moments of doubt, and their genuine investment in my academic and professional development. Their mentorship extends beyond the confines of this research project proposal, leaving an indelible imprint on my scholarly pursuits and shaping my aspirations for the future.

In conclusion, I extend my deepest gratitude to Dr. Naomi Njoroge and Dr. Wanjiru Nderitu for their exemplary mentorship, scholarly guidance, and unwavering support, without which this research project would not have been possible. I am truly fortunate to have had the privilege of their mentorship on my academic journey.

TABLE OF CONTENTS

DECLARATION ..... **i**

DEDICATION ..... **ii**

ACKNOWLEDGEMENT ..... **iii**

TABLE OF CONTENTS ..... **iv**

LIST OF TABLES ..... **viii**

LIST OF FIGURES ..... **ix**

ABSTRACT **1**

DEFINITION OF TERMS **2**

ABBREVIATIONS/ACRONYMS **3**

CHAPTER ONE: INTRODUCTION AND BACKGROUND OF THE STUDY **4**

1.1 Introduction 4

1.2 Background of Study 4

1.2.1 Sustainability of Income Generating Activities 5

1.2.2 Environmental Factors 7

1.2.3 Environmental Factors and Sustainability of Income Generating Activities 8

1.2.4 Overview of Environmental Factors and Sustainability of Income Generating Projects 9

1.2.5 Profile of Kamar Pastoral Field School 10

1.3 Statement of the Problem 11

1.4 Purpose of the Study 12

1.5 General Objectives 13

1.5.1 Specific Objectives 13

1.6 Research Hypothesis 13

1.7 Significance of the Study 14

1.8 Scope of the Study 14

1.9 Delimitation(s) of the Study 15

1.10 Limitations of the Study 15

1.11 Assumptions of the Study 15

1.12 Theoretical Framework 15

1.12.1 Resource Dependency Theory 16
1.12.2 Profit Maximization Theory 17
1.13 Conceptual Framework 19
CHAPTER TWO: LITERATURE REVIEW 20
2.1 Introduction 20
2.2 Empirical Literature 20
2.2.1 Physical Resource and Sustainability of Income Generating Activities 20
2.2.2 Social Cultural Factors and Sustainability of Income Generating Activities 23
2.2.3 Ecological Resources and Sustainability of Income Generating Activities 25
2.3 Summary of Review of Literature and Research Gaps 27
CHAPTER THREE: RESEARCH METHODOLOGY 33
3.1 Introduction 33
3.2 Research Design 33
3.3 Research Site 33
3.4 Population of the Study 34
3.5 Study Sample 34
3.5.1 Sample size 34
3.5.2 Sampling Procedure 35
3.6 Data Collection 36
3.6.1 Research Instruments 36
3.6.2 Piloting of Research Instruments 37
3.6.3 Validity of the Instruments 37
3.6.4 Reliability of Instruments 37
3.7 Data Collection Procedure 38
3.8 Data Analysis and Presentation of Findings 38
3.9 Ethical Considerations 39
CHAPTER FOUR: DATA PRESENTATION, INTERPRETATION AND DISCUSSION 40
4.1 Introduction 40
4.2 Questionnaire Response Rate 40

4.3 Reliability of the Research Instrument 40
4.4 Validity of the Research Instrument 41
4.5 Demographic Characteristics of the Respondents 41
4.5.1 Gender of the Respondents 42
4.5.2 Level of Education Respondents 42
4.5.3 Position of Community Respondents 43
4.5.4 Age Category of Respondents 43
4.6 The Assessment of Environmental Factors and Sustainability of Income Generating Activities of Kamar Pastoral Field School 44
4.6.1 Descriptive Data on the Physical Resources Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 44
4.6.2 Inferential Statistic for Physical Resources Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field 46
4.6.3 Regression of Physical Resources Influence on Sustainability of Income Generating Activities of Kamar Pastoral Field 47
4.6.4 Qualitative Data on the Influence of Physical Resources on the Sustainability of Income-Generating Activities of Pastoral Field Schools 49
4.6.5 Physical Resources and Sustainability of IGAs of Kamar Pastoral Field School 49
4.7 Socio-Cultural Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 50
4.7.1 Descriptive Data on Socio-Cultural Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 50
4.7.2 Inferential Statistic for Social-Cultural influences on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 52
4.7.3 Regression of Social-Cultural Influence on Sustainability of Income Generating Activities of Kamar Pastoral Field School 53
4.7.4 Qualitative Data on the Influence of Socio-Cultural Factors on the Sustainability of Income-Generating Activities of Pastoral Field Schools 55
4.7.5 Socio-Cultural Factors and Sustainability of IGAs of Pastoral Field Schools 55
4.8 Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 56
4.8.1 Descriptive Data on Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 56
4.8.2 Inferential Statistic for Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 58

4.8.3 Regression of Ecological Influence on Sustainability of Income Generating Activities of Kamar Pastoral Field Schools 59

4.8.4 Qualitative Data on the Influence of Ecological Factors on the Sustainability of Income-Generating Activities of Pastoral Field Schools 60

4.8.5 Ecological Factors and Sustainability of IGAs of Kamar Pastoral Field School 61

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS 62

5.1 Introduction 62

5.2 Summary of Findings 62

5.2.1 To Assess How Physical Resources Influence the Sustainability of Income Generating Activities of Pastoral Field Schools; Baringo County 63

5.2.2 To Establish How Socio-Cultural Factors Influence Sustainability of Income Generating Activities of Pastoral Field Schools; Baringo County 63

5.2.3 To Determine How Ecological Factors Influence Sustainability of Income Generating Activities of Pastoral Field Schools; Baringo County 64

5.3 Conclusions 64

5.4 Recommendations 65

5.4.1 Practical Actions 65

5.4.2 Policy Action 66

5.5 Suggested Areas of Further Studies 66

REFERENCES 68

APPENDICES 71

Appendix I: Questionnaire to be issued to Kamar Pastoral Field School Leaders, Members, County Government Employees, Community Elders and Faith Based Organizations. 71

Appendix II: In-depth Interview Guide 76

Appendix III: Validity of research Instruments 77

Appendix IV: National Commission for Science, Technology and Innovation Research Permit . 79

LIST OF TABLES

Table 2.1: Research Gaps 28

Table 3.1: Target Population Distribution 34

Table 3.2: Reliability Statistics 38

Table 4.1: Questionnaire Return Rate 40

Table 4.2: Reliability Statistics 41

Table 4.3: Demographic Characteristics of Respondents 41

Table 4.4: Physical Resources Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 44

Table 4.5: Statistical Outputs for Physical Resources Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 46

Table 4.6: Model Summary 47

Table 4.7: Analysis of Variance 47

Table 4.8: Coefficients 48

Table 4.9: Socio-Cultural Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 50

Table 4.10: Statistical Outputs for Cultural-Cultural Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 52

Table 4.11: Model Summary for Socio-Cultural Factors 53

Table 4.12: ANOVA table for Socio-Cultural Factors 54

Table 4.13: Coefficients Table for Socio-Cultural Factors 54

Table 4.14: Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 56

Table 4.15: Statistical Output for Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School 58

Table 4.16: Model Summary for Ecological Factors 59

Table 4.17: ANOVA for Ecological Factors 59

Table 4.18: Coefficients for Ecological Factors 60

LIST OF FIGURES

Figure 1.1: Conceptual Framework 19

ABSTRACT

The assessment of environmental factors on the sustainability of income-generating activities has emerged as a critical area of research. This study aimed at assessing the Environmental Factors and Sustainability of Income Generating Activities of Pastoral Field Schools in Baringo County, Kenya: A Case of Kamar Pastoral Field School in Mogotio Sub County. The specific objectives of the study were to assess how physical resources, socio-cultural factors and ecological factors influence the sustainability of income generating activities of Pastoral Field Schools in Baringo County, Kenya. The study utilized the Resource Dependency theory and the theory of Profit Maximization as a guiding framework to have in-depth understanding of how organizations initiate entrepreneurial activities to supplement its income and maximize its profit. The target population for the study was 600 and the sample size was 240 which was determined using Yamane Taro's formula. The respondents were proportionately selected using stratified random simple sampling method. Key informants were purposively selected from relevant departments. Research instruments used were questionnaires and key informants' guides. The reliability and validity of the instruments were evaluated through Cronbach's alpha analysis whereby, the variables in the study surpassed the cutoff value of 0.7, suggesting that the constructs were reliable. Descriptive statistics were used to summarize the data for each of the study's objectives. Inferential statistics, including correlation and regression analyses, were employed to understand the relationships between the variables. Qualitative data was collected through interviews and analyzed using a qualitative approach that involved identifying patterns, trends, relationships, and themes in the data obtained. The results revealed that there was a significant relationship between Physical resources and sustainability of income generating activities of Kamar Pastoral Field School on account of Pearson Chi-square statistic being (0.903, $p < 0.01$). Additionally, the test revealed that there was significant relationship between both social-cultural factors and ecological factors and sustainability of IGA of Kamar Pastoral Field school on account of Pearson Chi-square statistic being ($r = 0.899$, $p < 0.01$), and ($r = 0.920$, $p < 0.01$) respectively. The findings emphasized the importance of physical resources, social cultural factors and ecological factors on the sustainability of income generating activities. Based on the study's conclusions, policy and practice recommendations, support for the expansion of farm sizes, encourage practices that allow for larger farm sizes can help pastoralists take advantage of economies of scale, improving resource management and overall productivity. Larger farms can support more sustainable and efficient operations, contributing to the long-term viability of pastoral income-generating activities. Further research should focus on exploring the impact of gender roles and dynamics on the sustainability of income generating activities (IGAs) and particularly on the involvement of women as well as understanding how gender influences decision-making, resource access, and participation in IGAs. This can provide insights on how to promote greater gender equity and enhance the sustainability of IGAs. Further research should also be conducted to assess the long-term impacts of climate change on pastoral livelihoods and IGAs as well as comparison of the sustainability of IGAs in different pastoral communities across Kenya can help identify best practices and common challenges. Such studies would highlight successful strategies and areas needing improvement, offering a broader perspective on how different communities manage their IGAs and what factors contribute to their success or difficulties.

DEFINITION OF TERMS

Sustainability refers to the capacity to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. It encompasses the responsible use of natural resources, the protection of ecosystems, social equity, and economic viability.

Income generating activities: refer to activities that are focused on creating opportunities for communities and farmers to use locally available resources productively, to be less dependent on the government and donors, to be more self-reliant and to be able to take care of themselves.

Social Cultural Practices: refers to the behaviors, customs, traditions, and rituals that define a specific society or cultural group. These practices involve a diverse array of activities, beliefs, norms, and values transmitted across generations within a society.

Physical factors: refer to as assets that are brought into reality by the processes of economic production which may consist of natural resources, tools, and machinery, land, markets among others. In the context of this study, physical resources have been categorized to include land, road networks and markets which are at the disposal of Kamar PFS.

Ecological Factors: relate to physical resource, socio-cultural factors and ecological factors that contribute to income sustainability of a group. Physical resources are defined as resources that aid in production as goods and services.

Pastoralist Field School: is an educational program designed to provide training and support to pastoralist communities, who rely primarily on livestock farming for their livelihoods. These field schools typically offer practical training in various aspects of animal husbandry, range management, sustainable grazing practices, and natural resource management.

ABBREVIATIONS/ACRONYMS

ASAL	Arid and Semi-Arid Lands
FAO	Food and Agriculture Organization
IDI	in-depth interview
IGA	Income Generating Activities
MC	Marginal Cost
MR	Marginal Revenue
PFS	Pastoral Field Schools
RPLRP	Regional Pastoral Livelihood Resilience Project
SPSS	Statistical Package for Social Sciences

CHAPTER ONE: INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

Environmental factors are essential for sustainability of income-generating activities especially for Pastoralist. Good practice such as livestock rearing, agriculture, and other economic ventures contribute to environmental stewardship and long-term viability of income sustainability. This section focused on background information, problem statement, purpose and objectives of the study, research hypotheses and significance of assumptions, theoretical framework and conceptual framework of the research.

1.2 Background of Study

The effects of climate change have been faced throughout the world. One of the areas hit the hardest by climate change has been the agricultural sector. Unlike before, farmers can no longer rely on rain to support their agricultural production activities. In response to the changing climate, farmers have been faced with challenges such as increased globalization and population pressures that have made agricultural activities untenable. The impacts are even worse for pastoral communities across the world who move from place to place in search of pasture for their livestock. According to Oywaya et al. (2011), climate change coupled with population pressure has forced pastoral farmers to adopt alternative socio-economic activities.

Due to the many challenges facing modern-day farmers, governments have been providing extension services to farmers so that they may develop the knowledge, skills, and competencies needed to address the complex challenges facing the sector. Van den Berg et al., (2020) noted that farmers today are faced with many challenges, including in

adequate physical resource population pressures, climate change, land degradation, and loss of natural resources; these challenges make farming difficult in the modern world.

Further, in contemporary discourse on sustainability and economic development, the intricate interplay between environmental factors and human activities has garnered significant attention. Central to this discourse are three primary variables that underpin the dynamics of sustainability: social-cultural practices, physical factors, and ecological factors. Understanding the multifaceted nature of these variables is essential for assessing their impact on the sustainability of income-generating activities and shaping strategies for long-term environmental stewardship and economic prosperity.

1.2.1 Sustainability of Income Generating Activities

Income-generating activities (IGAs) refer to activities that are focused on creating opportunities for communities and farmers to use locally available resources productively, to be less dependent on the government and donors, to be more self-reliant and to be able to take care of themselves (Niekerk, 2009). According to ACF International (2009), IGAs helps the vulnerable populations of the society cover their basic needs and food supplies in a sustainable manner through the income they produce.

Mehra (1997) noted that income generating activities provide additional benefits that lead to reduction of poverty and improved wellbeing of communities in a way that promotes empowerment, self-reliance, and community development. Muhammad, Khan & Farah (2006) defined income generation as an act that promotes poverty reduction by providing substitute resources to the community through increase of economic activities with the objective of increasing the capacity of a society to create more money to increase income, to improve livelihoods and living standards, build resilience and sustainability.

The sustainability of income generating activities is the ability of activities to generate ongoing revenue and benefits overtime while minimizing negative impacts on the environment, society, and economy. It involves creating initiatives or ventures that can maintain or increase their productivity, profitability, and positive impact in the long term.

Income-generating activities should be financially viable and capable of generating profit or revenue or revenue streams that cover costs and provide a return on investment. This involves sound financial planning, efficient resource management, and the ability to adapt to changing market conditions. Akerele and Aihonsu (2011) noted that participating in income generating activities (IGAs) was crucial for development and especially for developing countries like Kenya.

Sustainability entails ensuring that income-generating activities contribute to social inclusion, equity, and empowerment. This may involve providing promoting gender equality, supporting local communities, and respecting cultural values and rights; Environmental Responsibility which involves Sustainable income-generating activities should minimize negative environmental impacts such as pollution, resource depletion habitat destruction and climate change.

Numerous issues arise concerning the sustainability of pastoral systems in Africa (Blench, 2001; FAO, 2001). Primarily, there is apprehension about whether pastoral systems can support increasing human populations while adhering to the limitations imposed by available resources in arid agro-ecosystems. (Fratkin and Mearns, 2003; McCabe et al., 2010; Thebaud and Batterbury, 2001). There is worry that pastoral production systems might not be sustainable due to potential adverse interactions

between livestock and the land and water resources upon which they rely (Behnke, 1994). In addition, there are concerns regarding the suitability of policy responses aimed at facilitating the utilization of dryland resources for livestock production, as highlighted in various studies (FAO, 2001 and Benjaminsen, 2008). Hence, the evaluation of pastoral livelihood sustainability should consider physical, ecological, and socio-cultural factors.

1.2.2 Environmental Factors

The environmental factors relate to physical resource, socio-cultural factors and ecological factors that contributes to income sustainability of a group. Physical resources are defined as resources that aid in production as goods and services (Graham and Harvey, 2001). These resources include good roads, tools, markets, agricultural resources such as livestock, crops, and land among others. Socio-cultural factors are the organization's social relations, values, level of education, age and interaction attitudes of employees who have contributed to the social and cultural development in the organization.

Coleman (1988) defined socio-cultural factors as a variety of different entities which consist of aspects of social structure that facilitate certain actions. According to Putnam (1993), social resources are viewed as a set of horizontal associations between people, it contains social networks and norms that impact social productivity. Ecological factors relate to land degradation and climate change, which has made pastoral farming untenable.

1.2.3 Environmental Factors and Sustainability of Income Generating Activities

1.2.3.1 Physical Resources

Physical resources are important in any group set up since they enhance the proper functioning of a group. Lack of resources and inability to access resources possess challenges to sustainability of income generation.

Physical resources consist of assets that are brought into reality by the processes of economic production (Elly, 2000). These assets may consist of natural resources, tools, and machinery, land, markets among others. In the context of this study, physical resources have been categorized to include land, road networks and markets which are at the disposal of Kamar PFS. Alignment of these resource in the right quantity and quality ensures achievements of organization objectives (Macibi, 2003).

1.2.3.2 Socio-Cultural Factors

Socio-cultural factors entail the behaviors, customs, traditions, and rituals that define a specific society or cultural group. These practices involve a diverse array of activities, beliefs, norms, and values transmitted across generations within a society. Many pastoral communities are faced with numerous problems and challenges directly arising from their pastoral way of life. According to Muhammad et al. (2019), these challenges are mainly from a socio-cultural dimension and are compromising the extent to which these people can support their livelihoods. There have been conflicts between different pastoral communities, with these groups mainly depending on livestock keeping as the main source of income therefore fighting over limited grazing land (Manu et al., 2014).

Providing alternative solutions to these groups may reduce these challenges. In addition, the level of literacy affects the functioning of a family, type of employment and

occupation (Ackello et al., 1997). Further it helps one to read market signals and have a better chance of accessing them. Geda et al, (2001) argued that lack of education is the basis that can lead to fear to invest in production resources, limitation of capacity to absorb risks, and a general lack of information.

1.2.3.3 Ecological Factors

Ecological factors pose challenges mainly that relate to land degradation, drought, and climate change, which has made pastoral farming untenable. The severity of drought primarily hinges on the extent of moisture deficiency, its duration, and, to a lesser degree, the scale of the affected region. Initially, drought effects are most noticeable in agriculture due to diminished soil moisture and increased evapotranspiration.

Agrarian communities consistently experience more pronounced impacts from drought compared to non-agrarian populations. Rural economies in many developing nations heavily rely on agriculture, which is predominantly rain-fed (Ashraf and Routray 2013). Drought can lead to shortages in both surface and groundwater resources and profoundly affect crop yields and livestock rearing.

1.2.4 Overview of Environmental Factors and Sustainability of Income Generating Projects

Globally, environmental factors significantly impact the sustainability of income-generating activities and projects. Physical factors, socio-cultural factors and ecological factors are major concerns. Projects worldwide must adapt to changing weather patterns, manage natural resources responsibly, and incorporate sustainable practices to remain viable. International policies and frameworks, such as the United Nations Sustainable Development Goals (SDGs), provide guidelines for integrating sustainability into economic activities.

Regionally, especially within Sub-Saharan Africa, environmental factors pose significant challenges. The region's heavy reliance on agriculture and natural resources makes it particularly vulnerable to environmental changes. Sustainable income-generating activities must address these issues. Regional organizations and agreements, such as the African Union's Agenda 2063, emphasize sustainable development and environmental protection.

In Kenya, environmental factors play a crucial role in the sustainability of income-generating activities and projects particularly in rural and pastoral communities. The key environmental challenges include climate variability and Change, frequent droughts, erratic rainfall patterns, and extreme weather events that affect agricultural productivity. Understanding and addressing these environmental factors at global, regional, and local levels, stakeholders can enhance the sustainability and resilience of income-generating projects of Pastoral Field Schools.

1.2.5 Profile of Kamar Pastoral Field School

Kamar Pastoral Field School (PFS) was among six (6) PFS's that were established in Baringo County through the Regional Pastoral Livelihood Resilience Project (RPLRP) which was a World Bank and Government of Kenya funded project with the objective of enhancing the livelihood resilience of pastoral and agro-pastoral communities in drought prone areas of 14 ASAL counties (Baringo, West Pokot, Turkana, Narok, Kajiado, Marsabit, Samburu, Laikipia, Isiolo, Mandera, Wajir, Garissa, Tana River and Lamu) of Kenya. Kamar community is in Kamar Location, Emining ward, Mogotio Sub County of Baringo County and has a population of 1,614 as per the 2019 census. The main livelihood activities in the area include crop and livestock rearing.

Kamar PFS community was targeted by the project based on their vulnerability to drought and climate related hazards, lack of non- state actors, and difficult accessibility due to poor road network, low land productivity and high livestock diseases that make the community vulnerable. Putting into consideration the magnitude of vulnerability of the community to harsh climate change associated hazards, RPLRP targeted the community to build their capacity and enable them develop community focused disaster risk reduction strategies.

The establishment of the PFS at Kamar allowed for a field-based training on PFS approaches and methodologies which resulted in the start-up of several income generating activities as part of their livelihood diversification strategies for building community resilience and increasing drought preparedness against weather related shocks.

1.3 Statement of the Problem

Environmental factors such as physical resources, social cultural and ecological factors are perceived to have influence on sustainability of income generation of a pastoral field schools. Further members of field schools are required to be supported with proper skills and appropriate incentive to take advantage of resources around them and become productive. According to (Brown et al., 2020) environmental factors can help achieve the goals of a group by utilizing the available resource to sustain its livelihood. The integration of these factors leads to a synergistic effect where the strengths of one area support the others. By considering and optimizing these environmental factors, organizations and communities can create resilient and sustainable income generation

activities that adapt to changing conditions and continue to provide economic benefits over the long term.

Despite the recognition that environmental factors such as physical resources, social, cultural, and ecological elements influence the sustainability of income generation in pastoral field schools, there remains a significant gap in the practical application of this knowledge. Members of field schools often lack the necessary skills and appropriate incentives to effectively utilize the resources around them and achieve productivity. As noted by Brown et al. (2020), environmental factors can significantly aid in achieving group goals by leveraging available resources to sustain livelihoods.

However, the potential for a synergistic effect, where the strengths of one area support the others, is not fully realized. To bridge this gap, it is essential to provide targeted support and training to field school members, ensuring they can optimize environmental factors to create resilient and sustainable income generation activities that can adapt to changing conditions and provide long-term economic benefits.

This study aims to explore and implement strategies for skill development and incentive structures that will empower pastoral field school members to harness environmental factors effectively, fostering sustainable and resilient income generation practices.

1.4 Purpose of the Study

The purpose of this study was to examine the role of pastoral field schools in supporting the development of sustainable income generating activities for pastoral farmers and the factors determining the long-term sustainability and productivity of these activities for the farmers.

1.5 General Objectives

The general objective of this study was to assess the Environmental factors and sustainability of income generating activities of Pastoral Field Schools.

1.5.1 Specific Objectives

The following specific objectives guided the study.

i. To assess how physical resources influence sustainability of pastoral field schools' projects income generating activities in arid and semi-arid counties in Kenya

ii. To establish how socio-cultural factors influence sustainability of pastoral field schools' projects income generating activities in arid and semi-arid counties in Kenya

iii. To determine how ecological factors influence sustainability of pastoral field schools' projects income generating activities in arid and semi-arid counties in Kenya

1.6 Research Hypothesis

H01: There is no significant relationship between physical resources and **s**ustainability of pastoral field schools' projects' income generating activities in arid and semi-arid counties in Kenya

H02: There is no significant relationship between Socio cultural factors and **s**ustainability of pastoral field schools' projects' income generating activities in arid and semi-arid counties in Kenya

H03: There is no significant relationship between ecological resources and **s**ustainability of pastoral field schools' projects' income generating activities in arid and semi-arid counties in Kenya

1.7 Significance of the Study

This study is important to the Pastoral communities who engage in Pastoral Field Schools. It provides insights of how physical, socio-cultural and ecological resources would influence sustainability of income generating activities of pastoral field schools particularly in ASAL areas.

The research will guide relevant Policy makers, donors, and farmers, to take appropriate interventions in promoting income generating activities practiced by the pastoralist communities which will enhance their performance and foster sustainability. This study will also benefit the entire community of Kamar and other neighbouring communities as it provides specific information on how physical, socio-cultural, and ecological factors influence the sustainability of their income generating activities.

Further, this study will contribute to the existing body of knowledge with respect to environmental factors and sustainability of income generating activities (IGAs).

1.8 Scope of the Study

This research was conducted in Kamar Pastoral Field School located in Baringo County. The primary focus of the study was to assess the environmental factors that influence the sustainability of income-generating activities in this pastoral field school. Specifically, the study examined the impact of physical, socio-cultural, and ecological factors on the sustainability of these activities. By concentrating on these three dimensions, the research aimed to provide a comprehensive understanding of how various environmental elements contribute to the long-term viability and productivity of income-generating initiatives within the Kamar Pastoral Field School.

1.9 Delimitation(s) of the Study

The study was delimited to Kamar pastoral field school in Baringo County. Recently the interest of Pastoralist field school has been getting attention from County Governments, donors and other different actors, therefore encouraging such groups to mushroom within the same locality. This study focused on Kamar pastoral field school with the intention of getting optimal and effective results.

1.10 Limitations of the Study

The limitation of this study was expected to be accessing Kamar area due to terrain challenges and the process of accessing all the respondents. In addition, language barrier was expected to be a challenge in this study, especially when carrying out interviews, this was because not all members of this group are literate. Resource scarcity is also expected to be a limitation of this study.

1.11 Assumptions of the Study

This study assumed that respondents will be able to discuss income generating activities which they participate in and the challenges they face while executing them. In addition, the study assumed that the participants will be able to give recommendations that will be used by state actors and non-state actors to come up with policies that promote communities that practice pastoral field schools. The study assumes that there will be significant relationship between productivity of the field schools and physical, socio-cultural, and ecological factors upon which the three hypotheses were developed.

1.12 Theoretical Framework

This study employed two theories which are Resource Dependency theory and Profit Maximization theory.

1.12.1 Resource Dependency Theory

The Resource dependency (RDT) theory was developed primarily in the field of organizational studies. According to Pfeffer and Salancik (1978) who laid the groundwork of the theory and proponents of the theory opined that organizations are dependent on external resources to survive and thrive. They further suggested that the structure and behavior of organizations are influenced by their need to acquire and control critical resources from external sources.

Furthermore, the theory explains the way organizations initiate entrepreneurial activities to supplement their income. RDT was founded on the values of open system theory which established that as much as organizations have resources internally, the resources are limited and cannot fully satisfy its financial needs hence they are forced to look for resource externally to complement what they have internally (Gulati& Sytch,2007). It is on this ground that organizations are always forced to initiate entrepreneurial activities to seek alternative ways of earning income to secure the organization from risks, bankruptcy, and uncertainties.

Inadequacy of self- sufficiency resources generates great possibility of depending on other parties, this aspect of dependency creates uncertainty in organization and especially on decision making processes because they do not directly have the ability to control flow of resources from the outside environment, the theory present the component of high firm power as a strategy of propelling the management of the outside environment and flow of resource in the organization. Although organizations have different levels of dependency on resources from the outside environment, subsequently, lack of control of the outside environment may affect the performance and achievement

of any organization which may pose threats to the survival of such organizations (Heeley et al 2006).

Regarding the above statement, the theory posit that organizations can control the outside environment by applying the following strategies: reduce organization interdependency through diversification or integration; instituting a collective structure to create an environment that can be negotiated and utilizing legal, political, and social action to create a conducive environment (Pfeffer & Salancik 1973). Based on this background organizations should thrive to actively control the resource to attain organizational goals and achieve organizational superior financial performance. Lastly the theory encourages that organizations should battle the element of up-surging resource dependency and uncertainties by effectually managing outside resources to its gain and thus enabling institution to create wealth and guarantee self-sufficiency.

Overall, resource dependency theory provides insights on valuable frameworks for understanding the dynamics of organizational behavior and strategy in relation to external resource dependencies. It underscores the importance of analyzing the external environment and interorganizational relationships in shaping organizational decisions and outcomes.

1.12.2 Profit Maximization Theory

Profit maximization theory is a fundamental concept in business management that suggests that the primary objective of a firm is to maximize profits. The theory posits that firms will allocate resources in such a way as to generate the highest possible level of profit, given the constraints they face, such as market demand, production costs, and competitive pressures.

Friedman (1970) a Proponent of profit maximization theory argued that it provides a clear and objective goal for firms, which can serve as a basis for decision-making and resource allocation. He contended that by pursuing profit maximization, firms can efficiently allocate resources, innovate, and grow, ultimately benefiting both shareholders and society. Furthermore, he argued that the sole responsibility of a business is to increase its profits within the constraints of the law and ethical customs, and by doing so, businesses fulfill their role in society by efficiently allocating resources and providing goods and services demanded by consumers. In addition, the theory assumes that the smallholder farmers are profit maximizing economic agents and are thus efficient producers.

The profit-maximization assumption is the guiding principle underlying short-run production by a farm. It is assumed that firms undertake actions and make the decisions that increase profit. The goal of a firm's owners will usually want the firm to earn as much profit as possible. Profit is defined as the firm's sales revenue minus its costs of production. When MR is positive, an increase in output causes total revenue to rise. Each time output increases, Marginal Revenue (MR) is smaller than the price the firm charges at the new output level. Marginal revenue and marginal cost (MC) can be used to find the profit-maximizing output level. An increase in output always raise profit if marginal revenue is greater than marginal cost (MR > MC). In the real world, firms must engage in trial-and-error discovery processes, searching for the profit-maximization point. The process can be clearly described by the marginal revenue-marginal cost rule, which is an interaction of factors influencing firm production and sales (Snyder et al., 2008). These

factors vary from socio-cultural, physical resources, and ecological resources in our study.

1.13 Conceptual Framework

The conceptual framework shows the interactions between environmental factors and sustainability of income generating activities of pastoral field schools. The independent variables are represented by assessing environmental factors, while productivity and sustainability of income generating activities define the dependent variable.

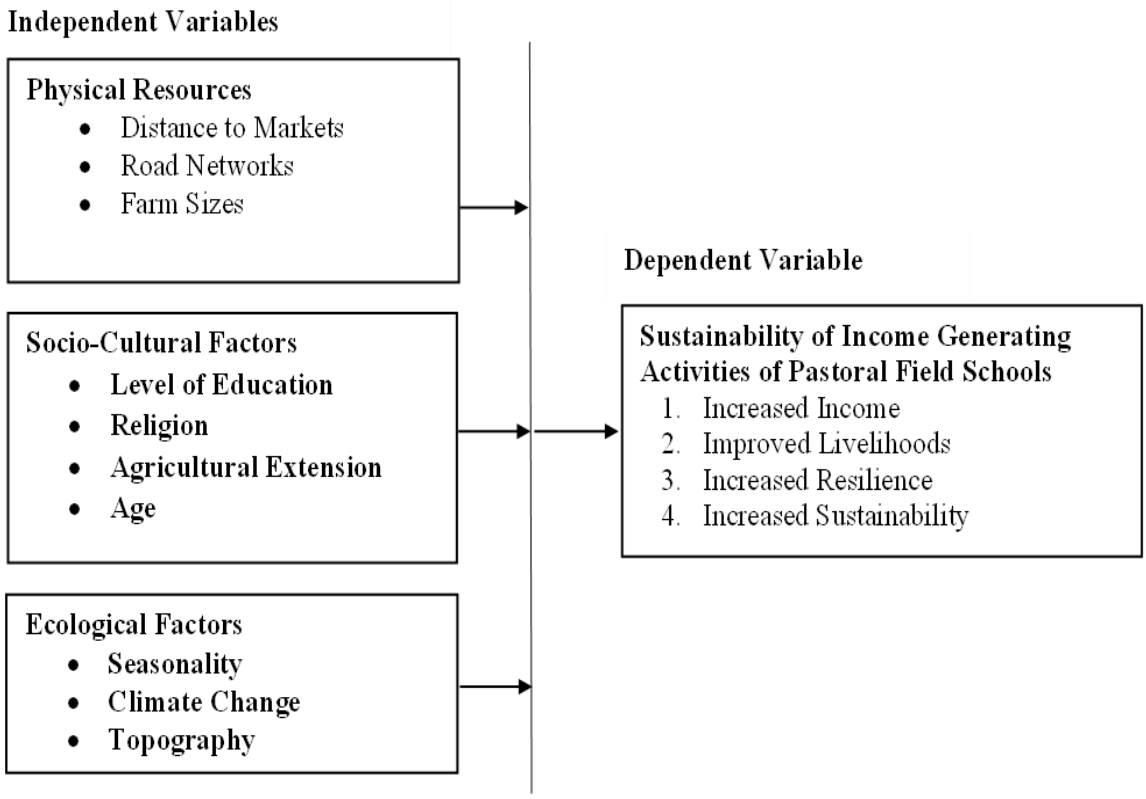


Figure 1.1: Conceptual Framework

Source: Author (2024)

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter, the study focuses on the theoretical framework and empirical literature review. The theoretical review reflects on various theories relevant to this study. The chapter also presents an empirical literature review on all study variables, including physical resources, socio-cultural factors, ecological resources, and other aspects related to the sustainability of income-generating activities in pastoral field schools. The chapter concludes by identifying and capturing gaps in the existing literature.

2.2 Empirical Literature

This section discussed and reviewed recent studies and previous studies related to environmental factors that influence sustainability of income generating activities.

2.2.1 Physical Resource and Sustainability of Income Generating Activities

Studying the interplay between physical resources and sustainability of income generating activities is a crucial research domain that highlights the diverse aspects contributing to project success**.** Physical resources are defined as resources that aid in production as goods and services (Graham and Harvey, 2001). These resources include good roads, tools, markets, agricultural resources such as livestock, crops, and land among others. The relationship between these elements greatly shapes the viability and sustainability of income generating activities.

The long-term sustainability of income-generating activities relies heavily on the complex interaction of physical factors, which include various aspects such as financial resources, market dynamics, cost-effectiveness, and the wider physical environment. Access to sufficient physical resources stands out as a key determinant of income sustainability (Brush & Hisrich, 2022)

The availability of physical resources in an organization and constantly pursuing new methods to improve on its management is indeed an appropriate way to enhance sustainability and get maximum return on investments (Maletic, et al, 2020).

Globally, household or group income serves as a critical prerequisite for enhancing sustainability and improving quality of life. Shonia (2012) conducted a study examining household income among rural women and the factors influencing Income Generating Activities (IGA) in Bangladesh. The researcher suggests that rural households possess both tangible and intangible assets enabling them to fulfill their needs. The study highlights that income relies on a sustainable blend of these resources, where certain resources may serve as prerequisites for others due to their interconnected nature. Hence, individuals require a diverse range of resources to achieve favorable livelihood outcomes (Scoones, 1998). Rural women need various combinations and components of capital assets to engage in income-generating activities.

The presence or absence of these capital assets' components can either facilitate or hinder the likelihood of success. Additionally, the study indicates that limited access to finance, land, education, and restricted road networks among rural women negatively impacts income generation. The study underscores the importance of accessing resources such as physical, human, and financial assets for the sustainability of rural women. The study employed structured and semi-structured interview schedules along with other participatory appraisal tools, the study findings reveal that although the studied women are involved in various income-generating activities, their personal annual income from these IGAs is not substantial. However, the study did not provide an effective strategy for income generation and sustainability.

A study conducted by (Kipkoech, 2018) on determinants of implementation of income generating activities in secondary schools in Konoin District, Bomet County had one of the objectives of the study being to establish whether financial and physical resource affected the implementation of income generating activities. The study underscored the importance of both human and non-human resources linking their right alignment to realization of institutions objectives. The study further pinned the vital role of physical resource in an organization as a mean of acquiring other important resource which ensures sustainability in the long run, he further alluded that lack of physical resources impacted negatively on the performance of students in a learning institution and that lack of this resource is a constraint to new ventures and sustainability of income generating activities. The results indicated that while financial resources were insufficient, most schools possessed satisfactory physical resources. Both categories of resources emerged as distinct predictors of school IGA engagement, however this study did not give distinct definition of physical resources.

Study conducted by, (Odingo2010) on the factors that influence sustainability of Income Generating Activities (IGA) among women in Nyando division, Nyando district illustrated the importance of availability of physical resource on sustainability of income generation. The researcher utilized a descriptive methodology aimed at soliciting the opinions and perspectives of the respondents. The findings regarding physical factors indicated that road and communication networks significantly influence income-generating activities (IGA), particularly concerning the marketing of produce. Although the study was able to establish that the variables in the study had correlation with income generating activity, it did not correlate it with sustainability ugh the study was able to

establish that the variables in the study had correlation with income generating activity, it did not correlate it with sustainabilit**y.**

2.2.2 Social Cultural Factors and Sustainability of Income Generating Activities

Social-cultural refers to social and cultural factors that are common to a group, organization, or population in terms of their traditions, habits, patterns, and beliefs. With respect to an organization, it refers to the organization's social relations, values, level of education, age and interaction attitudes of employees who have contributed to the social and cultural development in the organization. Social-cultural factors interact closely, culture shapes social structures and norms, and it influences how individuals interact with one another and with society at large (Calhoun, 2002). Shivani et al., (2006) noted that non-economic factors such as socio-cultural factors have well been accepted as influential drivers for income generating activities. Thornton et al. (2011) noted that those engaged in income generating activities and public policymakers are showing growing interest in the contextual factors that drive income generating activities. They pointed out two specific contexts, culture and society, that are worth examining. Income generating activities can be deemed as a social phenomenon (Thornton et al., 2011). Therefore, the role of social influence should not be neglected. Meek et al. (2010) found that those engaged in income generating activities behaved sustainably and were influenced by social norms.

O'Neill et al. (2009) noted that culture influences all aspects of a group, population, or an organization, such as management, leadership, decision making and sustainability of income generating activities. Still yet, cultural factors are scarcely analyzed and discussed in the literature. Specifically, discussion regarding the influence of cultural factors on sustainability of income generating activities remains low.

Coleman (1988) defined social cultural as a variety of different entities which consist of aspects of social structure that facilitate certain actions. According to Putnam (1993), social resources are viewed as a set of horizontal associations between people, and it contains social networks and norms that impact social productivity.

Access to social resources plays a significant role in financial sustainability of an organization Narayan and Pritchett (1997). Different researchers have conducted studies to establish the impact of access to social resources and financial sustainability of an organization. Park and Kim (2008) examined the impact of access to social resources on the performance of small and medium enterprises in the Republic of Korea. The study employed econometric methods where binary probit regression method was utilized. The study findings revealed that access to social resources was significantly associated with higher profitability and a greater likelihood of survival for the businesses. The study was however limited because it did not in-depth specify the elements of social resources utilized by small and medium enterprise.

Nuryani et al, (2018) conducted a study to determine the influence of social cultural factors on sustainability of financial status of organization. The study employed descriptive and inferential statistics to analyze their data. The findings showed that social culture was positive and significant to the financial sustainability of the organization. However, the study was limited since it did not indicate how social factors led to sustainability of income generating activities.

Grootaert (1999), highlights the vital influence of social cultural factors on poverty and welfare in Indonesia. In terms of financial sustainability, social cultural factors can enhance the ability of a firm to perform better. Access to social networks and

institutions such as credit facilities and agricultural extension services to a greater extent influences the sustainability of income generating activities.

Schwarze (2004) carried out a study to establish the influence of social networks on income generating activities and incomes sustainability, the study included a social resources index that measured the influence that a member has in accessing social networks such extension services. The study found that a member or group that has access to social networks have a positive effect on income sustainability and performance of an organization. This study was limited because it did not consider ecological factors.

The level of education of an employee has a greater influence on the performance of an organization in general. Barrett et al. (2001) in his study to investigate the Nonfarm income diversification and household livelihood strategies in rural Africa found a strong positive relation between education and financial performance of the studied group, nonetheless Jolliffe (1998) in his research to investigate the skills, schooling, and household income in Ghana, found that schooling has a negative influence on financial performance of a group that engage in agricultural activities, in contradicting the findings of jolliffe, Yunez-Naude (2000) in his study found that institution who engage well trained and educated employees, have high return in terms of profits and performance.

2.2.3 Ecological Resources and Sustainability of Income Generating Activities

Environmental factors refer to the physical conditions within the environment, encompassing elements like climate change, natural disasters, energy availability, and pollution levels. These factors significantly influence business operations and growth trajectories. Akinbami et al. (2019) conducted a study that examined past and present practices associated with climate change adaptation in two rural areas within Oyo State. They scrutinized the concept of climate entrepreneurship and evaluated its efficacy. The

study employed a descriptive research approach to investigate the interventions implemented in recent years. The study indicated that climate change impacted entrepreneurship by altering soil fertility and extending the duration of the dry season, making it less predictable. The paper concludes that the objective of implementing adaptation strategies is to proficiently manage the climate risks anticipated in the forthcoming decades. This can aid in informing the decisions of farmers, as well as other stakeholders, including policymakers and development partners. Some climate changes occur naturally, thus humans have limited control over them, while others result from human activities. This study, however, did not provide a link between climate change and sustainability of income generating activities.

The study conducted by Gani & Sharma (2009) revealed that there is a negative correlation between the level of greenhouse gas emissions and the start of a business. This suggests that in developing countries, the regulations are more stringent when it comes to establishing a business.

Jayant and Routray (2013) conducted a study to explore farming households' perceptions and understanding of drought, as well as their coping and adaptive strategies. The research incorporated both secondary and primary data obtained through a structured questionnaire survey. The findings suggest that farmers' views on climatic variability and drought align with secondary climatic data. Despite interpreting weather phenomena through religious beliefs, respondents acknowledged climatic and environmental factors such as rising temperatures, reduced precipitation, shifts in rainy season timing, and issues like inadequate irrigation electricity supply, groundwater over-exploitation, and population growth exacerbating drought severity in the region. Drought-induced losses in

fruit production and livestock disproportionately affecting poorer and small-scale farmers. To mitigate drought impacts, farmers employ various strategies including crop and water management practices, adjusting agricultural inputs, seeking off-farm employment, asset depletion, consumption smoothing, borrowing, and migration for alternative income sources. The study, however, did not provide specific policy intervention and practical measures to address and adapt to drought conditions.

Ezra (2001) conducted a study in drought-prone regions of northern Ethiopia, the study delved into demographic responses to environmental stress. Employing a descriptive methodology, the researcher investigated how farming households adapt to ongoing ecological degradation and food insecurity. The findings underscored the importance of supplementary income sources due to the limitations of primary economic resources like farming and livestock in sustaining farmers adequately. Accordingly, the study recommended exploring alternative income avenues such as seasonal employment in commercial farms, engaging in commercial farming, and seeking non-farm employment in urban centers to enhance income sustainability. However, the study did not demonstrate the effectiveness of alternative income sustainability.

2.3 Summary of Review of Literature and Research Gaps

This study has considered literature which has aided in conceptualizing the aspects of physical, socio-cultural, and ecological factors influencing sustainability of income generating activities of an organization. Having an in-depth understanding of this concept will help organizations to rationalize available resources to increase sustainability of income generating activities, in addition they will be able to come up with policy interventions that will drive income sustainability upwards.

This study has also reviewed similar studies carried out by other authors regarding the variables that have been evaluated. It's worthwhile to note that the discussions on the assessment of environmental factors and sustainability of income generating activities are not conclusive. In addition, most of the studies that have been reviewed in this study focused on corporates and small and medium enterprises and the variables evaluated were narrowing to physical and social cultural factors, in this study variables to be evaluated will be broader hence it seeks to bridge the existing gap.

Table 2.1: Research Gaps

Author and year	**Objective**	**Methodology**	**Findings**	**Research Gap**
Kipkoech (2018)	to establish whether financial and physical resource affects the implementation of income generation	Descriptive and inferential statistic method were employed	The findings showed that whereas financial resources were not adequate, most schools had adequate physical resources. Both types of resources were found to be independent predictors of engagement (present or future) of a	The study did not provide a distinct definition of physical resources.

			school IGA	
Shonia (2012)	Assess income generating strategies of rural women	Structured and Semi-structure interviews and other participatory tools	findings reveal that although the studied women are involved in various income-generating activities, their personal annual income from these IGAs is not substantial	The study did not provide an effective strategy for income generation and sustainability.
Odingo (2010)	The objectives of the study were to investigate the extent to which financial, social-cultural, physical, and natural factors influence sustainability of IGA among women in Nyando. The objective of the study was to	The researcher utilized a descriptive methodology aimed at soliciting the opinions and perspectives of the respondent	The findings regarding physical factors indicated that road and communication networks significantly influence income-generating*g* the findings regarding physical factors indicated that road and communication	Although the study was able to establish that the variables in the study had correlation with income generating activity, it did not correlate it with sustainability

	investigate the extent to which financial, social-cultural, physical, and natural factors influence sustainability of IGA among women in Nyando.		networks significantly influence income-generating activities (IGA), particularly concerning the marketing of produce generating activities (IGA), particularly concerning the marketing of produce	
Park and Kim (2008)	examined the impact of access to social resources on the performance of small and medium enterprises in the Republic of Korea	The study employed econometric method where binary probit regression method was utilized	The study findings revealed that access to social resources was significantly associated with higher profitability and a greater likelihood of survival for the businesses.	The study was limited because it did not in in-depth specify the elements of social resources utilized by small and medium

				enterprise
Akinbami et al. (2019)	examined past and present practices associated with climate change adaptation in two rural areas within Oyo State.	The study employed a descriptive research approach	concludes that the objective of implementing adaptation strategies is to proficiently manage the climate risks anticipated in the forthcoming decades	This study did not provide a link between climate change and sustainability of income generating activities
Jayant and Routray (2013)	to explore farming households' perceptions and understanding of drought, as well as their coping and adaptive strategies	The research incorporated both secondary and primary data obtained through a structured questionnaire survey	The findings suggest that farmers' views on climatic variability and drought align with secondary climatic data	The study did not provide specific policy intervention and practical measures to address and adapt to drought conditions
Ezra (2001).	To investigate how farming households adapt to ongoing	a descriptive methodology was	The findings underscored the importance of	The study did not demonstrate

	ecological degradation and food insecurity.	employed	supplementary income sources due to the limitations of primary economic resources like farming and livestock in sustaining farmers adequately	the effectiveness of alternative income sustainability

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This Chapter presents research design and methodology of the study which comprises of the following: Research design, target population, sample size and sampling procedures, research instruments, pilot testing, validity and reliability of instrument, data collection procedure, data analysis techniques, ethical considerations, and operationalization of variables.

3.2 Research Design

Research design is a plan that provides a framework of how the study gathers information (Sileyew, 2019). In Research design it is important to consider several factors including the specific procedures and methods applied in data collection, instrument used, organization of information and analysis (Cooper and Schindler, 2003). This study utilized a descriptive survey design to accurately portray the profile (Cooper, 1999). The strength of this design lies in its ability to offer a detailed depiction of the variable distribution without assuming causality. It was employed to describe the characteristics of a specific phenomenon within the context. This approach enabled the collection of evidence about the status of the study field, providing a thorough understanding of the population.

3.3 Research Site

The study was conducted in Kamar Pastoral field school in Mogotio ward Baringo County Kenya. The researcher chose to conduct a study on this specific pastoral field school due to the pastoralist nature of the region.

3.4 Population of the Study

Cooper and Schindler (2015) described target population as the comprehensive group encompassing all individuals under investigation, whether for real-world analysis or theoretical exploration of people, events, or phenomena that a researcher aims to generalize the findings from. The target population for this study was drawn from 600 residents of Kamar, Baringo county where Kamar Pastoral field school is situated inclusive of Kamar Pastoral Field School population. The distribution included the county agricultural and livestock extension officers, Faith based organization elders, Kamar residence and the population of Kamar pastoral field. The distribution is as shown in the table below.

Table 3.1: Target Population Distribution

Population Category	**Target Population**	**Sample Population**	**Percentage**
Kamar Pastoral Field School Members	150	72	30
Kamar Pastoral Field School Leaders	50	24	10
County Agriculture and Livestock Extension Officers	150	60	25
Community Leaders	100	60	25
Faith Based Organization Members	150	24	10
Total	**600**	**240**	**100**

Source: **(Author 2024)**

3.5 Study Sample

3.5.1 Sample size

Sampling units are defined by Cooper and Schindler (2003) as a list of sampling units. An exhaustive list of all individuals or units in a population is referred to as a sampling frame, according to Saunders (2016). Cooper & Schindler (2014) define sampling as the process of selecting elements from a population that are representative of the population. As a result, the study's sample size can be assessed to see whether it is

representative of the entire population. Random sampling will be conducted using a stratified random sampling method. Stratified random sampling divides a population into subgroups or strata, and random samples are selected from each stratum in random proportion (Mbwesa, 2006). Hence using stratified random sampling will help the researcher achieve the unit of inquiry.

When a sample is taken from a larger group, it can be used to estimate the characteristics of the group (Siegel 2003). It is a subset of a population that has been chosen so that it accurately reflects the population. Hence Yamane Taro's formula will be used to get the sample size as shown below.

$$n = \frac{N}{1 + Ne^2}$$

Where:

N = total population

n = number of samples,

e = error margin / margin of error

$$n = \frac{600}{1 + (600 * 0.05^2)}$$

n = 240

The sample size for this study will be 240.

3.5.2 Sampling Procedure

A sample is a portion that represents a whole population (Allen, 2017). In this a study a sample will be an individual whom the researcher selects for data collection purposes. Mugenda and Mugenda (2003) and Kothari (2004) alluded that a sample size of 10%-30% of the entire population is sufficient for a study. The sample of this study was

selected member of Kamar pastoral field school. The selection was carried out in such a way that the selected members were a representation of the larger group from which they were selected. Simple random sampling technique was used to select the respondents at each of the strata (Mugenda et al., 2003; Mugenda, 2011).

3.6 Data Collection

The study employed primary data which involved the use of a questionnaire.

3.6.1 Research Instruments

The data collection instruments, namely questionnaires, observations, and key informants were used to collect data. The primary and secondary data were employed complementarily to give a unique category of data for this study. Secondary was obtained from books, journals, and reports. It was used particularly to fill in the gaps in primary data as per the study themes. Primary data was as a result from a survey of 240 individuals in the study area. The questionnaire was used because it is easier for the respondent to understand given that some of the respondents may not be well educated, it also guarantees confidentiality to the respondents. In addition, questionnaires are cheap and thus economical to the researcher. In conclusion questionnaire is convenient and simple to administer hence preferable when collecting data (Kothari, 2004)

Closed questions required the respondents to choose from the options given. The objective of closed questions was to assist the respondent to make quick and accurate decisions by choosing on the provided questions. On the other hand, open ended questions were important as it allowed the respondents to answer questions that would not be possible to be captured in a closed manner, hence the two approaches were necessary in this study as they complemented each other.

3.6.2 Piloting of Research Instruments

A pilot study refers to a small-scale introductory test of study's methods and procedures which assist to modify and plan for the main research (Fraser et al., 2018).

According to Creswell (2003) research procedure is a method of collecting and analyzing data for a particular purpose. A pilot study was conducted. Pilot testing was important in ascertaining the validity and the reliability of the questionnaire. The pilot testing helped the researcher to identify errors in the questionnaire, and to identify areas where the respondent's found difficulties in answering.

The results of the pre-test survey helped in restructuring of the questionnaire by incorporating the missing information, omitting irrelevant questions, and paraphrasing questions that appeared ambiguous to the respondents.

3.6.3 Validity of the Instruments

Ensuring the validity of data collection instruments was crucial for establishing the credibility, reliability, and comprehensiveness of the research data obtained (Bashir et al., 2008). To uphold the validity of the instrument, this study carefully selected the most pertinent and suitable questions for data collection, ensuring that all aspects were exhaustively covered, and no critical elements were omitted. The validation process was conducted during the piloting phase. Additionally, the instrument underwent review and discussion with supervisors, who provided guidance on selecting appropriate indicators to measure the study variables.

3.6.4 Reliability of Instruments

Reliability refers to the assessment of credibility or consistency in the outcomes produced each time a method is employed for data collection. In this study, the reliability of the instrument was assessed using Cronbach's Alpha Coefficient, which evaluates

internal consistency. A reliability coefficient of at least 0.70 at a confidence level of α=0.05 is considered acceptable for a test to be deemed reliable (Gable and Wolf, 2003). Reliability tests were conducted to ensure the consistency of the variable constructs. Table 3.2 shows reliability statistics. A threshold of 0.7 was set for reliability.

Table 3.2: Reliability Statistics

Variables	**Cronbach's Alpha Coefficient**	**No of Items**
Physical Resources	0.856	3
Socio-Cultural Factors	0.914	4
Ecological Factors	0.922	5

The reliability results indicate that all variables surpassed the cutoff value of 0.7, suggesting that the constructs are reliable for this study.

3.7 Data Collection Procedure

Primary data for the research project was collected through the distribution of questionnaires to all sampled respondents. The questionnaires were designed to gather comprehensive data on the study's variables. To ensure clarity and consistency in responses, the questionnaires included structured questions.

3.8 Data Analysis and Presentation of Findings

Data analysis involves the procedures of cleaning, transforming, organizing, summarizing, and modeling research data collected, aiming to effectively structure, synthesize, and characterize information derived from the data collection tool (Franzosi et al., 2009). According to Mugenda and Mugenda (2003), data analysis is the process of imposing order, structure, and significance on the wealth of collected data. In this study, measures were taken to ensure that the collected data was thorough and comprehensive.

The analysis was conducted using the Statistical Package for Social Sciences (SPSS), which offers capabilities for data handling and statistical analysis, enabling the

examination of data statistics and the generation of descriptive statistics. Descriptive statistics, including means, standard deviation, and frequency distribution, were employed to analyze the data. Additionally, data presentation involved the use of tables and figures to facilitate comprehension and interpretation of the findings.

3.9 Ethical Considerations

Ethical considerations refer to the guiding principles that must be adhered to for the proper conduct of research. They involve the evaluation of acceptable and unacceptable behaviors throughout the research process (Gajjar, 2013). To conduct the study, permission was obtained from relevant authorities via a letter of authorization from Nazarene University. The researcher obtained consent from participants and maintained the highest level of confidentiality regarding their details, including names, while ensuring anonymity for those participants who did not wish to share their personal information. Participation in this process was voluntary, as the researcher did not exert any pressure on participants to divulge information.

CHAPTER FOUR: DATA PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

The chapter begins with an overview of the questionnaire response rate and the reliability of the research instruments. It then delves into the descriptive statistics and regression analyses based on the study's objectives. The chapter concludes with an interpretation and discussion of the results, comparing them with previous studies.

4.2 Questionnaire Response Rate

The study targeted a sample of 240 respondents. However, only 202 responses were received, resulting in a response rate of 84.2%. According to Mugenda and Mugenda (2003), a response rate above 70% is adequate for making interpretations about a population. Therefore, the response rate of 84.2% is considered satisfactory.

Table 4.1: Questionnaire Return Rate

Responses	**Frequency**	**Percent**
Filled Questionnaires	202	84.2
Unfilled Questionnaires	38	15.8
Total	**240**	**100**

Source: Author (2024)

Data in Table 4.1 show that the return rate was 84.2% which is above the 70% threshold for reliable survey results. The higher return percentage rate raises the level of confidence of the data accuracy reflecting the larger opinion the vast respondents.

4.3 Reliability of the Research Instrument

Reliability tests were conducted to ensure the consistency of the variable constructs. Cronbach's alpha was used to measure internal consistency, with results summarized in Table 4.2. A threshold of 0.7 was set for reliability.

Table 4.2: Reliability Statistics

Variables	Cronbach's Alpha Coefficient	No of Items
Physical Resources	0.856	3
Socio-Cultural Factors	0.914	4
Ecological Factors	0.922	5

The reliability results indicate that all variables surpassed the cutoff value of 0.7, suggesting that the constructs are reliable for this study.

4.4 Validity of the Research Instrument

The validity of the research instrument was assessed by correlating individual constructs with the total scale of the variables. Significant correlation coefficients indicate a valid tool, suggesting that the sampled data can be generalized to the broader population with a high level of confidence. The data is attached in appendix III.

4.5 Demographic Characteristics of the Respondents

This section provides a demographic overview of the respondents, highlighting their gender, level of education, position in the community, and age category.

Table 4.3: Demographic Characteristics of Respondents

Gender	Frequency	Percent	Valid Percent
Male	150	74.3	74.3
Female	52	25.7	25.7
Total	**202**	**100.0**	**100.0**

Level of Education	Frequency	Percent
Certificate	104	51.5
Diploma	51	25.2
Degree	42	20.8
Masters	4	2.0
PhD	1	0.5
Total	**202**	**100.0**

Position in the Community	Frequency	Percent

Position in the Community	Frequency	Percent
Pastoral Leader	60	29.7
Pastoral Member	70	34.7
Community Leader	29	14.4
County Government	24	11.9
Faith Based Organization	19	9.4
Total	**202**	**100.0**

Age Category	Frequency	Percent
Under 30 Years	21	10.4
31-40 Years	22	10.9
41-50 Years	16	7.4
Over 50 Years	143	70.8
Total	**202**	**100.0**

4.5.1 Gender of the Respondents

The findings of data in Table 4.3 indicates that the majority of the respondents are male, accounting for 74.3% of the total sample. Female respondents make up 25.7% of the sample. The total number of respondents is 202, with males comprising the larger proportion of the population studied. This suggests that there is a significant gender disparity in the sample, with nearly three-quarters of the participants being male. This show that males make decision in pastoral activities compared to women in Mogotio sub-county.

4.5.2 Level of Education Respondents

Results from Table 4.3 show that the majority of the respondents have a Certificate level of education, accounting for 51.5% of the total sample. This is followed by respondents with a Diploma, who make up 25.2% of the sample. Those with a Degree constitute 20.8% of the respondents. A smaller proportion of the sample has attained higher education levels, with 2.0% holding a master's degree and only 0.5% having a PhD. This distribution suggests that most participants have some form of post-secondary education,

but higher education levels (Master's and PhD) are relatively rare. The predominance of respondents with Certificate and Diploma qualifications indicates that the educational background of the sample is primarily focused on practical and vocational training.

4.5.3 Position of Community Respondents

Table 4.3 shows that the respondents hold various positions within their community, with the majority being Pastoral Members (34.7%) and Pastoral Leaders (29.7%). Community Leaders make up 14.4% of the respondents, followed by those affiliated with County Government (11.9%) and Faith Based Organizations (9.4%). This distribution indicates that the sample includes a diverse range of community roles, with a strong representation from pastoral members and leaders. This suggests that the perspectives collected are likely influenced by the roles these individuals play in the community, particularly in pastoral activities. The presence of respondents from County Government and Faith Based Organizations also adds a layer of diversity to the sample, potentially bringing in different viewpoints and experiences related to the sustainability of income-generating activities among activities of pastoral field schools in Baringo county, Kenya.

4.5.4 Age Category of Respondents

Finally, results indicate that the majority of the respondents are over 50 years old, accounting for 70.8% of the total sample. This is a significant proportion compared to other age categories. Respondents under 30 years make up 10.4% of the sample, those aged 31-40 years constitute 10.9%, and those aged 41-50 years represent 7.4% of the sample. This pattern suggests that the sample predominantly consists of older individuals, particularly those over 50 years which could demonstrate that the insights gathered are primarily from more experienced and possibly more established community members.

4.6 The Assessment of Environmental Factors and Sustainability of Income Generating Activities of Kamar Pastoral Field School

The Assessment of Environmental Factors and Sustainability of Income Generating Activities of the Pastoral Field School of Kamar Pastoral was measured by Physical Factors, Social Cultural Factors and Ecological Factors.

4.6.1 Descriptive Data on the Physical Resources Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Three-line items were responded to as indicated in table 4.6 on physical resources influence on sustainability of income generating activities of Kamar Pastoral field school

Table 4.4: Physical Resources Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Statement	Strongly Disagree f(%)	Disagree f(%)	Neutral f(%)	Agree f(%)	Strongly Agree f(%)	Mean	Std. Dev
Distance to market plays a significant role on the sustainability of income-generating activities of Kamar Pastoral Field School	18 (8.9%)	16 (7.9%)	32 (15.8%)	66 (32.7%)	70 (34.7%)	3.76	1.255
Road networks play a significant role on the sustainability of income-generating activities of Kamar Pastoral Field School	17 (8.4%)	21 (10.4%)	35 (17.3%)	67 (33.2%)	62 (30.7%)	3.67	1.247
Farm size influences the sustainability of income-generating activities of Kamar Pastoral Field School	13 (6.4%)	25 (12.4%)	22 (10.9%)	61 (30.2%)	81 (40.1%)	3.85	1.253
Composite mean and SD						**3.76**	**1.252**

***Source**: Author (2024)*

Physical factors were assessed to determine their influence on the sustainability of income-generating activities. The results are presented on Table 4.4.

Statement (1) When considering the role of the distance to market on the sustainability of income-generating activities, the responses indicate a consensus on its importance. A total of 18 respondents (8.9%) strongly disagreed, while 16 respondents (7.9%) disagreed with the statement. A neutral stance was taken by 32 respondents (15.8%). However, the majority of respondents showed agreement: 66 respondents (32.7%) agreed, and 70 respondents (34.7%) strongly agreed. The mean score for this factor is 3.76, suggesting that, on average, respondents agree that distance to market plays a significant role. The standard deviation of 1.255 reflects a moderate variation in opinions.

Statement (2) road networks are considered vital for the sustainability of income-generating activities. In this case, 17 respondents (8.4%) strongly disagreed, and 21 respondents (10.4%) disagreed. A neutral position was held by 35 respondents (17.3%). A larger segment of the respondents expressed agreement, with 67 respondents (33.2%) agreeing and 62 respondents (30.7%) strongly agreeing. The mean score of 3.67 suggests a general agreement on the significance of road networks, and the standard deviation of 1.247 indicates a moderate level of variability in the responses.

Statement (3) the influence of farm size on the sustainability of income-generating activities was also assessed. Here, 13 respondents (6.4%) strongly disagreed, and 25 respondents (12.4%) disagreed. The neutral category included 22 respondents (10.9%). Notably, a substantial majority agreed, with 61 respondents (30.2%) and 81 respondents (40.1%) strongly agreeing that farm size influences sustainability. The mean score of 3.85 is the highest among the three factors, indicating a stronger agreement with this statement. The standard deviation of 1.253, like the other factors, denotes a moderate variation in opinions.

4.6.2 Inferential Statistic for Physical Resources Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field

4.6.2.1 Hypothesis Testing:

Correlation, regression and hypothesis testing were conducted to test relationship between Physical Resources influence on sustainability of income generating activities of Kamar Pastoral Field school was computed by means of Pearson`s correlational analyses.

H01: There is no significant relationship between physical resources and sustainability of income generating activities of Kamar Pastoral field Baringo County.

Table 4.5: Statistical Outputs for Physical Resources Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Variable	**Statistics**	**Sustainability of income generating Activities of Kamar Pastoral Field School**
Physical Resources	Pearson Correlation	.903**
	Sig.(2-**tailed)**	.000
	N	202

Correlation is significant at the 1 percent level (2-tailed).

As indicated in Table 4.5, analysis revealed a strong positive correlation between Physical resources and sustainability of income generating activities of Kamar Pastoral Field School, $r = 0.903$, $p < 0.01$), indicating that as physical resources improve, the sustainability of IGAs increases.

The Chi-square test shows that there is no sufficient evidence to support the above hypothesis. as shown by the Pearson Chi-Square at 1% significance level. Therefore, the null hypothesis was rejected on the account of the Pearson Chi-Square critical value (0.00) being less than the p-value (0.01) at 1% significance level.

4.6.3 Regression of Physical Resources Influence on Sustainability of Income Generating Activities of Kamar Pastoral Field

Ordinary Least Square (OLS) was employed to assess the influence of physical resources on the sustainability of income-generating activities. The hypothesis was assessed using P values (Significance or Sig.), which facilitated the decision to either accept or reject the hypothesis. Standardized coefficients were employed to interpret the beta value. The objective of the study was to evaluate the alternative hypothesis, which suggests that physical resources significantly impact income generating activities of Pastoral Field Schools; Baringo County. To determine statistical significance, the calculated p-value was compared against a threshold of 0.05.

Table 4.6: Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0	1	.903[a]	.816	.815	.465

a. Predictors: (Constant), Physical factors

The model summary indicates a strong relationship between physical factors and the sustainability of income-generating activities of pastoral field schools. The correlation coefficient (R) is 0.903, suggesting a very strong positive correlation. The R Square value of 0.816 implies that 81.6% of the variability in sustainability can be explained by physical factors. After adjusting for the number of predictors in the model, the Adjusted R Square remains high at 0.815, indicating that the model retains its explanatory power. The standard error of the estimate is 0.465, which measures the average distance that the observed values fall from the regression line.

Table 4.7: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	192.315	1	192.315	888.452	.000[a]
	Residual	43.292	200	.216		

Total	235.608	201

a. Predictors: (Constant), Physical factors
b. Dependent Variable: Sustainability of income generating activities of pastoral field schools

The ANOVA table shows that the model is statistically significant. The regression sum of squares is 192.315, indicating the amount of variation explained by the model. The residual sum of squares is 43.292, representing the variation not explained by the model. The total sum of squares is 235.608, which is the total variation in the dataset. The F-statistic is 888.452, which is very high and indicates that the model is a good fit for the data. The significance level (Sig.) is 0.000, which is less than 0.05, confirming that the model is statistically significant and that physical factors significantly predict the sustainability of income-generating activities, therefore the null hypothesis was rejected.

Table 4.8: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.435	.118		3.673	.000
	Physical factors	.898	.030	.903	29.807	.000

a. Dependent Variable: Sustainability of income generating activities of pastoral field schools

The coefficients table provides detailed insights into the relationship between physical factors and sustainability. The constant (intercept) is 0.435, which is the expected value of the dependent variable when all predictors are zero. The unstandardized coefficient for physical factors is 0.898, meaning that for every one-unit increase in physical factors, the sustainability of income-generating activities increases by 0.898 units. The standardized coefficient (Beta) is 0.903, showing a strong positive effect of physical factors on sustainability. The t-value for physical factors is 29.807, and the significance level (Sig.) is 0.000, indicating that the coefficient is statistically significant and that physical factors are a significant predictor of the sustainability of income-generating activities.

4.6.4 Qualitative Data on the Influence of Physical Resources on the Sustainability of Income-Generating Activities of Pastoral Field Schools

When the statements made in the interview guide responses were analyzed, it was discovered that physical resources significantly influence the sustainability of income-generating activities in pastoral field schools. This was the response from a member of Kamar Pastoral Field:

"My experience with income-generating activities at the pastoral field school has been quite positive. Being close to the market means we can sell our produce quickly and at better prices. The training and support we receive at the field school have been instrumental in enhancing our skills and knowledge."

"Good road networks reduce transportation costs and time, making it easier to access necessary supplies and services."

"Having a larger farm allows for more production, which directly impacts our income levels."

4.6.5 Physical Resources and Sustainability of IGAs of Kamar Pastoral Field School

The coefficient for Physical Factors ($\beta_3 = 0.898$, $p < 0.001$) signifies that a one-unit increase in physical resources leads to a 0.898 increase in sustainability. This shows that physical resources, such as market accessibility, road networks, and farm size, significantly influence the sustainability of IGAs. According to Nyangito (2010), accessibility to markets and good infrastructure are critical for the success of agricultural enterprises in Kenya. This aligns with the findings, emphasizing that well-developed road networks and proximity to markets reduce transaction costs and enhance market participation for pastoralists. Similarly, a study by Wiggins and Keats (2014) supports the

importance of farm size, noting that larger farm sizes often correlate with higher productivity and sustainability due to economies of scale and better resource management.

4.7 Socio-Cultural Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Socio-cultural factors influence on the sustainability of income generating activities of Kamar pastoral field was measured using the level of education, Age, Religion and Agricultural Extension.

4.7.1 Descriptive Data on Socio-Cultural Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Four items were responded to as indicated in Table 4.9 on Socio-Cultural Factors influence on the sustainability of income generating activities of Kamar pastoral field.

Table 4.9: Socio-Cultural Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Statement	**Strongly Disagree** *f(%)*	**Disagree** *f(%)*	**Neutral** *f(%)*	**Agree** *f(%)*	**Strongly Agree** *f(%)*	**Mean**	**Std.**
1. Level of education plays a significant role on the sustainability of income-generating activities of Kamar Pastoral Field School	16 (7.9%)	20 (9.9%)	25 (12.3%)	72 (35.6%)	69 (34.1%)	**3.78**	**1.239**
2. Religion influences sustainability of income-generating activities of Kamar Pastoral Field School	17 (8.4%)	19 (9.4%)	21 (10.3%)	68 (33.6%)	77 (38.1%)	**3.84**	**1.265**
3. Agriculture extension influences the sustainability of income-generating activities of Kamar Pastoral Field School	17 (8.4%)	17 (8.4%)	20 (9.9%)	78 (38.6%)	70 (34.6%)	**3.83**	**1.232**
4. Age plays a significant role on the sustainability of income-generating activities of Kamar Pastoral Field School	17 (8.4%)	20 (9.9%)	20 (9.9%)	68 (33.6%)	77 (38.1%)	**3.83**	**1.270**

Statement	Strongly Disagree *f(%)*	Disagree *f(%)*	Neutral *f(%)*	Agree *f(%)*	Strongly Agree *f(%)*	Mean	Std.
Composite mean and SD						**3.82**	**1.2515**

***Source**: Author (2024)*

Statement (1) the role of education in sustaining income-generating activities at Kamar Pastoral Field School is seen as significant by most respondents. While a minority strongly disagrees (7.9%) or disagrees (9.9%), a total of 17.8% of respondents do not view education as a key factor. Another 12.3% remain neutral on the issue. However, a substantial majority, 35.6% and 34.1%, agree and strongly agree respectively, indicating a strong belief in the importance of education for sustainability. The mean score of 3.78 reflects this general agreement, with a standard deviation of 1.239 suggesting moderate variability in responses.

Statement (2) Religion is also perceived as an influential factor in the sustainability of income-generating activities. A total of 17.8% of respondents either strongly disagree (8.4%) or disagree (9.4%) that religion plays a significant role. Meanwhile, 10.3% remain neutral. Nonetheless, the majority agrees (33.6%) or strongly agrees (38.1%), highlighting the perceived importance of religion. The mean score of 3.84 indicates a general agreement with this sentiment, and the standard deviation of 1.265 shows moderate variability in opinions.

Statement (3) Agriculture extension services are widely seen as important for sustainability. Only 8.4% of respondents strongly disagree and an equal percentage disagree, amounting to a total of 16.8% who do not see these services as crucial. About 9.9% are neutral on this matter. However, a significant portion agrees (38.6%) or strongly agrees (34.6%), pointing to the perceived critical role of agriculture extension. The mean

score of 3.83 suggests a broad agreement, with a standard deviation of 1.232 indicating the lowest variability among the factors considered.

Statement (4), Age is considered an important factor by the majority of respondents. While 8.4% strongly disagree and 9.9% disagree, together making up 18.3% of respondents who do not see age as a significant factor, an equal percentage (9.9%) remain neutral. A large portion of respondents agree (33.6%) or strongly agrees (38.1%) that age influences the sustainability of income-generating activities. The mean score of 3.83 signifies a general agreement, with a standard deviation of 1.270 showing the highest variability among the factors.

4.7.2 Inferential Statistic for Social-Cultural influences on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

4.7.2.1 Hypothesis Testing

H02: There is no significant relationship between Socio cultural factors and sustainability of income generating activities of Kamar Pastoral field Baringo County.

Correlation between Social -cultural influence on sustainability of income generating activities of Kamar Pastoral Field school was computed by means of Pearson`s correlational analyses.

Table 4.10: Statistical Outputs for Cultural-Cultural Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Variable	**Statistics**	**Sustainability of income generating Activities of Kamar Pastoral Field School**
Social-Cultural	Pearson Correlation	.899**
	Sig.(2-**tailed)**	.000
	N	202

Correlation is significant at the 1% level (2-tailed).

As indicated in Table 4.10, analysis revealed a strong positive correlation between the Social Cultural factors and sustainability of income generating activities of Kamar

Pastoral Field School (r = 0.899, p < 0.01), indicating that as socio-cultural factors improve, the sustainability of IGAs increases.

The Chi-square test shows that there is no sufficient evidence to support the above hypothesis as shown by the Pearson Chi-Square at 1% significance level. Therefore, the null hypothesis was rejected on the account of the Pearson Chi-Square critical value statistic (0.000) being less than the p-value (0.01)

4.7.3 Regression of Social-Cultural Influence on Sustainability of Income Generating Activities of Kamar Pastoral Field School

Regression analysis was obtained for socio-cultural factors where it was regressed against sustainability of the income generating activities of Pastoral Field Schools. The conventional P-value of 0.05 or 5 percent was used in decision criteria of rejecting or accepting the null hypothesis.

Table 4.11: Model Summary for Socio-Cultural Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0 1	.899[a]	.808	.807	.476

a. Predictors: (Constant), Socio cultural factors

The model summary illustrates the relationship between socio-cultural factors and the sustainability of income-generating activities in pastoral field schools. The correlation coefficient (R) is 0.899, indicating a strong positive relationship. The R Square value is 0.808, meaning that 80.8% of the variability in sustainability can be explained by socio-cultural factors. The Adjusted R Square is 0.807, which remains very close to the R Square, showing that the model's explanatory power is robust even after adjusting for the number of predictors. The standard error of the estimate is 0.476, reflecting the average distance that the observed values fall from the regression line.

Table 4.12: ANOVA table for Socio-Cultural Factors

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190.387	1	190.387	842.027	.000[a]
	Residual	45.221	200	.226		
	Total	235.608	201			

a. Predictors: (Constant), Socio cultural factors
b. Dependent Variable: Sustainability of income generating activities of pastoral field schools

The ANOVA table demonstrates the overall significance of the regression model. The regression sum of squares is 190.387, indicating the variation explained by the model. The residual sum of squares is 45.221, representing the variation not explained by the model. The total sum of squares is 235.608, which is the total variation in the dataset. The F-statistic is 842.027, a very high value, indicating that the model is statistically significant. The significance level (Sig.) is 0.000, well below the 0.05 threshold, confirming that the model significantly predicts the dependent variable (sustainability of income-generating activities).

Table 4.13: Coefficients Table for Socio-Cultural Factors

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.549	.118		4.652	.000
	Socio cultural factors	.863	.030	.899	29.018	.000

a. Dependent Variable: Sustainability of income generating activities of pastoral field schools.

The coefficients table provides detailed information about the impact of socio-cultural factors on sustainability. The constant (intercept) is 0.549, which is the expected value of the dependent variable when all predictors are zero. The unstandardized coefficient for socio-cultural factors is 0.863, meaning that for every one-unit increase in socio-cultural factors, the sustainability of income-generating activities increases by 0.863 units. The standardized coefficient (Beta) is 0.899, showing a strong positive effect of socio-cultural

factors on sustainability. The t-value for socio-cultural factors is 29.018, and the significance level (Sig.) is 0.000, indicating that the coefficient is statistically significant and that socio-cultural factors are a significant predictor of the sustainability of income-generating activities. Therefore, the null hypothesis was rejected.

4.7.4 Qualitative Data on the Influence of Socio-Cultural Factors on the Sustainability of Income-Generating Activities of Pastoral Field Schools

Analyzing the interview responses revealed that socio-cultural factors play a crucial role in the sustainability of income-generating activities. The qualitative responses are summarized below: This is what they had to say.

"*The agricultural extension officers visit us regularly, providing us with the latest information on best practices, disease control, and sustainable farming techniques. This support has been crucial in improving our productivity and ensuring the sustainability of our activities."*

"*Education helps us adopt new technologies and improve our farming practices"*

"*Religion often shapes our community interactions and decisions, promoting ethical and sustainable practices."*

"Age influences the sustainability of income-generating activities. Older members of the community often have more experience and knowledge, which they pass on to the younger generation."

4.7.5 Socio-Cultural Factors and Sustainability of IGAs of Pastoral Field Schools

The coefficient for socio-cultural factors ($\beta_1 = 0.863$, $p < 0.01$) indicates that a one-unit increase in socio-cultural factors is associated with a 0.863 increase in the sustainability of IGAs, holding other factors constant. These findings are consistent with the works of Muthoni and Mukiri (2014) who discuss the critical role of education in empowering

pastoral communities by improving their ability to adopt new technologies and sustainable practices. This supports the study's finding that higher education levels positively impact sustainability. Kratli and Dyer (2009), emphasized the significant role played by religion on sustainability. They avert that religious beliefs can shape attitudes towards resource use and conservation practices in pastoral communities. Similarly, Anderson and Feder (2004) emphasized that access to extension services enhances farmers' knowledge and skills, leading to improved productivity and sustainability of their activities. This corroborates the study's finding of the importance of agricultural support on sustaining IGAs.

4.8 Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Ecological factors influence on the sustainability of income generating activities of Kamar pastoral field was measured using the following indicators, topology, season and climate

4.8.1 Descriptive Data on Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Three items were responded to as indicated in Table 4.14. Ecological Factors influence on the sustainability of income generating activities of Kamar pastoral field

Table 4.14: Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Statement	Strongly Disagree *f (%)*	Disagree *f (%)*	Neutral *f (%)*	Agree *f (%)*	Strongly Agree *f (%)*	Mean	Std. Dev
1. Seasonality plays a significant role on the sustainability of income-generating activities of Kamar Pastoral Field School	18 (8.9%)	19 (9.4) %	32 (15.8%)	64 (31.6%)	69 (34.1%)	**3.73**	**1.270**
2. Climate change influences	19	17	20	70	76	**3.83**	**1.279**

Statement	Strongly Disagree *f (%)*	Disagree *f (%)*	Neutral *f (%)*	Agree *f (%)*	Strongly Agree *f (%)*	Mean	Std. Dev
sustainability of income-generating activities of Kamar Pastoral Field School	(9.4%)	(8.4%)	(9.9%)	(34.6%)	(37.6%)		
3. Topography plays a significant role on the sustainability of income-generating activities of Kamar Pastoral Field School	14 (6.9%)	22 (10.8%)	26 (12.8%)	67 (33.1%)	73 (36.1%)	**3.81**	**1.233**
Composite mean and SD						**3.79**	**1.2607**

Statement (1) Seasonality is considered by many respondents as an important factor for the sustainability of income-generating activities at Kamar Pastoral Field School. A minority strongly disagrees (8.9%) or disagrees (9.4%), while a slightly larger segment is neutral (15.8%). However, a significant portion of respondents either agree (31.6%) or strongly agree (34.1%), highlighting the perceived importance of seasonality. The mean score of 3.73 indicates a general agreement, and the standard deviation of 1.270 reflects moderate variability in responses.

Statement (2), Climate change is perceived as a crucial factor influencing the sustainability of income-generating activities. A minority strongly disagrees (9.4%) or disagrees (8.4%), with 9.9% remaining neutral. However, a substantial majority of respondents either agree (34.6%) or strongly agree (37.6%) that climate change plays a significant role. The mean score of 3.83 suggests a strong agreement, with a standard deviation of 1.279 indicating moderate variability in opinions.

Statement (3), Topography is also seen as a significant factor for the sustainability of income-generating activities. Only a small percentage strongly disagree (6.9%) or disagree (10.8%), while 12.8% of respondents are neutral. A majority of respondents agree (33.1%) or strongly agrees (36.1%) that topography plays a significant role. The

mean score of 3.81 indicates general agreement, and the standard deviation of 1.233 reflects moderate variability in responses.

4.8.2 Inferential Statistic for Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

4.8.2.1 Hypothesis Testing

H03: There is no significant relationship between ecological resources and sustainability of income generating activities of Kamar Pastoral field Baringo County.

Correlation between Ecological factors influence on sustainability of income generating activities of Kamar Pastoral Field school was computed by means of Pearson`s correlational analyses.

Table 4.15: Statistical Output for Ecological Factors Influence on the Sustainability of Income Generating Activities of Kamar Pastoral Field School

Variable	**Statistics**	**Sustainability of income generating Activities of Kamar Pastoral Field School**
Ecological Factors	Pearson Correlation	.920**
	Sig.(2-**tailed)**	.000
	N	202

Correlation is significant at the 1% level (2-tailed).

As indicated in Table 4.15 analysis revealed a strong positive correlation between Ecological factors and sustainability of income generating activities of Kamar Pastoral Field School ($r = 0.920$, $p < 0.01$), indicating that as ecological factors improve, the sustainability of IGAs increases.

The Chi-square test shows that there is no sufficient evidence to support the above hypothesis as shown by the Pearson Chi-Square at 1% significance level. Therefore, the null hypothesis was rejected on account of the Pearson Chi-Square critical value statistic (0.000) being less than the p-value (0.01).

4.8.3 Regression of Ecological Influence on Sustainability of Income Generating Activities of Kamar Pastoral Field Schools

Regression analysis was used to determine the impact of ecological factors on sustainability of the income generating activities of Pastoral Field Schools.

Table 4.16: Model Summary for Ecological Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0 1	.920[a]	.846	.845	.426

a. Predictors: (Constant), Ecological factors

The model summary provides an overview of the relationship between ecological factors and the sustainability of income-generating activities in pastoral field schools. The correlation coefficient (R) is 0.920, indicating a very strong positive relationship. The R Square value is 0.846, which means that 84.6% of the variability in sustainability can be explained by ecological factors. The Adjusted R Square is 0.845, showing that the model's explanatory power remains very high even after adjusting for the number of predictors. The standard error of the estimate is 0.426, indicating the average distance that the observed values fall from the regression line.

Table 4.17: ANOVA for Ecological Factors

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	199.293	1	199.293	1097.578	.000[a]
	Residual	36.315	200	.182		
	Total	235.608	201			

a. Predictors: (Constant), Ecological factors

b. Dependent Variable: Sustainability of income generating activities of pastoral field schools

The ANOVA table demonstrates the overall significance of the regression model. The regression sum of squares is 199.293, indicating the amount of variation explained by the model. The residual sum of squares is 36.315, representing the variation not explained by the model. The total sum of squares is 235.608, which is the total variation in the dataset.

The F-statistic is 1097.578, a very high value, indicating that the model is highly statistically significant. The significance level (Sig.) is 0.000, well below the 0.05 threshold, confirming that the model significantly predicts the dependent variable (sustainability of income-generating activities).

Table 4.18: Coefficients for Ecological Factors

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.417	.107		3.888	.000
	Ecological factors	.900	.027	.920	33.130	.000

a. Dependent Variable: Sustainability of income generating activities of pastoral field schools

The coefficients table provides detailed information about the impact of ecological factors on sustainability. The constant (intercept) is 0.417, which is the expected value of the dependent variable when all predictors are zero. The unstandardized coefficient for ecological factors is 0.900, meaning that for every one-unit increase in ecological factors, the sustainability of income-generating activities increases by 0.900 units. The standardized coefficient (Beta) is 0.920, showing a very strong positive effect of ecological factors on sustainability. The t-value for ecological factors is 33.130, and the significance level (Sig.) is 0.000, indicating that the coefficient is statistically significant and that ecological factors are a significant predictor of the sustainability of income-generating activities.

4.8.4 Qualitative Data on the Influence of Ecological Factors on the Sustainability of Income-Generating Activities of Pastoral Field Schools

The interview responses also highlighted the significant impact of ecological factors on sustainability. The qualitative responses are summarized below:

"Seasonality affects the availability of resources, which can impact our farming cycles."

"Climate change poses challenges such as unpredictable weather patterns and extreme conditions, making it difficult to plan and sustain our activities."

"Topography influences the type of farming we can do and the accessibility of water and grazing lands."

4.8.5 Ecological Factors and Sustainability of IGAs of Kamar Pastoral Field School

The coefficient for Ecological Factors ($\beta_2 = 0.900$, $p < 0.01$) shows the strongest impact, suggesting that a one-unit increase in ecological factors results in a 0.900 increase in sustainability. These findings reveal that Ecological factors, such as seasonality, climate change, and topography, were found to have the most significant impact on the sustainability of IGAs. According to Thornton et al. (2009), climate variability and change are critical challenges for pastoral communities in Kenya, affecting water availability, pasture, and overall productivity. This aligns with the study's finding that climate change significantly impacts the sustainability of IGAs. Seasonality's role is supported by research from Ellis and Swift (1988), who found that seasonal variations in rainfall and temperature affect pastoralists' resource availability and livelihood strategies. Finally, the importance of topography is consistent with studies by Galvin et al. (2001), which indicate that the physical landscape influences access to grazing areas and water resources, directly affecting the sustainability of pastoral activities.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the findings from the study. It includes conclusions drawn from the analysis and offers recommendations based on the study's objectives. Additionally, it suggests areas for further research to expand the understanding of factors influencing the sustainability of income-generating activities in pastoral communities.

5.2 Summary of Findings

Discussions

Gender, level of education, position in the community and age category have important influence on sustainability of income generating activities. This study emphasizes that gender equity and age diversity are crucial for the success of decision making in sustainability of income generating activities in Kamar Pastoral Field School. Decision-making processes that involve both genders tend to be more inclusive and holistic, considering a wider range of factors and potential impacts. However, the study did not demonstrate a balanced representation of male and female in the Membership of Kamar pastoral field School therefore there was no sign of equitable involvement. Gender imbalances can affect the economic outcomes of sustainability initiatives. Women’s involvement in economic activities has been shown to positively impact household and community welfare. Additionally, the age diversity among Kamar members was pivotal for the sustainability IGA, further the majority of 50 years and

above demonstrated that the insights gathered were primarily from more experienced and possibly more established community members.

5.2.1 To Assess How Physical Resources Influence the Sustainability of Income Generating Activities of Pastoral Field Schools; Baringo County

The finding of the first objective revealed that physical resources, such as market accessibility, road networks, and farm size, significantly influence the sustainability of IGAs. According to Nyangito (2010), accessibility to markets and good infrastructure are critical for the success of agricultural enterprises in Kenya. This aligns with the findings, emphasizing that well-developed road networks and proximity to markets reduce transaction costs and enhance market participation for pastoralists. Similarly, a study by Wiggins and Keats (2014) supports the importance of farm size, noting that larger farm sizes often correlate with higher productivity and sustainability due to economies of scale and better resource management.

5.2.2 To Establish How Socio-Cultural Factors Influence Sustainability of Income Generating Activities of Pastoral Field Schools; Baringo County

The finding of second objective revealed that Socio-cultural factors significantly influence the sustainability of income-generating activities (IGAs). Education emerged as crucial, with higher education levels among community members leading to better adoption of sustainable practices. Religious beliefs and practices also played a substantial role, affecting community attitudes toward resource use and conservation. These findings are consistent with the works of Muthoni and Mukiri (2014) who discuss the critical role of education in empowering pastoral communities by improving their ability to adopt new technologies and sustainable practices. This supports the study's finding that higher education levels positively impact sustainability. Kratli and Dyer (2009), emphasized the

significant role played by religion on sustainability. They avert that religious beliefs can shape attitudes towards resource use and conservation practices in pastoral communities. Similarly, Anderson and Feder (2004) emphasized that access to extension services enhances farmers' knowledge and skills, leading to improved productivity and sustainability of their activities. This corroborates the study's finding of the importance of agricultural support on sustaining IGAs.

5.2.3 To Determine How Ecological Factors Influence Sustainability of Income Generating Activities of Pastoral Field Schools; Baringo County

Objective three findings revealed that Ecological factors, such as seasonality, climate change, and topography, were found to have the most significant impact on the sustainability of IGAs. According to Thornton et al. (2009), climate variability and change are critical challenges for pastoral communities in Kenya, affecting water availability, pasture, and overall productivity. This aligns with the study's finding that climate change significantly impacts the sustainability of IGAs. Seasonality's role is supported by research from Ellis and Swift (1988), who found that seasonal variations in rainfall and temperature affect pastoralists' resource availability and livelihood strategies. Finally, the importance of topography is consistent with studies by Galvin et al. (2001), which indicate that the physical landscape influences access to grazing areas and water resources, directly affecting the sustainability of pastoral activities.

5.3 Conclusions

The study emphasizes that physical, socio-cultural, and ecological factors collectively determine the sustainability of income-generating activities (IGAs) in pastoral communities. Physical resources such as improved market access and better road

networks facilitate easier product sales and reduce transportation costs, thereby ensuring steady incomes for pastoralists. Additionally, larger farm sizes enable economies of scale, boosting productivity and sustainability. Socio-cultural factors such as education, religion, agricultural extension services, and age influence sustainable practices and community attitudes toward resource management. Education equips pastoralists with essential skills, while religious beliefs often promote conservation. Agricultural extension services offer crucial guidance, and the experience of older community members contributes valuable knowledge. Ecological factors including seasonality, climate change, and topography profoundly impact resource availability and resilience. Seasonal variations affect water and pasture availability, climate change introduces new challenges, and topography shapes access to critical resources. Together, these factors shape the environment in which pastoralists operate, crucially influencing their ability to sustain IGAs and adapt to environmental changes.

5.4 Recommendations

Based on the study's findings, several key recommendations are proposed to enhance the sustainability of income-generating activities in pastoral communities.

5.4.1 Practical Actions

Firstly, infrastructure development is crucial. Improving road networks and market accessibility will reduce transaction costs and facilitate better market participation for pastoralists. This can help ensure that pastoral products reach broader markets more efficiently, boosting incomes and sustainability. Secondly, investing in educational programs and agricultural extension services is essential. These programs can empower pastoral communities with the necessary knowledge and skills for sustainable practices. Education and extension services provide vital information on best practices, new

technologies, and sustainable resource management techniques, which are critical for long-term sustainability.

Further, climate adaptation strategies should be developed and implemented. These strategies can help mitigate the impacts of climate change on pastoral livelihoods. By preparing for and adapting to changing climate conditions, pastoralists can maintain their productivity and resilience in the face of environmental challenges.in addition to this, community engagement is important. Sustainability initiatives should recognize and integrate socio-cultural dynamics, such as religion and traditional knowledge. Understanding and incorporating these factors can ensure that sustainability efforts are culturally appropriate and widely accepted within the community.

5.4.2 Policy Action

There should be support for the expansion of farm sizes. Encouraging policies and practices that allow for larger farm sizes can help pastoralists take advantage of economies of scale, improving resource management and overall productivity. Larger farms can support more sustainable and efficient operations, contributing to the long-term viability of pastoral income-generating activities.

5.5 Suggested Areas of Further Studies

To deepen the understanding of factors influencing the sustainability of income-generating activities (IGAs) in pastoral communities, several areas warrant further research. First, exploring the impact of gender roles and dynamics on the sustainability of IGAs is crucial. This research should particularly focus on the involvement of women. Understanding how gender influences decision-making, resource access, and participation in IGAs can provide insights into promoting greater gender equity and enhancing the sustainability of these activities.

Second, conducting longitudinal studies on climate change is essential. These studies would assess the long-term impacts of climate change on pastoral livelihoods and IGAs. By tracking changes over time, researchers can identify trends, challenges, and adaptive strategies, providing a clearer picture of how climate change affects pastoral communities and their income-generating activities.

Finally, there is a need to carry out a comparison of the sustainability of IGAs in different geographical locations, possibly a non-arid and semi-arid location. This can result in different outcomes; help identify best practices and common challenges. Such studies would highlight successful strategies and areas needing improvement, offering a broader perspective on how different communities manage their IGAs and what factors contribute to their success or difficulties.

REFERENCES

Amwata, D.A., D.M. Nyariki, and N.R.K. Musimba. 2015. Factors influencing agropastoral and pastoral households' vulnerability to food insecurity in the drylands of Kenya: A case study of Kajiado and Makueni Counties. Journal of International Development. https://doi.org/10.1002/jid.3123.

Barrett, C. B., Reardon, T. and Webb, P. 2001. Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and pol-icy implications. In: *Food Policy* 26 (2001): 315-331.

Bashir, M., Afzal, M. T., & Azeem, M. (2008). Reliability and validity of qualitative and operational research paradigm. Pakistan journal of statistics and operation research, 35-45.

Bocchi, S., Christiansen, S., Oweis, T., Porro, A., & Sala, S. (2012). Research for the innovation of the agri-food system in international cooperation. Italian Journal of Agronomy, 7(3), e36-e36.

Braun, A., Jiggins, J., Röling, N., van den Berg, H., & Snijders, P. (2006). A global survey and review of farmer field school experiences. *A Report for the International Livestock Research Institute, Wageningen*.

Brown, J. A., Larson, K. L., Lerman, S. B., Childers, D. L., Andrade, R., Bateman, H. L., Hall, S. J., Warren, P. S., & York, A. M. (2020). Influences of environmental and social factors on perceived bio-cultural services and disservices. *Frontiers in Ecology and Evolution, 8*, 569730. https://doi.org/10.3389/fevo.2020.56973

Coleman, J. S. (2000). Social capital in the creation of human capital. In Knowledge and social capital (pp.17-41).

Cooper, R. & Schindler, P.S. (2014). *Business Research Methods*. 8th Edition, McGraw-Hill Irwin, Boston

Heeley, M. B., King, D. R., & Covin, J. G. (2006). Effects of firm R&D investment and environment on acquisition likelihood. *Journal of Management Studies, 43*(1), 1513-1535.

Höggel, U., & Mbeyale, G. (2014). Impact Assessment of Pastoralist Field Schools in Ethiopia, Kenya, and Uganda.

Franzosi, R. P., Hardy, M., & Bryman, A. (2009). The handbook of data analysis.

Fraser, J., Fahlman, D. W., Arscott, J., & Guillot, I. (2018). Pilot testing for feasibility in a study of student retention and attrition in online undergraduate programs. The International Review of Research in Open and Distributed Learning, 19(1).

Gajjar, D. (2013). Ethical consideration in research. Education, 2(7), 8-15.

Gulati, R., & Sytch, M. (2007). Dependence asymmetry and joint dependence in inter-organizational relationships. *Administrative Science Quarterly, 52*(1), 32-69.

Jenet, A., Obala, E., & Lorika, Y. "Biophysical and Socio-economic Frame Conditions for the Sustainable Management of Natural Resources" Pastoral Field Schools a New Approach for Arid Lands in East Africa?

Jolliffe, D. 1998. Skills, schooling, and household income in Ghana. In: *The World Bank economic review* 12 (1): 81-104.

Karaimu, P. 2013. Making visible the 'invisible benefits' of African pastoralism will spur national and pastoral economies both. https://clippings.ilri.org/2013/06/24/making-visible-the-invisible—benefits-of-african-downloaded. 10 Nov 2018.

Kothari, C. R. (2008). Research Methodology: Methods and Techniques. (2nd Ed), Nairobi, Kenya: New Age International Publishers.

Maletič D, Maletič M, Al-Najjar B, Gomišček B. An Analysis of Physical Asset Management Core Practices and Their Influence on Operational Performance. *Sustainability*. 2020; 12(21):9097. https://doi.org/10.3390/su12219097

Meek, W.R., Pacheco, D.F. & York, J.G. (2010) "The Impact of Social Norms on Entrepreneurial Action: Evidence from the Environmental Entrepreneurship Context." Journal of Business Venturing, 25(5): 493-509.

Muhammed, J., Khan, A.S & Farah, A. (2006). Impact of Micro Credit Scheme of NRSP on the Socio-Economic conditions of Female community in District Rawalakot, Azad, Jumu and Kashmir, Pakistan. *Journa*l *of Agriculture and Social sciences*.2(3), 142-144

Mugenda, O. M. &Mugenda, A. G. (2003). *Research Methods: Quantitative and Qualitative Approaches.* Acts Press. Nairobi, Kenya

Mwada,M., Fatsuma, A. and shettima, B (2015) "Review of Farmer Field Schools Approach to Extention Service Deliver: Utilization and Impact in Nigeria".

Narayan, D. (2002) Empowerment and Poverty Reduction: A Sourcebook (Washington, DC: World Bank)

Nuryani, N., Satrawan, D., Gorda, A., & Martini, L. (2018). Influence of human capital, social capital, economic capital towards financial performance & corporate social responsibility. International Journal of Social Sciences and Humanities (IJSSH), 2(2), 65-76. doi:10.29332/ijssh. v2n2.128

O'Neill G.D. Jr., Hershauer, J.C. & Golden, J.S. (2009) "The Cultural Context of Sustainability Entrepreneurship." Green Management International, 55: 33-46.

Pfeffer, J. (1987). A resource dependence perspective on inter-organizational relations. In M. S. Mizruchi, & M. Schwartz (Eds.), *Intercorporate relations: The structural analysis of business* (pp. 22-55). Cambridge, UK: Cambridge University Press.

Pfeffer, J., & Salancik, G. R. (1978). The external control of organizations: A resource dependence perspective. New York: Harper and Row.

Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1993). Making democracy work: Civic institutions in modern Italy

Simpson, B. M., & Owens, M. (2002). Farmer field schools and the future of agricultural extension in Africa. Journal of International Agricultural and Extension Education, 9(2), 29-36.

Sileyew, K. J. (2019). Research design and methodology. In Cyberspace. Intech Open

Stefan Schwarze (2004) Determinants of Income Generating Activities of Rural Households: Quantitative Study in the Vicinity of the Lore-Lindu National Park in Central Sulawesi/Indonesia

Shivani, S., Mukherjee, S.K. & Sharan, R. (2006) "Socio-cultural Influences on Indian Entrepreneurs: The Need for Appropriate Structural Interventions." Journal of Asian Economics, 17(2006): 5-13.

Thornton, P.H., Ribeiro-Soriano, D. & Urbano, D. (2011) "Socio-cultural Factors and Entrepreneurial Activity: An Overview." International Small Business Journal, 29(2): 105-118.

Van den Berg, H., & Jiggins, J. (2007). Investing in farmers—the impacts of farmer field schools in relation to integrated pest management. World development, 35(4), 663-686.

Waddington, H., and W. Howard, (2014). FFS: from Agricultural extension to Adult Education.

World Bank, (2010)." A New Database on Financial Development and Structure." Washington DC: World Bank.

World Bank (2000) World Development Report 2000/2001: Attacking Poverty (Oxford University Press, World Bank)

Yunez-Naude, A. and Taylor, J. E. 2001. The Determinants of Nonfarm Activities and Incomes of Rural Households in Mexico, with Emphasis on Education. In: *World Development* 29 (3): 561-572.

APPENDICES

Appendix I: Questionnaire to be issued to Kamar Pastoral Field School Leaders, Members, County Government Employees, Community Elders and Faith Based Organizations.

Introduction

The purpose of this questionnaire is to assess Environmental Factors and Sustainability of Kamar Pastoral Field School in Emining Ward, Baringo County Kenya. This questionnaire will be issued to Kamar Pastoral Field School Leaders, Members, County Government Employees, Community Elders and Faith Based Organizations. The information that will be gathered in this questionnaire will be exclusively utilized for academic purposes and will be treated with confidence. Assistance given in completion of this questionnaire will be greatly appreciated.

INSTRUCTIONS

Please check the applicable box ( ) or provide your comment in the space provide

SECTION A: BACKGROUND INFORMATION

1. What is your Gender?
    i. Male ( )
    ii. Female ( )
2. Age Bracket
    i. Under 30 Years ( )
    ii. 31-40 Years ( )
    iii. 41-50 Years ( )
    iv. Over 50 Years ( )
3. What is your highest level of Education?
    i. Certificate ( )
    ii. Diploma ( )
    iii. Degree ( )
    iv. Master ( )
    v. PhD ( )

vi. Other(s) ( )

Please Specify----------

---

4. What Position Best Describe you?

i. Pastoral Leader ( )

ii. Pastoral Member ( )

iii. Community Leader ( )

iv. County Government ( )

v. Faith Based Organization ( )

SECTION B: INFLUENCE OF PHYSICAL FACTORS ON SUSTAINABILITY OF INCOME GENERATING ACTIVITIES

The following questions is about the influence of physical factors on sustainability of income generating activities**.** use the point scale below to indicate your level of agreement by ticking each one of the given statements. Each item is on the scale of 1 to 5.

Where 1= Strongly Disagree, 2=Disagree, 3= Neutral, 4=Agree, 5=Strongly Agree

No	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Distance to market plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School					
2	Road networks to plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School					
3	Farm size influences on the sustainability of income generating activities of Kamar Pastoral Field School					

SECTION C: INFLUENCE OF SOCIAL-CULTURAL FACTORS ON SUSTAINABILITY OF INCOME GENERATIONG ACTIVITIES

The following questions is about the influence of social-cultural factors on sustainability of income generating activities**.** use the point scale below to indicate your level of agreement by ticking each one of the given statements. Each item is on the scale of 1 to 5.

Where 1= Strongly Disagree, 2=Disagree, 3= Neutral, 4=Agree, 5=Strongly Agree

No	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Level of education plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School					
2	Religion influences sustainability of income generating activities of Kamar Pastoral Field School					
3	Agriculture extension influences on the sustainability of income generating activities of Kamar Pastoral Field School					
4	Age plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School					

SECTION D: INFLUENCE OF ECOLOGICAL FACTORS ON SUSTAINABILITY OF INCOME GENERATING ACTIVITIES

The following questions is about the influence of ecological factors on sustainability of income generating activities**.** use the point scale below to indicate your level of agreement by ticking each one of the given statements. Each item is on the scale of 1 to 5.

Where 1= Strongly Disagree, 2=Disagree, 3= Neutral, 4=Agree, 5=Strongly Agree

No	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Seasonality plays a					

	significant role on the sustainability of income generating activities of Kamar Pastoral Field School					
2	Climate change influences sustainability of income generating activities of Kamar Pastoral Field School					
3	Topography plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School					
4	Agriculture extension influences on the sustainability of income generating activities of Kamar Pastoral Field School					
5	Age plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School					

SECTION E: SUSTAINABILITY OF INCOME GENERATING ACTIVITIES OF PASTORAL FIELD SCHOOLS

The following questions are about the outcomes of sustainability of income generating activities of Pastoral Fields Schools**.** Use the point scale below to rate your level of agreement on improvements in incomes, livelihoods, resilience, and sustainability. Each item is on the scale of 1 to 5.

Where 1= No Improvement, 2= Low Improvement, 3= Neutral, 4= Great Improvement, 5= Very Great Improvement

No	Improvements	No Improvement	Low Improvement	Neutral	Great Improvement	Very Great Improvement
1	Incomes					
2	Livelihoods					
3	Resilience					
4	Sustainability					

1. What other improvements could you propose to the sustainability of income generating activities.

   …….

   …….

   …….

   …….

   …….

2. How would you rate the achievement of sustainability of income generating activities?

   i. Very easy to achieve ( )
   ii. Easy to achieve ( )
   iii. Difficult to achieve ( )
   iv. I don't know ( )
   v. Very difficult to achieve ( )

3. What recommendation could you give on sustainability of income generating activities?

   …….

   …….

   …….

   …….

   …….

Appendix II: In-depth Interview Guide

Introduction: Thank you for participating in this in-depth interview (IDI). The purpose of this interview is to assess Environmental Factors and Sustainability of Kamar Pastoral Field School in Emining Ward, Baringo County Kenya. Your valuable experiences and perspectives are essential in understanding the factors that influence the sustainability of income generating activities of pastoral field schools.

Confidentiality: Please note that all information shared during this interview will be kept confidential. Your responses will be used for research purposes only, and your identity will remain anonymous in any reports or publications.

Interview Process: This IDI will consist of open-ended questions related to the sustainability of income generating activities of pastoral field schools in relation to the physical, socio-cultural, and ecological factors. The interview will take approximately [estimated time] minutes. Feel free to take your time in providing detailed and thoughtful responses.

Interview Questions:

Can you tell me about your experiences with income generating activities of pastoral field schools?

May I ask if you have received any training, extension support or any other form of support related to pastoral field schools and income generating activities?

In your opinion, how important are income generating activities to the success of pastoral field schools?

Can you tell me about the physical factors, socio-cultural factors, ecological factors and how they influence the sustainability of income generating activities of pastoral field schools?

What challenges, if any, have you faced in sustaining the income generating activities of pastoral field schools? and do you have any suggestions on how to improve the sustainability of income generating activities of pastoral field schools?

Would you like to add anything else about your experience with income generating activities of pastoral field schools and their sustainability?

THANK YOU FOR YOUR PARTICIPATION

Appendix III: Validity of research Instruments

		Total scale
Total Scale	Pearson Correlation	1
	Sig. (2-tailed)	
	N	202
Distance to market plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.831
	Sig. (2-tailed)	.000
	N	202
Road networks to plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.805
	Sig. (2-tailed)	.000
	N	202
Farm size influences on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.860
	Sig. (2-tailed)	.000
	N	202
Level of education plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.846
	Sig. (2-tailed)	.000
	N	202
Religion influences sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.874
	Sig. (2-tailed)	.000
	N	202
Agriculture extension influences on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.858
	Sig. (2-tailed)	.000
	N	202
Age plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.868
	Sig. (2-tailed)	.000
	N	202

Seasonality plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.838
	Sig. (2-tailed)	.000
	N	202
Climate change influences sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.874
	Sig. (2-tailed)	.000
	N	202
Topography plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.850
	Sig. (2-tailed)	.000
	N	202
Agriculture extension influences on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.853
	Sig. (2-tailed)	.000
	N	202
Age plays a significant role on the sustainability of income generating activities of Kamar Pastoral Field School	Pearson Correlation	.839
	Sig. (2-tailed)	.000
	N	202
Incomes	Pearson Correlation	.858
	Sig. (2-tailed)	.000
	N	202
Livelihoods	Pearson Correlation	.853
	Sig. (2-tailed)	.000
	N	202
Resilience	Pearson Correlation	.834
	Sig. (2-tailed)	.000
	N	202
Sustainability	Pearson Correlation	.837
	Sig. (2-tailed)	.000
	N	202

Appendix IV: ANU Research Authorization Letter

AFRICA NAZARENE
UNIVERSITY

30th April 30, 2024

E-mail: researchwriting.mba.anu@gmail.com/ monitoringandevaluation@anu.ac.ke
NACOSTI: registry@nacosti.go.ke Tel. 0202711213

Our Ref: **21J01DMME015**
The Director,
National Commission for Science,
Technology and Innovation (NACOSTI),
P. O. Box 30623, 00100
Nairobi. Kenya

Dear Sir/Madam:
RE: RESEARCH AUTHORIZATION FOR: LUI CHERUIYOT KIRUI ADM 21J01DMME015

LUI CHERUIYOT KIRUI is a postgraduate student of Africa Nazarene University in the Master ARTS IN MONITORING AND EVALUATION (MME) program.
In order to complete his program, Lui is conducting a research entitled: "**ASSESSMENT OF ENVIRONMENTAL FACTORS AND SUSTAINABILITY OF INCOME GENERATING ACTIVITIES OF PASTORAL FIELD SCHOOLS IN BARINGO COUNTY, KENYA: A CASE OF KAMAR PASTORAL FIELD SCHOOL IN MOGOTIO SUB COUNTY** ''
Any assistance offered to her will be highly appreciated.

Yours Faithfully,



Dr. Wanjiru Nderitu

MME, Coordinator,

School of Business,

Africa Nazarene University.

Appendix V: National Commission for Science, Technology and Innovation Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **741289**

Date of Issue: **28/May/2024**

RESEARCH LICENSE



This is to Certify that Mr.. Lui Cheruiyot Kirui of Africa Nazarene University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Baringo on the topic: ASSESSMENT OF ENVIRONMENTAL FACTORS AND SUSTAINABILITY OF INCOME GENERATING ACTIVITIES OF PASTORAL FIELD SCHOOLS IN BARINGO COUNTY, KENYA: A CASE OF KAMAR PASTORAL FIELD SCHOOL IN MOGOTIO SUB COUNTY. for the period ending : 28/May/2025.

License No: **NACOSTI/P/24/35426**

741289

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

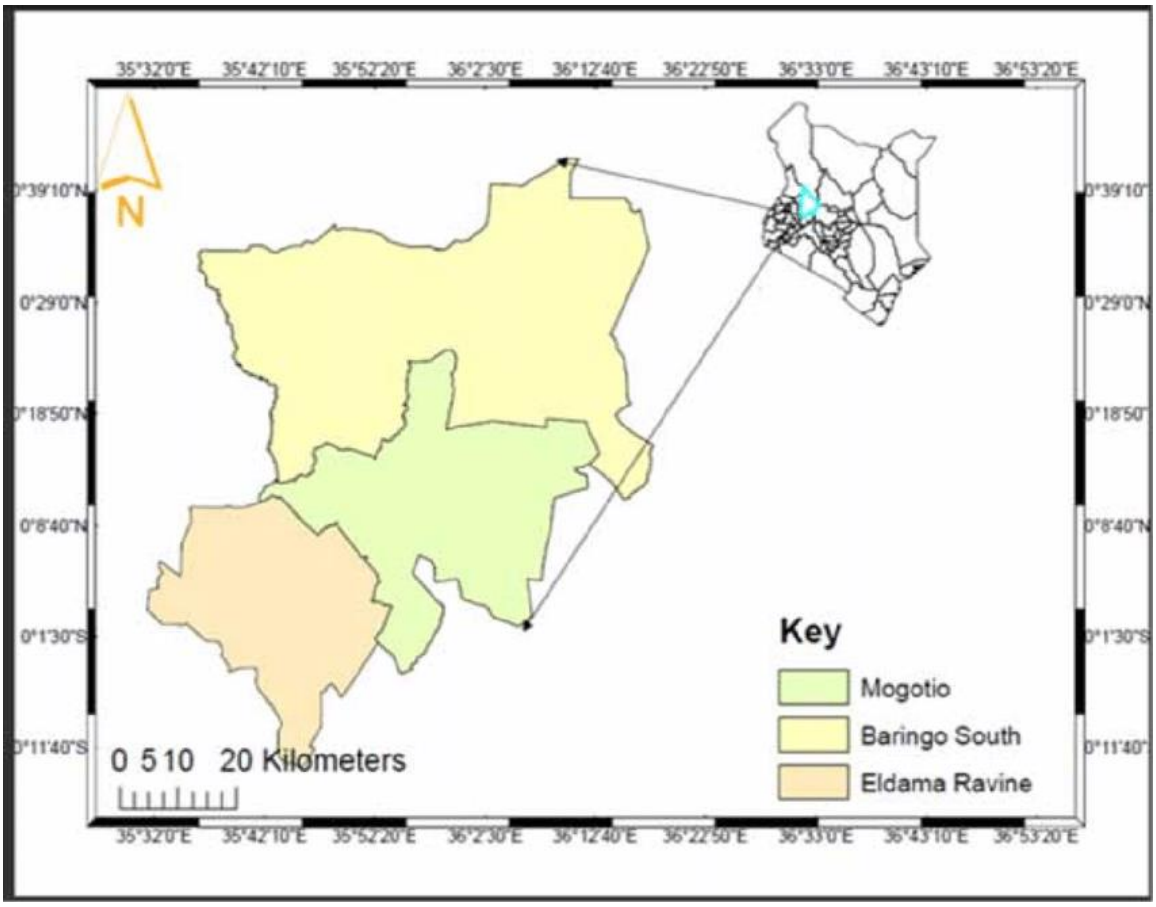
The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix VI: Map of Project Research Area (Mogotio Sub County)



***Source**:https://www.researchgate.net/figure/Map-of-Mogotio-Eldama-Ravine-and-Baringo-South-sub-counties_fig1_336825899*