



UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

**INFLUENCE OF ICT ON REVENUE GENERATION AND LIVELIHOODS OF THE
MEMBERS OF SME-INSTITUTED CO-OPERATIVE SOCIETIES
A STUDY OF SELECTED CO-OPERATIVES IN KIAMBU COUNTY**

NAME: ELIJAH TONUI

REG NO: P54/11444/2018

**A Research Project Submitted to the School of Computing & Informatics, In Partial
Fulfillment of the Requirements for the Award of Masters' Degree in Information
Technology Management, University of Nairobi.**

AUGUST, 2020

DECLARATION

This research project is my original work and has not been submitted for a degree in any other University.



10/09/2020

.....

.....

Signature

Date

Student's Name: Elijah Tonui

P54/11444/2018

This research project has been presented for review with my acceptance as University Supervisor



Signature

Date

Supervisor's Name: Prof Agnes N Wausi

ABSTRACT

Cooperative societies empower many communities globally, in Africa as well as in Kenya. Through increased revenue generation and good performance, cooperative societies contribute towards enhancing livelihood of their members thus making it more sustainable than would have been imagined. Development and performance of cooperative societies can be more enhanced through utilization of Information and Communication technologies (ICTs). As a result, the cooperatives can better support their members through availing funds to them, hence promoting their livelihood. The ICT in cooperative societies can be optimally used for improved service delivery. Cooperative society is primarily structured to meet the necessary common needs of its members to strengthen and enhance their living conditions within the framework of universally accepted cooperative membership principles. The primary objective of this study was to establish the effect of ICT on income generation and livelihoods of members of the SME-based cooperative societies in Kiambu County. The research study was guided by the objectives set out below; examining the extent to which the adopted ICT techniques by select Dairy Co-operative Societies influence access to resources and resource diversification and examining how the underutilization of accessible and reliable ICT platforms impact the livelihoods of individual members in the cooperative societies. Specifically, the study was informed by four theories: Sustainable Livelihood Model Theory, Cost of Capital theory, Reliability theory and Social Capital Theory. The literature was reviewed in the aspects of utilization of ICT by SME-instituted co-operative societies, their impact on members increase in revenue generation, improved livelihood, and performance of cooperative societies. The study used mixed method, quantitative and qualitative data. The sample was drawn from the staffs and selected farmers (members) of Dairy Co-Operative Society in Kiambu County. Purposive sampling technique was used to obtain a sample of SACCO members and SACCO staff targeted for this study. Data was analyzed using both quantitative techniques, Statistical Package for Social Sciences (SPSS) version 25. From study findings, it was concluded that ICT platforms adopted by Dairy co-operative SACCOS tend to influence revenue and earnings in terms of dividends and bonuses that ought to be earned by SACCO members. Keys recommendation is that for the management of dairy cooperatives to communicate the usefulness of ICT adoption and ease of use to its staff and members. This can play a big role in enhancing performance improvement.

TABLE OF CONTENT

Contents	Page
ABSTRACT	iii
TABLE OF CONTENT	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
ACRONYMS AND ABBREVIATIONS	ix
CHAPTER ONE: INTRODUCTION	1
1.0 Introduction	1
1.1 Background of the Study.....	1
1.2 Problem Statement	4
1.3 Research Objectives	6
1.3.1 General Objective	6
1.3.2 Specific Objectives	6
1.4 Research Questions	6
1.5 Significance.....	7
1.6 Study Hypothesis.....	8
1.7 Scope of the Study.....	8
1.8 Limitation of the Study	8
1.9 Summary	9
1.10 Definition of Terms.....	9
CHAPTER TWO: LITERATURE REVIEW	11
2.0 Introduction	11
2.1 An Overview of SME-Instituted Co-Operative Societies	11
2.2 SME-Instituted Co-Operative Societies and Revenue Generation	12
2.3 Theoretical Framework	13
2.3.1 Sustainable Livelihood Model.....	14
2.3.2 Cost of Capital theory.....	16
2.3.3 Reliability theory	18

2.3.4 Social Capital Theory	20
2.4 Review of Empirical Studies.....	21
2.4.1 Influence of ICT Techniques on Performance of Members of the Dairy Co-operative Societies.....	21
2.4.2 ICT platforms and its Impact on Revenue Generation.....	23
2.4 Conceptual Framework	25
2.5 Summary	26
CHAPTER THREE: RESEARCH METHODOLOGY	27
3.0 Introduction	27
3.1 Research Design.....	27
3.2 Target Population	28
3.3 Sample Size and Sampling Procedure.....	29
3.3.1 Sample size.....	29
3.3.2 Sampling Procedure.....	30
3.4 Research Instruments	30
3.5 Pilot Study.....	31
3.5.1 Validity.....	31
3.5.2 Reliability.....	32
3.6 Data Collection Procedure	33
3.7 Data Analysis and Presentation.....	33
3.8 Ethical considerations	34
CHAPTER FOUR.....	35
DATA ANALYSIS, RESULTS AND DISCUSSION.....	35
4.0 Introduction	35
4.1 Descriptive Statistics.....	35
4.1.1 Response Rate.....	35
4.1.2 Reliability Test	35
4.1.3 Demographic Analysis	36
4.1.4 ICT and Risk Factors.....	39

4.1.5 Digital Resource Factors	42
4.1.6 ICT Motivational Factors	45
4.1.7 Influence of ICT on Livelihood and Revenue Strategies	47
4.1.8 Qualitative Analysis for Co-operative Society Managers	51
4.2 Inferential Statistics.....	54
4.2.1 Correlation Analysis.....	54
4.2.2 Regression Analysis	55
4.2.3 Interpretations of the Inferential Statistics.....	56
4.3 Discussion	57
4.3.1 ICT and Risk Factors.....	57
4.3.2 Digital Resource Factors	58
4.3.3 ICT Motivational Factors	59
4.3.4 Influence of ICT on Livelihood and Revenue Strategies	60
CHAPTER FIVE	61
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	61
5.1 Introduction.....	61
5.2 Summary of the Findings	61
5.3 Conclusion and Recommendation.....	63
5.3.1 Conclusion	63
5.3.2 Recommendation	63
5.4 Areas for Further Research	64
REFERENCES.....	65
APPENDIX I: TIME FRAME.....	78
APPENDIX II: BUDGET.....	79
APPENDIX III: LETTER OF INTRODUCTION	80
APPENDIX IV: QUESTIONNAIRES.....	81
APPENDIX V: INTERVIEW SCHEDULE.....	85

LIST OF TABLES

Table 3.1: Study Sample Population.....	29
Table 4.2: Response Rate.....	35
Table 4.3: Reliability and Validity Results.....	36
Table 4.4: Respondents Gender	37
Table 4.5: Age of Respondents.....	37
Table 4.6: Duration of membership of SME-instituted SACCO.....	38
Table 4.7: Demographic Information of Managers	38
Table 4.8: ICT and Risk Factors	39
Table 4.9: Digital Resource Factors.....	42
Table 4.10: ICT Motivational Factors	45
Table 4. 11: Influence of ICT on Livelihood and Revenue Strategies	48
Table 4.12: Correlation Analysis	55
Table 4.13: Regression Coefficients	55

LIST OF FIGURES

Figure 2.1: Sustainable Livelihood Model.....	16
Figure 2.2: Cost of Capital Model	18
Figure 2.3: Reliability Theory Model	19
Figure 2.4: Social Capital Model	21
Figure 2.5: Conceptual Framework	25

ACRONYMS AND ABBREVIATIONS

GDP:	Gross Domestic Products
ICT:	Information Communication Technology
KCC:	Kenya Co-operative Creameries
KFA:	Kenya Farmers Association
MIS:	Management Information System
PDA:	Personal Digital Assistants
SACCO:	Savings and Credit Co-operative
SME:	Small and medium-sized enterprises
SPSS:	Statistical Package for Social Sciences

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter outlines the background of this research study, problem statement, research objectives, research questions, significance of the study justification, scope of the study, limitation of the study and chapter summary. It focuses on influence of ICT on the revenue of members of various cooperative societies within Kiambu County.

1.1 Background of the Study

A cooperative society is primarily organized to provide the necessary common needs of its members that improve and uplift their living condition within the context of the universally accepted cooperative principles of membership, (Mukherjee and Pyne, 2016). According to Sharma (2018), cooperative movement seeks to create autonomous member-based cooperatives that would be democratically and professionally managed; self-controlled; and self-reliant business ventures. A quick appraisal of the situation reveals that cooperatives have largely survived the market forces and continued to grow in number, income and membership. The market forces have triggered a structural transformation that has seen the fading away of the inefficient cooperatives, some cooperatives seek better service provision while at the same time increasingly diversifying their activities and introducing innovative ventures in order to respond to the need of their members (Wanyama, 2016).

Cooperative movements aim at bringing together people of different walks of life, to accomplish a similar goal, regardless of their socio-economic status (Pearson, 2019). The first Co-operative society was formed in 1844 in Rochdale, an England village, during the industrial revolution in

Britain (Mason, 2017). For instance, dairy cooperative societies are playing a significant role in providing loans to dairy farmers politically at the state and national level. Through this, farmers can engage in farming activities thus raise income which in turn can promote their livelihood.

Tuan, (2018) posits that many of the co-operatives have been existent for long, utilizing traditional techniques in product marketing. Consequently, traditional techniques decrease revenue generation among the co-operative member. With the innovations in ICT, co-operatives members get quality services in terms of ease to access loans which can enable them to engage in economic activities (Ahabyoona, *et al.*, 2019). For instance, the societies are using real-time recording of members' products, farmers are tracking their products from production to sale and using ICT solutions to grow the customer base. ICT has been cementing the loopholes where various products would mysteriously disappear or the corrupt channels (Tuan, (2018).

Most of the SME-instituted co-operatives lack extensive full-service branches (Onchieku, and Ragui, 2019; Kyaiitha, and Nzioki, 2017). For instance, major co-operatives in Kenya, have adopted and utilized ICT for daily operations and income generation to its members. The upcoming SME-instituted co-operatives have been using member and customer referrals to generate lead and revenue, hence improving members' livelihood (Feather, & Meme, 2019). They operate as produce and financial institutions. They market the members produce, making profits for the members by looking into factors enhancing profitability for enhanced livelihood.

According to O'Dwyer, and Gilmore, (2018) the SME sector contributes to a sizable amount of the GDP. It is also contributing to easing of the unemployment menace in Kenya. Many SMEs

with the same goal orientation are coming together to create a marketing platform for their services and products (O'Dwyer, & Gilmore, 2018). Typical examples are the Kenyan farmers, who strive to establish co-operatives as a way of enhancing their livelihood. These co-operatives that are established by a collection of SMEs are generally known as the SME-instituted co-operatives or produce- co-operatives (Jeločnik, et al., 2017).

The Kenyan economy is powered by generated revenue from financial institutions among other sectors (Umebali, *et al.*, 2018). Co-operatives are built on savings, mobilization, credit availability and improved living standards of the members. The co-operatives are important economic units designed to promote the members through the rendering of affordable services. Co-operatives pool people with similar economic goals together (Nylund, 2018). When looking into the profitability of the SME-instituted co-operatives, the focus is on the financial statements, revenue generated and the incurred expenses.

Despite the fact that ICT strategies are embraced and commonly stated to have positive impact on service delivery, revenue generation and improved livelihood, some organizations tend to underutilize ICT. Mtega, (2017) indicates that underutilization of ICT translates to poor service delivery which in turn translates to low income and poor livelihood of rural farmers. This is because the rural poor farmers only embrace mobile phone and TV. Their failure to adopt the developed ICTs by a number of interventions by government, NGOs, development partners and the private sector, has negatively impacted on the livelihoods of the rural poor. According to Mbuyisa and Leonard, (2017) ICTs can contribute to improving rural livelihoods through

improved businesses, increased access to education, ease of communications and increased access to key information.

This study examines the adopted ICT systems being utilized for tracking of members produce from production to the final market, ICT techniques for data analysis and how the techniques employed are used for increased revenue and enhancement of farmers' livelihood. The focus was on the revenue generation and livelihoods of the members of SME-instituted dairy co-operative societies in Kiambu County. It examined at how the farmers' co-operatives have started utilizing software specifically tailored for the co-operative's operations, to grow their asset base and increasing their products.

1.2 Problem Statement

ICT is still developing, given the scenario of growth in Kenya's agriculture. Consensus in evaluating the utility of ICT in agriculture is that substantial efficiencies can be achieved through the use of modern technology in upstream and downstream processes within cooperative societies. However, there is still a low uptake of technological products in the agricultural sector and, in particular, of cooperative societies in Kenya, which translates into low-income generation (Gweyi, 2018). Low usage or under-use of ICT is attributed to the fact that not all cooperative societies, and in particular dairy cooperatives, are convinced of the effectiveness of ICT in increasing their productivity. The factors that influence implementation of ICT solutions in dairy farming cooperative societies must therefore be assessed to understand how the revenue of members is impacted by ICT.

In Kiambu, there is a low rate of ICT usage in the SME sector, including SACCOs and cooperative societies. Nevertheless, several farmers have recently begun to adopt technological advances in their production monitoring, inventory management and current price comparison. This has led cooperative companies in Kiambu to aim to keep up with the technology by using ICT in the marketing of their goods.

A number of studies carried out on the utilization of ICT by: Gathu (2017); Mutiso (2017); failed to provide detailed insight into factors affecting ICT implementation in dairy farming cooperative societies. Although the studies listed here have achieved their objectives, they have not explored factors that affect ICT solutions to members of dairy farming cooperative societies. There is little published work on factors that affect the ICT utilization by members of dairy farming cooperative societies, particularly in the context of developing countries in dynamic African region and specifically in Kenya.

This research therefore investigated the influence of ICT techniques on the increase of revenue generation to farmers from selected farmer-cooperative societies. It thus concentrated on the importance of ICT in increasing revenue of members in cooperative societies. This research is important to the understanding of revenue trends of members in cooperative societies in Kiambu County. The goal of this study is to bridge this information gap that has been existent.

1.3 Research Objectives

1.3.1 General Objective

The general objective of this study was to examine the influence of ICT on the revenue generation and livelihoods of members of the SME-instituted co-operative societies in Kiambu County.

1.3.2 Specific Objectives

This study was guided by the following objectives:

1. To examine the extent to which adopted ICT techniques by select Dairy Co-operative Societies in Kiambu have influenced member access and diversification of resources for revenue generation.
2. To examine how ICT platforms, impact the revenue avenues and livelihoods of individual members in the cooperative societies.

1.4 Research Questions

The questions to be answered by this study are:

1. How reliable are the adopted ICT techniques by members of SME-Instituted co-operatives in revenue generation?
2. How has resources diversification due to ICT impacted revenue avenues for the members of cooperative societies?
3. How has the implementation of ICT automated payment systems of dividends and shares by the management of societies impacted the livelihood of members?

4. How has utilization of the adopted ICT platforms impact social stratification among members of cooperative societies?

1.5 Significance

In any cooperative society, financial performance plays a major role in effective service delivery. Most cooperative societies in Kiambu County have started using ICT for pooling of financial resources. The employed ICT techniques are playing a role in realization of financial targets. The research findings are essential in the management of SME-instituted co-operatives. This would portray growth determinants to produce co-operatives management. The study helps the development partners and policymakers for the formulation of policies in promoting the growth of these SME-instituted co-operatives. The results can be used by the Kenyan government when promoting the development agenda, the big four agenda and Vision 2030. The members and development partners would find this research useful when designing funding programs for improving the produce co-operatives. This study is going to positively contribute to the Kenyan education sector.

The lessons from the study would influence the decisions made by co-operatives when implementing ICT techniques and introducing the techniques to members. This would boost the market potential, profitability, customer base, and the revenue generated. The study shows how the size of the SME-instituted co-operatives and the products offered are contributing to lead and revenue increase. This study would facilitate individual researchers for the identification of gaps in the current research area. The study was enhancing the professional knowledge of the researcher for the acquisition of skills necessary for increased profitability. The results of the

study indicated that there is a significant impact of ICT platforms on revenue generation among members of Dairy co-operative societies.

1.6 Study Hypothesis

This study sought to determine the existing relationship between ICT and member revenue in the cooperative societies.

H0: There exists a relationship between ICT and revenue of members of cooperative societies

H1: There is no an existing relationship between ICT and revenue of members of the cooperative societies

1.7 Scope of the Study

The study was carried out on the marketing, financial and consumer departments in the select Dairy Farmers and Co-operative Societies in Kiambu County. This would ensure an understanding of the factors for revenue increase in the SME-instituted co-operatives. For this study, research was conducted by the issuing of structured questionnaires and interviews. The focus was on select cooperative societies in Kiambu County.

1.8 Limitation of the Study

The study was using a sample population, yet Kiambu County is home to several cooperative societies, with every society having its own fair share of challenges. When conducting the study, an assumption made was that the data collected is accurate and free from any errors, presenting the actual ICT impacts on revenue increase in cooperative societies.

There might be a language barrier as Kiambu County is a cosmopolitan town and the members might have distinct various local languages. Some members in the co-operatives lack the knowledge on the measures their co-operative is undertaking for efficient digitization.

This limitation was addressed by engaging local research assistant who speak the same language with the majority of co-operative members.

There was also an issue of confidentiality in terms of information sought by researcher which was tackled by making sure that the research collection tools carry no names of the respondents.

The operational assumptions are that respondents were willing to take part in the study and provide truthful responses. This might be hindered by members not willing to disclose their produce records or not willing to share information with a non-co-operative member.

1.9 Summary

The study was limited to how cooperative societies in Kiambu County are improving the lives of its members by using ICT in their operations for revenue increase. The focus was on how the members are rewarded for referring new members and how ICT is growing the member base in the co-operative. The enquiry was on how the society is rewarding members after they refer new customers through digital platforms. The study would extend to cover the basic digital platforms these SME-instituted co-operatives have adopted.

1.10 Definition of Terms

Autonomous member-based cooperatives: These are cooperatives which are run by their members

- Cooperative society:** It is a volunteer association that started with the goal of offering financial support to its members.
- ICTs:** In general, it is agreed to mean all devices, networking elements, applications and systems that enable people and organizations to be combined.
- Inventory management:** This is a systematic approach to inventory procurement, storage and sale — both raw materials (components) and finished goods (products).
- Production monitoring:** It is a product inspection conducted on-site each day of your development.
- SME-instituted co-operatives:** It is an independent group of small and medium-sized enterprises, jointly joined to meet their collective economic expectations through a joint venture

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter discusses the existing literature applicable to the thesis as provided by other scholars and researchers. The chapter addresses the hypotheses on which this thesis is based in the theoretical literature section. It also outlines empirical literature of the study, which covers previous studies on the impact of ICT on income generation, and livelihoods of members of the SME-based cooperative societies in Kiambu County. In addition, the chapter presents the conceptual framework that unravels the relationship between the study variables and the summary chapter. By pointing out the gaps in previous studies, the current study gives a fair chance to recognize gaps that remain.

2.1 An Overview of SME-Instituted Co-Operative Societies

In Kenya the cooperative sector has continued to expand as in other African countries (Wanyama, 2016). This was despite the economic difficulties which plagued the continent. For example, cooperative movement in Nigeria began with the colonial masters, in 1935 when cooperative legislation was formulated and enacted (Onah, 2017). During this time, the Western Region's cocoa farmers established marketing societies with the sole purpose of checking middlemen's excesses and ensuring the marketing of pure and unadulterated cocoas.

In Kenya, the first Co-operative Society, the Lumbwa Co-operative Society, was founded in 1908 by European Farmers with the main objective of buying fertilizer, pesticides, seeds and other farm inputs and then marketing their produce to take advantage of economies of scale (Chepkwei, et al., 2017). The African smallholder farmers fought for the establishment of their

own cooperative societies and later the dairy cooperative society was established in 1928 in Nanyuki known as Nanyuki Cooperative Creameries and later an enactment of the 1930 Kenya Cooperative Ordinance leading to KCC and KFA registration in 1931 (Kwanya, et al., 2019). All the cooperative creameries under the Kenya Cooperative Creameries were united in 1931. In the 1950s co-operatives for cash crops including coffee and pyrethrum were permitted to be promoted and licensed. As a result, 1,030 Co-operative Societies with 655 active with a total membership of 355,000 were active at independence in 1963 (Nyandika et al., 2016).

Cooperative growth is phased into two phases, the 1960s to 1980s post-independence period and the early 1990s age of liberalization (Gitau, 2019). Legal mechanisms in both phases gave African governments like Kenya powers to direct and control cooperative societies' affairs, which enjoyed trade monopolies. Rarely have the cooperatives been fully voluntary, autonomous or independent, but eventually embroiled in state politics (Gitau, 2019).

2.2 SME-Instituted Co-Operative Societies and Revenue Generation

Dairy Cooperative Societies for three major milk production systems in sub-Saharan Africa were formed in East Africa; pastoralists, farmers, and farmers (Kilima, et al., 2020). It was attributed to a downward scale of cattle income, and thus possible off-take of milk. In traditional (indigenous breed) systems, household demand and market access determine actual off-take ranging from near zero to 500 kg per lactation. These traditional systems and their indigenous cattle breeds dominate milk production in eastern Africa with the exception of Kenya (Kelly, et al., 2016). Nevertheless, they contribute relatively little to marketed growth, primarily due to

challenges such as poor access to major urban markets, low ICT adoption leading to mismanagement of cooperative dairy societies among others (Kankindi Boani, 2019).

Dairy cooperative societies are very central to sustainable development as they are primarily intended to empower the communities, particularly in rural areas where agriculture is the main stay (Sudan, 2019). The cooperative movement has put together 800 million people worldwide according to figures by the United Nations. Dairy farmers have depended heavier on dairy cooperative societies to sell their milk than any other commodity farmers have (Sultana, et al., 2020).

These cooperative societies, however, face numerous challenges, especially after liberation, and most cooperative societies in Nyeri County are experiencing performance compared to other cooperative societies in similar regions (Njeri, 2017). The factors that could influence the poor performance of cooperative societies in the liberation era include: lack of training and unpreparedness of cooperative societies to modernize and embrace change, poor marketing strategies and competition from other players, lack of essential services and poor management and leadership, as most cooperative leaders have low level of education.

2.3 Theoretical Framework

Kruglanski, (2018) defines theory as a collection of interrelated concepts, assumptions, and generalizations systematically describing and explaining behavior. The theoretical framework on the produce co-operatives research was linking the practical and theoretical components of investigations being undertaken. Theoretical framework implicates every decision undertaken in research. The hypothesis for this study is determining whether there exists a valid relationship

between ICT and revenue increase for members of cooperative societies. The theoretical framework makes logical sense of relationship factors and variables deemed important. A theoretical review provides the relationship between the variables; they are theorized for a proper understanding. It guides the research, determining the factors to be measured and what the research was looking for.

2.3.1 Sustainable Livelihood Model

Sustainable livelihoods are developing at the intersection of development and environmental studies to provide a new way of thinking about work, in particular the work of vulnerable communities. Livelihood is the assets such as resources, claims, stores and access, capabilities and the requirements necessary in living facilitation. Sustainable livelihood model was developed in the 1990s and it implies where one would cope and recover from stress and shock while enhancing and maintaining their livelihood assets and capabilities for the future generations (Sari, *et al.*, 2018). The sustainable livelihood projects help to cope with challenges relating to food insecurity in the 80s. This model is essential in evaluating how the members of cooperative societies have been utilizing ICT for revenue increase. Most members of these cooperative societies make up the rural majority who deal with the issues affecting their lives. This entails implementation and formulation of new and the existing government and private sector policies linked to resources ownership and access.

This is an analytical framework in the influence of ICT on the livelihood of cooperative movements as it delivers relevant information to the members and administration of the cooperative societies. A case study by (Mpiima, *et al.*, 2019) in Uganda aimed at demonstrating the role of mobile phone utilization in the rural regions for cost reduction in subsistence farming.

He further stated that Transforming Processes such as Laws, Policies, Culture and Institutions contribute towards increasing revenue generation as well as improving livelihood. In general, a cooperative member in Kiambu County with adequate ICT skills is empowered to gain in a competitive and technology-oriented produce market. Both the ICT transforming structures and processes can directly influence the livelihood outcomes of farmers by increasing more income, increased well-being, reduced vulnerability and improved food security.

This study focuses on the impact of ICT utilization on the revenues of members in member cooperative societies and how this is improving their livelihoods. The main assets under consideration in this study were the financial resources. It dissects the contribution ICT strategies on members' sustainable livelihood. This is the main analytical model to be utilised in the study when understanding the impact of ICT on the livelihoods of the members. This study was measuring the livelihood strategies by measuring the livelihood outcomes. This would entail looking into the well-being of members, food security and increased income.

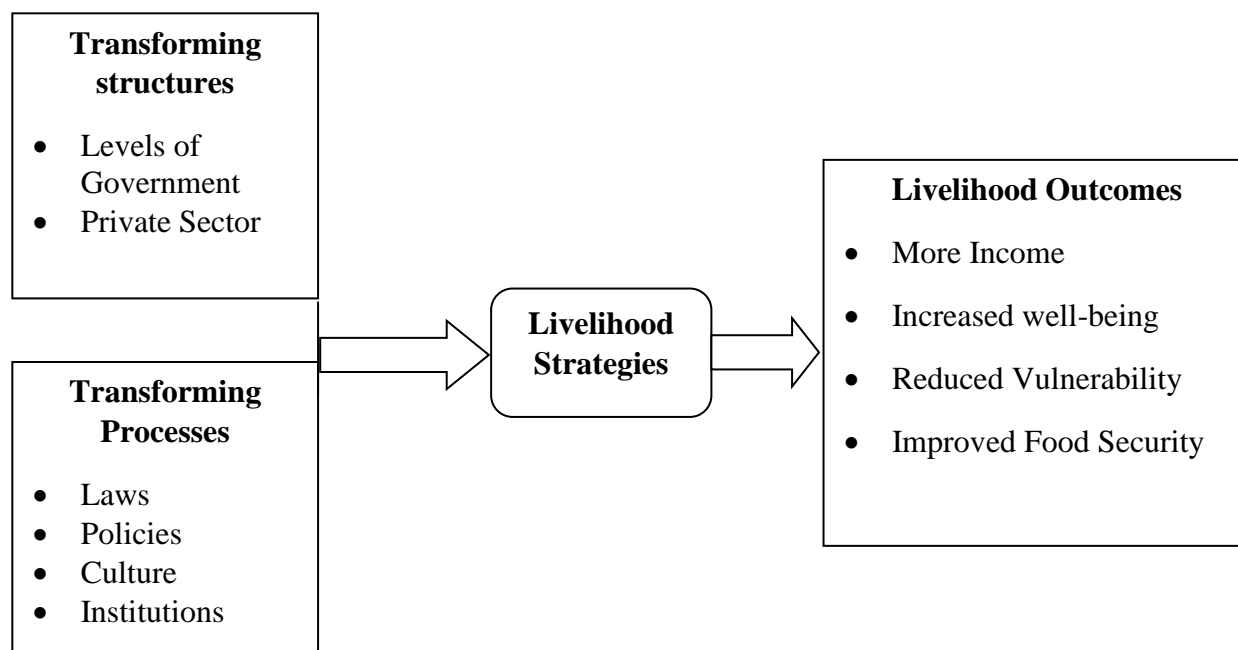


Figure 2.1: Sustainable Livelihood Model

Source: Author, 2020

2.3.2 Cost of Capital theory

According to (Brusov, 2018), this theory describes the required return by organizations and Financial institutions, providing finance to corporates and individuals for assets acquisition and ensuring running or continuation of business operations. This focuses on the capital resources availed to members by their cooperative societies for increased revenue on their produce. The cost of acquiring the funds ought to reflect in the organization’s capital structure cost of preference capital made by cooperative societies. This implies inclusion of equity and debt costs.

This model states that cost of retained earnings can be utilized as the discount rate in the net present value of investment projects and the techniques employed by the cooperative societies.

Members of cooperative societies prefer investments with a positive net present value at the capital cost. These are accepted as they add value to the generated revenue. For a member of a cooperative society, the ICT technique to be utilized has to be a positive investment. According to (Mmari, and Thinyane, 2019) the members of a society reject negative investments as they reduce the wealth generated by as they earn less than the projected returns. Therefore, the cost of capital plays a vital role in the management of finances by the members of the SMEs-instituted cooperative societies.

Sathyamoorthi, et al., (2016) state that the models are used to calculate source costs for finances start from premises that required return rate is a function of the expectation of investors'; the future cash flow returns, expressed as a percentage of the current value of their investment. The cost of equity share capital is calculated using the dividend valuation model. The assumption is that future dividends are expected to grow at a reasonably even rate. According to (Mmari, & Thinyane, 2019), in a market with zero imperfections, developing obsession on the source of money is misguided, thus businesses ought to focus on the quality of their investment decision.

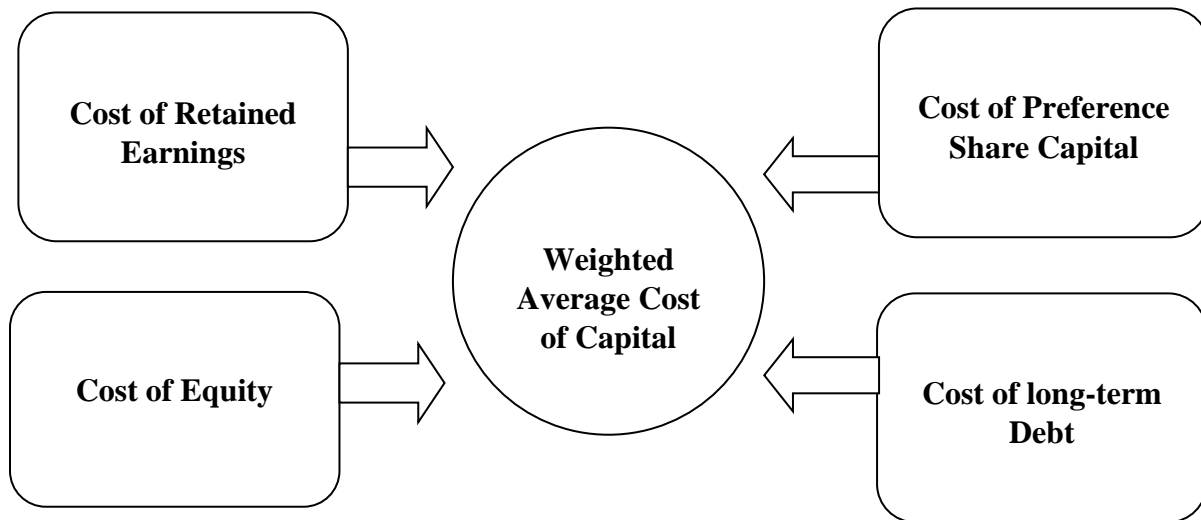


Figure 2.2: Cost of Capital Model

2.3.3 Reliability theory

This is a theory explaining the capability of control systems, in effectively undertaking roles and accomplishing them within a required time (Schlechta, 2018). This theory states how organizational components in the internal structure of an organisation for good financial management. Every element of a firm works for the success of the firm. From Wang, et al., (2016) reliability is an essential component in internal crisis control systems. It can help the members of cooperative societies to maximize profits and generate more revenue which can be used to improve access to financial aid for the subsequent improvement in their livelihoods.

According to (Rubino, 2017), the internal control structures play a major role in the identification, assessment and mitigation of risks in an organisation. They detect errors,

preventing the consequences on a timely basis, for prevention of losses. Joseph, (2018) indicated that many developments have arisen, giving rise to strategies for proper management of proper internal control systems. For effective and efficient financial performance, ICT techniques should be checked regularly for accuracy. Luster, (2018) indicated that technological advancements have provided loopholes for fraud, lack of interest and support from top management of an organisation, for improved internal control systems which would counter the menace negatively affecting the organisation.

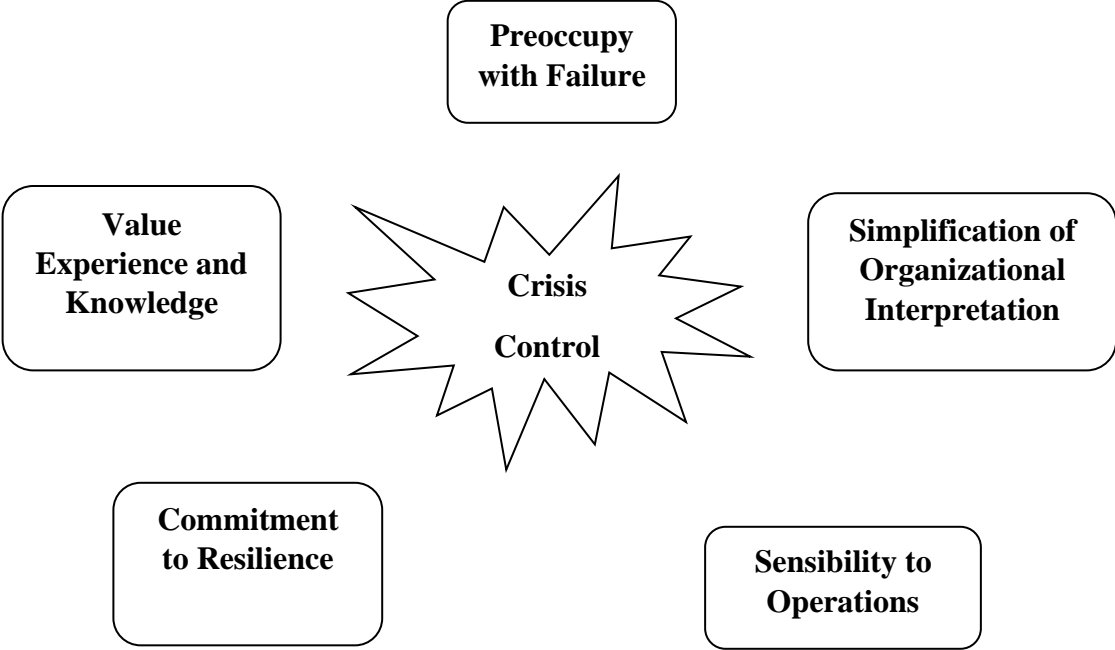


Figure 2.3: Reliability Theory Model

Source: Author, 2020

2.3.4 Social Capital Theory

According to Huang, (2016) social capital theory portrays that social capital reduces the costs in an organization as reputation and trust among management and members reduce requirements for expensive and unnecessary pre-cautionary measures. The management makes decisions that enhance the organizational performance with minimal hindrances.

This theory suggests that social capital contributes immensely to the cooperation in the cooperative societies, leading to effective operations and minimum costs, playing a major role in the determination of success or failure of an organization (Belay, 2018). It is an involvement of Traded and Non-traded interdependence as well as Trust (Benevolence and Dependability) which can produce Knowledge acquisition and Knowledge creation within the SMEs-instituted co-operatives.

Tenzin and Natsuda, (2016) argued that the cooperative societies require social capital as they are network organizations with the main purpose as providing mutual benefits to members. The agricultural cooperative societies are established to merge people to farm produce, create and coordinate resources, undertaking marketing of the produce for the benefits of the members. The members of cooperative societies in Kiambu County purchase raw materials and sell their produce through cooperative societies is easier due to their commitments. The members take advantage of the collective actions for increased revenue.

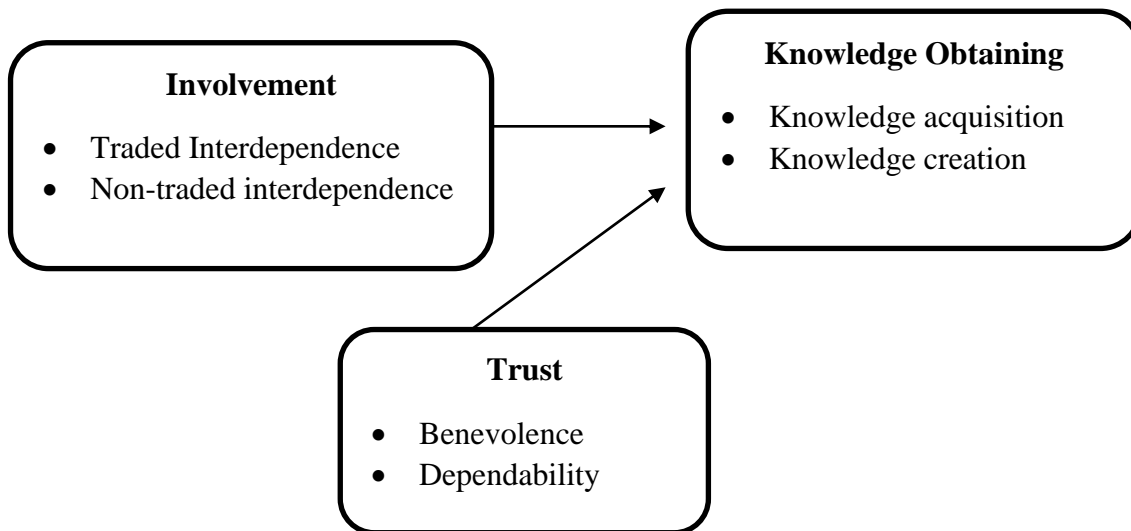


Figure 2.4: Social Capital Model

2.4 Review of Empirical Studies

2.4.1 Influence of ICT Techniques on Performance of Members of the Dairy Co-operative Societies

George (2019) claims that the advantages of ICT to cooperatives are multiple. Through the full use of ICTs, members can increase quality of their produce by networking with other members with advanced skills. ICT helps improve the management of the cooperative societies by strengthening management practices, financial information and reporting and record keeping, as well as establishing an online presence. Such enhancements help to increase productivity and reduce operating costs (Englund, et al., 2016). ICTs can change the way members of the cooperatives operate and bring vast benefits, especially in agriculture. Cooperatives providing access to information such as crop cycles, regional weather reports, farming methods as well as local markets, available on the internet or directly through text messages, are just one instance of

how creative ICT use can revolutionize day-to-day functioning of cooperatives and support members (Shrivastava and Vardhan, 2018).

Information and Communication Technology (ICT) has been recognized as a facilitator of globalization and is becoming a global village (Yim, et al., 2019). UN International Year of Cooperatives (2012) highlighting the role of member cooperatives in poverty reduction, job creation and social integration-reconstruction. Ember cooperative societies in India have played a vital role in developing the farming, banking, finance, agro-processing, storage, manufacturing, dairy, fisheries and housing sectors. Cooperatives that play a leading role in poverty alleviation, food security and job creation are well-proven (Oloyede, et al., 2017). ICT can revolutionize the way cooperatives operate and bring enormous benefits, especially in agriculture. Cooperatives provide access to information such as crop cycles, weather reports, farming methods and local markets, available online or via text messages. How creative ICT use can change the day-to-day operation of members of cooperatives. The simple ICTs are fluid in the creation of cooperatives, but some tasks need to be addressed, namely cost and infrastructure issues related to access. In order to facilitate or provide cooperatives with access to ICTs, help must be given to developing an enabling environment, including a legal, regulation, business environment and sharing mechanisms that are useful for the creation and development of organizations (Wanyama, 2016).

Mojo, et al., (2017) argues that its simple ICTs are crucial to the growth of cooperatives, but there are some obstacles that need to be addressed, namely access costs and infrastructure issues. While access to telephone communications is now widely available throughout the world, many rural communities still do not have secure Internet and mobile broadband access (Mojo, et al.,

2017). Awareness of the benefits of ICT is still a problem in areas with little to no internet access, so it is necessary to get smaller member cooperatives to bridge the digital divide. According to (Sami, et al., 2016), connectivity to connectivity is the missing link between the developed and developing worlds.

2.4.2 ICT platforms and its Impact on Revenue Generation

Member cooperative societies may use information systems to respond effectively to the market (Laurini, 2018). Small companies gain competitive advantages as they use IT: they increase their production speed, they can introduce new production technology, they can adapt easily to any consumer demand (Chelangat & Namusonge, 2018). As a result of the implementation of the IS, the structure of the market may change and this may alter competition rules, create competitive advantages and generate new businesses. Because savings and credit companies are currently facing serious competition from commercial banks, this is a factor that could be overcome by use of ICT (Chelangat & Namusonge, 2018).

The ICT needs of microfinance institutions and cooperatives focus mainly on three objectives: sharing information with remote customers, storing and handling data at the institutional level, both in central offices and remote locations, and the potential for losses during monetary transactions (collection / delivery) in remote areas (Bent, 2019). Management Information System (MIS) meeting the needs of MFIs consists of multiple components, including desktop and server hardware components, handheld devices, mobile phones, network components and protocols, and user interface software components, databases (Njuguna 2017).

The Sessional Paper on Cooperative Development Policy (2004) suggests that the cooperative movement as a whole has been faced since 1997 with the challenges of liberalizing its economic activities and developing a competitive market economy (Ngongo, 2019). It continues to state that perhaps the Government of Kenya has accepted ICT as an essential tool for managing cooperatives today. Current use of ICTs, like the Standard Management Information System (MIS), smart cards, Personal Digital Assistants (PDAs), cell phones, and other technology, enables cooperative companies to support their clients more efficiently via reduced paperwork, access to information, as well as the ability to compute complex analyses (El Kadiri, et al., 2016). Nevertheless, the rate of ICT overall implementation in the cooperative movement remained low. Most of the businesses that have managed to automate their operations have done so on an individual basis (Chatterjee, et al., 2017).

In Kenya, the SMS-based electronic money transfer system has changed the lives of millions of Kenyans, including rural poor people (Jacob, 2016). M-PESA makes direct transfers to those living in remote areas miles away from traditional commercial banks. The M-PESA allows them to exchange e-money in cash and vice versa through M-PESA kiosks and to deposit or withdraw bank notes if necessary. M-PESA helps them to move money home or to easily sell livestock without loss of cash flow over long distances and also decreases debt and overdue payments due to promissory payments from customers (Onsongo, 2019).

2.4 Conceptual Framework

The conceptual framework portrays an existing relationship between the independent and dependent variables. This is essential in pointing out the existing relationship while testing the importance of the proposed links. It is concerned with the evaluation and description between variables. According to (Evans, 2017), it is viewed in explaining movements in a variable by referencing to movements by variables. Conceptual framework is based on the sustainable livelihood model as the analytical framework. It portrays the ICT influence on the relationship in revenue generation to members of Co-operative Societies.

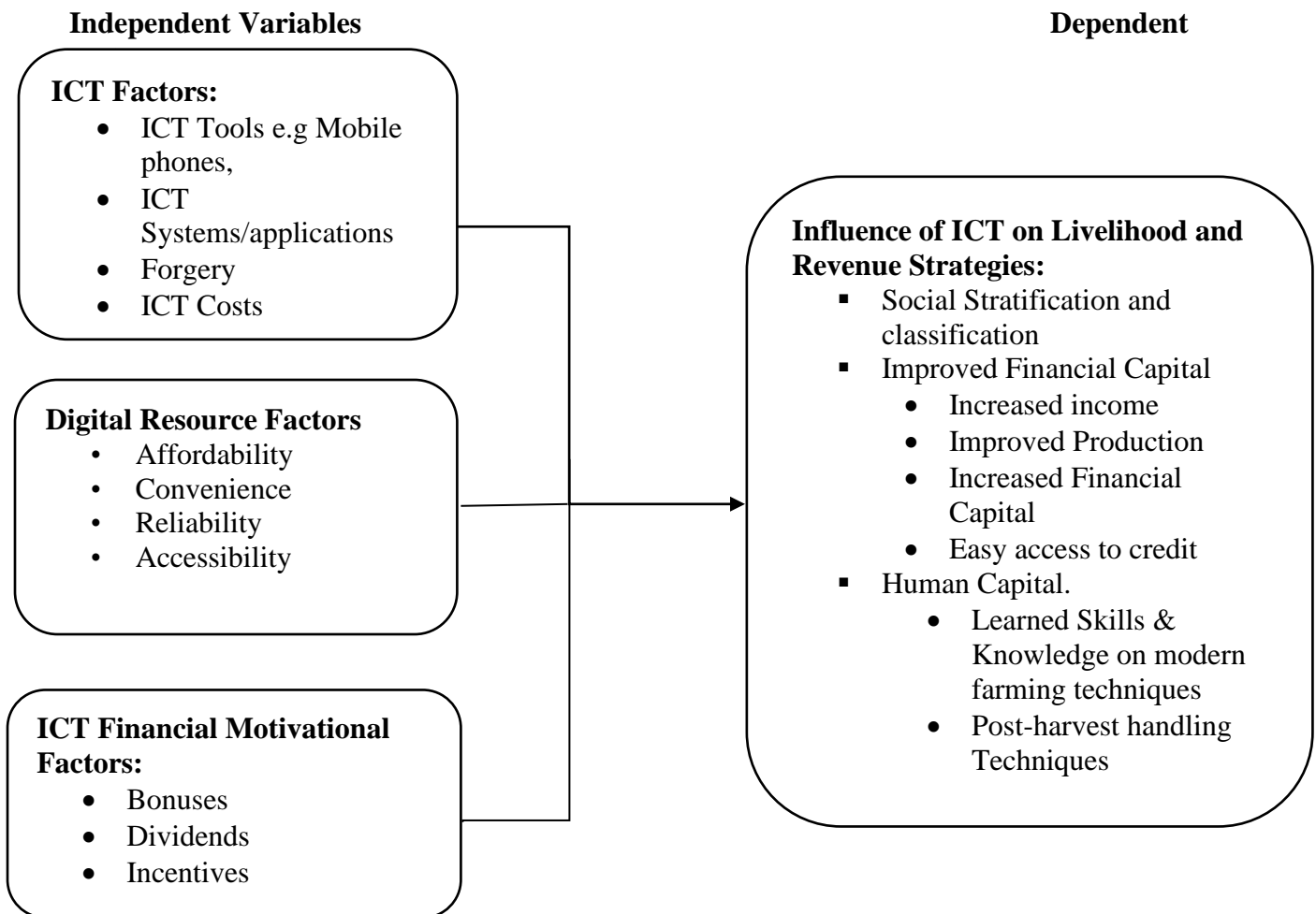


Figure 2.5: Conceptual Framework

Source: Author, Tonui 2020

From the sustainable livelihood model, ICT have an immense impact on various resources utilized for improved living conditions. It portrays the influence of ICT on the livelihoods of members in cooperative societies. It expounds on ICT tools and capital resources in revenue generation. This model is effective when utilized with other models such as the cost of capital, reliability, and social capital theory; clearly giving insights into the model.

The social capital theory dissects and allows an understanding of power relations in the social-economic planes of the study. The independent variables in this study are ICT Resources and Risks, Capital resources and ICT Financial Incentives. The dependent variable is the influence of ICT on the Livelihood of members and Revenue strategies. The dependent variable is studied under affordability, resource diversification, convenience, accessibility, reliability and social stratification among the members.

2.5 Summary

From the literature review, there was an understanding on how digitization of SME-instituted co-operatives and its impact on the operations of these co-operatives. Many members of these co-operatives are limited by inadequate economies of scale, little diversification and underutilization of digital technology. Digitization of the produce-oriented co-operatives assists in removing barriers limiting the growth of their member cooperative societies.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter sets out the procedures and techniques used in the collection, processing and analysis of the data. The chapter discusses research design, target population, sample design, data collection techniques, data analysis and ethical considerations.

3.1 Research Design

This is a framework under which study is undertaken. It is the arrangement of conditions for the collection and analysis of data in a way aimed at combining relevance with the purpose of research (Creswell and Creswell, 2017). The study adopted a descriptive study approach, describing existing attitudes and conditions through interpretation and observation techniques (Leavy, 2017). This study employed a descriptive research design to gather adequate and relevant information for this research. It enhances the collection of data samples without manipulation and description of concepts in this study.

Atmowardoyo, (2018) reveals that descriptive research is aimed at portraying an accurate profile of situations, events or persons. In human contexts, the descriptive research design is among the best methods in researching as it accurately portrays current facts through data collection for hypothesis testing and answering questions for concluding the study. Descriptive survey design worked well in the study as am focusing on related variables. A descriptive study is designed to obtain data concerning current phenomena and the possible solutions to enable a researcher to draw suitable conclusions from the fact under considerations.

According to (Ivey, 2016) descriptive research aims at describing observed phenomena without variable manipulation. The research design used quantitative and qualitative data, essential in concluding this study. The research design created room for summary, data gathering, interpretation plus results presentation. Survey studies are evaluated against the weaknesses and strengths of statistical, quantitative research methods and analysis tallying with the present study (Lee, 2017).

3.2 Target Population

Kern, et al., (2016) defines population as the aggregate or total number of individuals or people with similar features or characteristics. Target population is the group of items possessing similarity that the study focused on. The study targets dairy co-operative societies in Kiambu County namely, Limuru Dairy, Githunguri Dairy, Kiambaa Dairy, Lari Dairy and Kabete Dairy farmers and cooperative societies. Among the 5 co-operative societies, the study sampled members of Githunguri Dairy co-operative society with a total membership of 10,000 farmers. In addition, qualitative data was collected from 5 members of Githunguri Dairy co-operative management team. The study focused on the ICT techniques being utilized for produce collection; including accurate recording of member produce, marketing of the produce and revenue increase for members of the five cooperative societies.

3.3 Sample Size and Sampling Procedure

Jain and Prasad, (2018) states that a sampling procedure is a method applied in the selection of an ideal representation of an entire population, and a sample is the total items or objects selected to be representative of a whole.

3.3.1 Sample size

Nayak, (2010) indicates that a study sample size can be set to range from 1% to 40% depending on the size of the targeted population. This study therefore sampled 2% of the 10,000 farmers (200 sample size) from Githunguri Dairy co-operative society in Kiambu County. The study sample population was determined by using systematic sampling. The interviews were conducted on 5 management team in the co-operative societies coordinating the collection and marketing of member produce.

Table 3.1: Study Sample Population

	Study Population	Sample Size %	Sample Size
Quantitative Data	10,000	2%	200
Total	10,000	2%	200

3.3.2 Sampling Procedure

Sampling is the selection of units to include in a study. The units selected were representative of the entire study population. Members were divided into homogenous clusters using two-stage cluster sampling. Every ward formed a cluster, then stratified sampling was used to obtain two heterogeneous strata; old members and new members, and the heterogeneous strata had homogenous units.

3.4 Research Instruments

Structured questionnaires and structured interview schedules were used for the collection of information. The questionnaires were used since they are cheap and require minimal administration time. Structured interview schedules were utilized to know why and how the questions relate to ICT in revenue increase to easily navigate the in-depth interviews.

According to (Rosenthal, 2016), in-depth interviews are the best instruments in research studies seeking to answer how and why. Five in-depth interviews were conducted using structured interview schedules on the management of the farmers' co-operative societies. The interviews helped in the understanding on how cooperative societies have been using ICT for revenue increase to the members. The structured interview schedules ensured maximum information is obtained from the interviewees.

Semi-structured schedules were adopted in this study when dealing with the old co-operative members as most of them are elderly and have minimal literacy levels. The semi-structured interview schedules were in vernacular language to eliminate chances for inadequate data. In the

semi-structured interview schedules, the general question was narrowed down to the topics relating to this study. This way obtained information is sufficient on all phenomena relating to the study. Bearman, (2019) states that semi-structured interview schedules create room for asking questions arising from the interview.

Structured questionnaires were used in the study. The questions in the questionnaires were close ended as well as open-ended. The open-ended questions allowed respondents to express their views on ICT for member's revenue increase in the select co-operative and the close-ended questions provided accurate quantitative data. The questionnaires were distributed to the members through individual distribution of hard copies to some members to create a rapport, social media platforms, and E-mails for fast, cost-effective data collection.

3.5 Pilot Study

Piloting requires the conduction of small-scale trials on the selected participants. Twenty members were in the pilot study so that they comment on particular aspects of the study instruments. Sahu and Singh, (2016) states that when conducting studies on various projects, it is essential to conduct tests with the use of a pilot study. According to (Sahu and Singh, 2016), pre-testing the study instruments provided room for the revelation of errors before the actual data collection, and ten percent of the sample population was adequate to conduct a pilot study.

3.5.1 Validity

Arias, *et al.*, (2018) define validity as the content of the instrument, concerning the study components. To know how valid research instruments are, the supervisor and my peers expertly

judged the study instruments. Their feedback helped improve the research instruments. Taherdoost, (2016) states that instruments are validated through content validity methods which measure the extent of representation on particular content concepts or indicator domains. Validity was constructed to determine the psychological construct features or nature measured by research instruments. In addition, Taherdoost, (2016) states that validity of a data collection instrument mean that the instrument measures what it's intended to.

3.5.2 Reliability

Reliability is the extent to which findings in a research study can be replicated, following the same method (Koo, 2016). Reliability is the consistency of data collection instruments, considering results given out after different results (Monahan, 2019). To obtain reliable results, qualitative research methods including interviews and extensive literature review was used to gather information relating to revenue increase for members of the cooperative societies.

The piloting method was using twenty questionnaires on twenty percent of the target population, who won't be included in the study. The feedback obtained from the pilot study allowed the adjusting of research instruments accordingly. At an interval of two weeks, the instruments was retested using the same pilot group; however, the questions was shuffled and different colored papers was used. The study used Chronbach alpha with the coefficients ranging from 0.00 to 1.00, to indicate the reliability of questionnaires on all variables.

3.6 Data Collection Procedure

After approval, permission was sought from the respective Farmers & Co-operative Societies through the University of Nairobi. Permission from the university was essential in conducting the study, the permit was obtained by writing an official letter, addressed to the Research department of Nairobi University through the Dean Student Affairs. A permit was obtained from Kiambu County government. After receiving the go-ahead, I created a rapport with the respondents. The rapport created a trust bond which increased chances of getting accurate and honest responses. Data was collected using questionnaires, interviews and an experiment. Qualitative and quantitative data was obtained from the study.

3.7 Data Analysis and Presentation

According to Dillaway, et al., (2017) data analysis is the process of breaking complex information into smaller elements that are easily clarified and understood. Descriptive statistics was used for data analysis. The questionnaires and the experiment were brushed through to ensure all the questions are answered, and the information from interviews was validated.

The cleaned data was coded using SPSS since it's an ideal statistical tool in the analysis of descriptive data. The data was presented in tables and graphs. The data was analyzed using frequencies and percentages. According to (Erlingsson and Brysiewicz, 2017), data analysis is the process of establishing order, structure, and meaning from mass information.

The correlation test and linear regression model was used to assess the influence of ICT on revenue generation and livelihoods of the members of SME-instituted co-operative societies.

The concept of regression is:

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

Where: Y = Operational efficiency of on-demand warehousing

β_0 = Constant Term;

β_1 , β_2 , & β_3 = Beta coefficients;

X1= ICT and Risk Factors

X2= Digital Resource Factors

X3= ICT Motivational Factors

ε = Error term assumed normal and, independent and identically distributed.

3.8 Ethical considerations

O'Leary, (2017) states that it is important to tell the participants that being part of a study is completely voluntary and the results would be referred to anonymously, and there be no intention to harm the study participants. Participation of human subjects in any research should be done cautiously, ensuring they are protected. The study respondents were bound with an ethical measure by ensuring their responses are anonymous. The names and personal information of the respondents were included on any sheet. For the interviews, any tape-recorded information was scrambled using voice scrambling techniques to hide the identity of the interviewee. Participation in the study was voluntary and the respondents were at free will to withdraw at any time they feel like withdrawing.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents the analysis of the collected data on the influence of ICT on revenue generation and livelihoods of the members of SME-instituted co-operative societies, case of selected farmers' co-operative societies in Kiambu County. It gives the response rate in relation to gender, age and duration of member of SME-instituted SACCO.

4.1 Descriptive Statistics

4.1.1 Response Rate

Out of the 200 questionnaires administered to the targeted respondents from SME-instituted co-operative societies in Kiambu County, 187 questionnaires were returned dully filled for analysis. This was considered to be of a great success since it represented 93.50% of the sample size that was selected for the study. The results of response rate are presented in table 4.1 below.

Table 4.2: Response Rate

	Questionnaires	Members of SME-instituted co-operative societies
1	Targeted Respondents	200
2	Forms Filled	187
3	No. of unreachable respondents	13
4	Percentage Response	93.50%

Source: Research data (2019)

4.1.2 Reliability Test

Table 4.3 illustrates the findings of the study concerning the reliability and validity analysis. In this study, reliability and validity were ensured through pilot testing on a sample of 15

respondents. The findings of the pilot study showed that ICT and Risk Factors had a Cronbach's reliability of 0.76, Digital Resource Factors had a reliability alpha value of 0.73, and ICT Motivational Factors had a reliability alpha value of 0.75. From the findings, the Cronbach's reliability was higher than 0.70 thresholds showing that the instrument was sufficiently reliable and valid. This is in support of the study conducted by Frost et al., (2007) which shows that a Cronbach's reliability value of 0.70 indicates that there is sufficient evidence for the reliability and validity of research tools.

Table 4.3: Reliability and Validity Results

Variable	Cronbach's alpha
ICT and Risk Factors	0.76
Digital Resource Factors	0.73
ICT Motivational Factors	0.75

4.1.3 Demographic Analysis

The demographic characteristics of the respondents were analyzed as summarized below.

4.1.3.1 Gender of Respondents

The researcher targeted to establish members of SME-instituted co-operative societies gender of which 75.90% of the respondents were male and 24.10% were female. A sign that more males were members of SME-instituted co-operative societies in Kiambu County as compared to their female counter parts. This is illustrated in the form of a bar graph in table 4.4 as shown below.

This finding gives implication that most of members in SME-instituted SACCO are males.

Table 4.4: Respondents Gender

		Frequency	Percent
Respondents Age	Female	45	24.1
	Male	142	75.9
	Total	187	100.0

Source: Research data (2019)

4.1.3.2 Age of Respondents

Table 4.5 was a cross tabulation of the ages of the respondents. The table shows that 9.1% of the respondents were aged 18-30 years, 33.7% were aged between 31-45 years, 39.0% were aged 46-60 years and 18.2% were aged above 60 years. This implies that members of SME-instituted SACCOs are aged between 31-60 years.

Table 4.5: Age of Respondents

		Frequency	Percent
Age of Respondents	18-30 years	17	9.1
	31-45 years	63	33.7
	46-60 years	73	39.0
	Over 60 years	34	18.2
	Total	187	100.0

Source: Research data (2019)

4.1.3.3 Duration of Existence

The researcher sought to find out the period for which the respondent had been a member of SME-instituted SACCO. At the time of the study, the findings indicated that most of the respondents 47.1% had been members of SME-instituted SACCO for 5-10 years. In addition, 39.6% respondents of the SMEs at the time had been members for a period more than 10 years while the rest of the respondents 13.4% had been in operation for a period less than 5 years. The

findings give an implication that the respondents been members of SME-instituted SACCO for 5-10 years.

Table 4.6: Duration of membership of SME-instituted SACCO

		Frequency	Percent
How long have you been a member of SME-instituted SACCO?	More than 10 Years	74	39.6
	5-10 years	88	47.1
	Less than 5 years	25	13.4
	Total	187	100.0

Source: Research data (2019)

4.1.3.4 Demographic Information of Managers

Results of the demographic information of management team from Githunguri Dairy co-operative society in Kiambu County are presented in table 4.7 below.

Table 4.7: Demographic Information of Managers

		Frequency	Percent
Gender of respondent	Female	1	20.0
	Male	4	80.0
	Total	5	100.0
What is your Age bracket?	18-30 years	4	80.0
	31-45 years	1	20.0
	Total	5	100.0
How long have you worked for your SME-instituted SACCO?	5-10 years	3	60.0
	Less than 5 years	2	40.0
	Total	5	100.0

Table 4.7 demonstrates that among the 5 management team 80.00% were males and 20.00% were females. In regard to age, 80.00% of the management team was aged 18-30 years whereas 20.00% were aged 31-45 years. Lastly, findings show that based on how long the management

team had worked for SME-instituted SACCO, majority 60.00% had worked for 50-10 years while 40.00% managers had only worked for less than 5 years.

4.1.4 ICT and Risk Factors

The first variable examined in this study was ICT risk factors. Questionnaires were formulated to capture views of respondents on ICT risk factors that influence revenue generation and livelihoods of the members of SME-instituted co-operative societies.

Table 4.8: ICT and Risk Factors

Statements		Frequency	Percent
Mobile phones is one of the ICT tools used by cooperative to enhance interaction between the society and it members	Agree	119	63.6
	Disagree	7	3.7
	No Opinion	16	8.6
	Strongly agree	45	24.1
	Total	187	100.0
My revenue and earnings in terms of dividends and bonuses are influenced by risks associated with ICT systems	Agree	100	53.5
	Disagree	14	7.5
	No Opinion	30	16.0
	Strongly agree	41	21.9
	Strongly Disagree	2	1.1
Total	187	100.0	
Forgery of co-operative documentations by ICT experts may affect my income through unauthorized mobile money transfers.	Agree	81	43.3
	Disagree	19	10.2
	No Opinion	49	26.2
	Strongly agree	34	18.2
	Strongly Disagree	4	2.1
Total	187	100.0	
High cost of ICT services adopted by cooperative societies tends to reduce my earnings (income)	Agree	91	48.7
	Disagree	28	15.0
	No Opinion	37	19.8
	Strongly agree	21	11.2
	Strongly Disagree	10	5.3

	Total	187	100.0
Source: Research data (2019)			

Table 4.8 presents results on ICT risk factors that influence revenue generation and livelihoods of the members of SME-instituted co-operative societies. Findings indicated that 63.6% respondents agreed with the statement “Mobile phones is one of the ICT tools used by cooperative to enhance interaction between the society and it members.” Moreover, 3.7% disagreed and 24.1% respondents strongly disagreed with the statement “Mobile phones is one of the ICT tools used by cooperative to enhance interaction between the society and it members.” Moreover, 8.6% respondents expressed that they had no opinion, they could neither agree nor disagree with the statement mobile phones is one of the ICT tools used by cooperative to enhance interaction between the society and it members. The findings depict the importance and significance of mobile phones an ICT tools that help in reducing risks associated with handling cash. This is in support of a study conducted by Björkegren and Grissen, (2018) who stated that mobile phone usage helps in managing risks related to default in loan repayment.

In regard to the statement “My revenue and earnings in terms of dividends and bonuses are influenced by risks associated with ICT systems,” findings indicated that 53.5% respondents agreed while 21.9% strongly agreed that their revenue and earnings in terms of dividends and bonuses are influenced by risks associated with ICT systems. In contrary, 1.1% strongly disagreed whereas 7.5% respondents just disagreed that their revenue and earnings in terms of dividends and bonuses are influenced by risks associated with ICT systems. However, 16.0% respondents had no opinion whether revenue and earnings in terms of dividends and bonuses are influenced by risks associated with ICT systems. Study findings were in support of Graham, et

al., (2017) study who indicated that risks that occur as a result of technological advance always have impact on the livelihood of every member of the affected organization.

Moreover, results indicated that 18.2% respondents strongly agreed while 43.3% just agreed that forgery of co-operative documentations by ICT experts may affect my income through unauthorized mobile money transfers. Furthermore, 10.2% respondents disagreed, 2.1% strongly disagreed whereas 26.2% respondents had no opinion that forgery of co-operative documentations by ICT experts may affect my income through unauthorized mobile money transfers. According to Meyliana, et al., (2019) use of technology has recently promoted forgery of documentation and this to a great extent give leeway to unauthorized transfers hence affecting organizational members.

Lastly, based on the statement “High cost of ICT services adopted by cooperative societies tends to reduce my earnings (income)” majority 48.7% respondents agreed followed by 19.8% respondents who had no opinion while 15.0% respondents disagreed with the statement. However, 11.2% respondents strongly agreed while 5.3% strongly disagreed that high cost of ICT services adopted by cooperative societies tends to reduce my earnings (income). This finding gives an implication that the higher the cost for adopting new technologies, the lower revenue generation in the short run. This has tendency to reduce employees earning. However, Yunis, Tarhini, and Kassar, (2018) finding contradicts this finding since it states that technological adoption mainly promotes organizational performance and revenue generation.

4.1.5 Digital Resource Factors

The second objective examined in this study was Digital Resource Factors. Questionnaires were formulated to capture views of respondents on digital resource factors that influence revenue generation and livelihoods of the members of SME-instituted co-operative societies.

Table 4.9: Digital Resource Factors

		Frequency	Percent
Do Digital Resource Factors make ICT utilization affordable to you and other members of co-operative society?	Agree	111	59.3
	Disagree	13	7.0
	Neutral	37	19.8
	Strongly Agree	23	12.3
	Strongly Disagree	3	1.6
	Total	187	100.0
Do you agree that Digital Resource Factors promotes convenience and efficiency in running cooperative societies for enhanced service delivery?	Agree	109	58.3
	Disagree	8	4.3
	Neutral	39	20.9
	Strongly Agree	31	16.6
	Total	187	100.0
Do you consider Digital Resource Factors as a reliable ICT platform utilized by Dairy cooperative societies?	Agree	88	47.1
	Disagree	14	7.5
	Neutral	51	27.3
	Strongly Agree	33	17.6
	Strongly Disagree	1	.5
	Total	187	100.0
Digital Resource Factors promotes my access to and ease payment of my bonuses and dividends.	Agree	82	43.9
	Disagree	20	10.7
	Neutral	52	27.8
	Strongly Agree	28	15.0
	Strongly Disagree	5	2.7
	Total	187	100.0
	Agree	94	50.3
	Disagree	15	8.0

Do Digital Resource Factors speed processes of accessing financial assistance for you?	Neutral	51	27.3
	Strongly Agree	22	11.8
	Strongly Disagree	5	2.7
	Total	187	100.0

Source: Research data (2019)

Table 4.9 presents results on Digital Resource Factors and how they influence members' of SMEs-instituted co-operatives societies' livelihood and revenue generation in Kiambu County. Findings indicated that 59.3% and 1.6% respondents agreed and strongly agreed respectively with the statement "Digital Resource Factors make ICT utilization affordable to you and other members of co-operative society." Moreover, 12.3% and 7.0% respondents strongly disagreed and disagreed respectively with the question "Digital Resource Factors make ICT utilization affordable to you and other members of co-operative society?," However, 19.8% respondents expressed that they were neutral to the statement Digital Resource Factors make ICT utilization affordable to you and other members of co-operative society. This finding gives an implication that ICT utilization makes accessibility of SME instituted SACCOS cheaper and easy to access.

Secondly, with regard to question "Do you agree that Digital Resource Factors promotes convenience and efficiency in running cooperative societies for enhanced service delivery?," findings indicated that 16.6% respondents strongly agreed and 58.3% just agreed that Digital Resource Factors promotes convenience and efficiency in running cooperative societies for enhanced service delivery. In contrary, 4.3% respondents just disagreed that Digital Resource Factors promotes convenience and efficiency in running cooperative societies for enhanced service delivery. Finding was in support of Sunday and Vera, (2018) study which established that

in the contemporary world, ICT simplifies work and for any organization to succeed, it must adopt the right ICT tool.

Moreover, with regard to the question “Do you consider Digital Resource Factors as a reliable ICT platform utilized by Dairy cooperative societies?,” results indicated that 17.6% respondents strongly agreed while 47.1% just agreed that they consider Digital Resource Factors as a reliable ICT platform utilized by Dairy cooperative societies?. Furthermore, 7.5% respondents disagreed whereas 0.5% respondents strongly disagreed that Digital Resource Factors are reliable ICT platform utilized by Dairy cooperative societies. Lastly, 27.3% respondents gave neutral views that Digital Resource Factors as a reliable ICT platform utilized by Dairy cooperative societies. Study findings contradict Kabiawu, van Belle, and Adeyeye, (2016) who observed that ICT is not reliable because it can lead to ease of loss of vital data if not well used.

In addition, with regard to the statement “Digital Resource Factors promotes my access to and ease payment of my bonuses and dividends, 43.9% respondents just agreed while 15.0% respondents expressed that they strongly agreed. Furthermore, 10.7% respondents disagreed that Digital Resource Factors promotes my access to and ease payment of my bonuses and dividends. However, 2.7% respondents strongly disagreed whereas 27.8% were neutral in giving their view. The study results imply that through ICT adoption, payment of members’ dues can be facilitated thus make them to receive their dividends and loan processing faster.

Lastly, based on the question “Do Digital Resource Factors speed processes of accessing financial assistance for you?,” 50.3% respondents just agreed followed by 11.8% respondents who strongly agreed that Digital Resource Factors speed process of accessing financial

assistance for them. However, 8.0% respondents just disagreed while 2.7% strongly disagreed that Digital Resource Factors speed process of accessing financial assistance for them. Find was in support of the study conducted by Demirguc-Kunt, Klapper, and Singer, (2017) which indicated that access to loans from financial institutions can be faster when the right ICT is adopted.

4.1.6 ICT Motivational Factors

The third objective examined in this study was ICT Motivational Factors. Questionnaires were formulated to capture views of respondents on ICT Motivational Factors that influence revenue generation and livelihoods of the members of SME-instituted co-operative societies.

Table 4.10: ICT Motivational Factors

		Frequency	Percent
I access information about my bonuses or dividends on the co-operative ICT platforms	Agree	109	58.3
	Disagree	10	5.3
	Neutral	34	18.2
	Strongly agree	20	10.7
	Strongly disagree	14	7.5
	Total	187	100.0
I find access to my financial information on the co-operatives ICT platforms timely.	Agree	86	46.0
	Disagree	14	7.5
	Neutral	46	24.6
	Strongly agree	29	15.5
	Strongly disagree	12	6.4
	Total	187	100.0
I monitor revenues for my produce delivered to the co-operative using the ICT platforms	Agree	74	39.6
	Disagree	22	11.8
	Neutral	14	7.5
	Strongly agree	39	20.9
	Strongly disagree	38	20.3

	Total	187	100.0
I use the financial information which is readily available through the ICT platforms to make decisions on my financial management including investments decisions.	Agree	88	47.1
	Disagree	14	7.5
	Neutral	48	25.7
	Strongly agree	21	11.2
	Strongly disagree	16	8.6
	Total	187	100.0

Source: Research data (2019)

Table 4.10 presents results on ICT Motivational Factors. Findings indicated that majority 7.5% and 5.3% respondents strongly disagreed and disagreed respectively with the statement “I access information about my bonuses or dividends on the co-operative ICT platforms.” Moreover, 58.3% and 10.7% respondents agreed and strongly disagreed respectively with the statement “I access information about my bonuses or dividends on the co-operative ICT platforms.” However, 18.2% respondents expressed that they were neutral, could neither agree nor disagree with the statement I access information about my bonuses or dividends on the co-operative ICT platform.

Secondly, with regard to the statement “I find access to my financial information on the co-operatives ICT platforms timely, 6.4% strongly disagreed whereas 7.5% respondents just disagreed. Moreover, 46.0% of respondents and 15.5% respondents agreed and strongly agreed respectively with the statement that they find access to my financial information on the co-operatives ICT platforms timely. In contrary 24.6% respondents indicated that they were neutral as far as access to my financial information on the co-operatives ICT platforms timely is concerned. Generally, ICT enhance access to loans and other financial services.

Moreover, results indicated that with regard to “I monitor revenues for my produce delivered to the co-operative using the ICT platforms,” 20.9% respondents strongly agreed while 39.6% just

agreed that they monitor revenues for their produce delivered to the co-operative using the ICT platforms. Furthermore, 20.3% respondents strongly disagreed whereas 7.5% respondents said they had neutral opinion on monitor revenues for their produce delivered to the co-operative using the ICT platforms.

Lastly, based on the statement, “I use the financial information which is readily available through the ICT platforms to make decisions on my financial management including investments decisions” majority 47.1% respondents agreed while followed by 11.2% who strongly disagreed that they use the financial information which is readily available through the ICT platforms to make decisions on my financial management including investments decisions. However, 7.5% respondents just disagreed while 8.6% respondents strongly disagreed that they use the financial information which is readily available through the ICT platforms to make decisions on my financial management including investments decisions. Lastly, 25.7% respondents indicated that they had neutral opinion.

4.1.7 Influence of ICT on Livelihood and Revenue Strategies

The third variable examined in this study was ICT Motivational Factors. Questionnaires were formulated to capture views of respondents on ICT Motivational Factors that influence revenue generation and livelihoods of the members of SME-instituted co-operative societies.

Table 4. 11: Influence of ICT on Livelihood and Revenue Strategies

		Frequency	Percent
ICT platforms result to social stratification and classification among the co-operative members.	Agree	104	55.6
	Disagree	18	9.6
	Neutral	33	17.6
	Strongly Agree	8	4.3
	Strongly Disagree	24	12.8
	Total	187	100.0
ICT platforms in co-operative societies improve my financial capital and financial well-being by increasing my revenue generation (income).	Agree	91	48.7
	Disagree	11	5.9
	Neutral	63	33.7
	Strongly Agree	15	8.0
	Strongly Disagree	7	3.7
	Total	187	100.0
ICT platforms used by co-operative society's eases my access to credit or loan.	Agree	72	38.5
	Disagree	30	16.0
	Neutral	54	28.9
	Strongly Agree	26	13.9
	Strongly Disagree	5	2.7
	Total	187	100.0
I can learn more on modern farming techniques from ICT platforms available in cooperative societies.	Agree	75	40.1
	Disagree	27	14.4
	Neutral	58	31.0
	Strongly Agree	18	9.6
	Strongly Disagree	9	4.8
	Total	187	100.0
ICT platforms are avenues where I can access and learn Post-harvest handling Techniques thus minimize wastages brought about by poor post-harvest handling techniques.	Agree	98	52.4
	Disagree	16	8.6
	Neutral	51	27.3
	Strongly Agree	15	8.0
	Strongly Disagree	7	3.7
	Total	187	100.0

Table 4.11 presents results on the influence of ICT on Livelihood and Revenue Generation among members of SME-instituted co-operative societies in Kiambu County. Findings indicated that 55.6% and 4.3% respondents agreed and strongly disagreed respectively with the statement “ICT platforms result to social stratification and classification among the co-operative members.” Moreover, 9.6% and 12.8% respondents strongly disagreed and disagreed respectively with the statement “ICT platforms result to social stratification and classification among the co-operative members.” However, 17.6% respondents expressed that they had no opinion.

Secondly, with regard to the statement “ICT platforms in co-operative societies improve my financial capital and financial well-being by increasing my revenue generation (income),” results indicated that 48.7% just agreed while 8.0% respondents strongly agreed that there is clarity on presumptive tax system. In contrary, 3.7% strongly disagreed whereas 5.9% respondents just disagreed that ICT platforms in co-operative societies improve their financial capital and financial well-being by increasing their revenue generation (income).

Moreover, results indicated that 13.9% respondents strongly agreed while 38.5% just agreed that ICT platforms used by co-operative society’s eases my access to credit or loan. Furthermore, 16.0% respondents strongly disagreed whereas 2.7% respondents disagreed that ICT platforms used by co-operative society’s eases my access to credit or loan. However, 28.9% respondents were neutral in giving their views. According to Sharma, (2019) any financial institute that fails to embrace technology offers sub-standard service thus deters people from loan access.

In addition, with regard to the statement “I can learn more on modern farming techniques from ICT platforms available in cooperative societies,” 40.1% of the respondents just agreed while 9.6% expressed that they strongly agreed with the statement. Findings thus implied that through ICT, members of Dairy SACCOS can easily learn about the 21 century farming techniques. Furthermore, 4.8% respondents strongly disagreed while 14.4% disagreed that they can learn more on modern farming techniques from ICT platforms available in cooperative societies. However, 31.0% respondents expressed neutrality to the statement “I can learn more on modern farming techniques from ICT platforms available in cooperative societies.”

Lastly, based on the statement “ICT platforms are avenues where I can access and learn Post-harvest handling Techniques thus minimize wastages brought about by poor post-harvest handling techniques,” 27.3% respondents gave a neutral response. In addition, 52.4% respondents just agreed while 8.0% strongly agreed that ICT platforms are avenues which they can access and learn Post-harvest handling Techniques thus minimize wastages brought about by poor post-harvest handling technique. The outcome was in support of Patel, (2019) that established that wastage at work places is best managed by ICT. However, 8.6% respondents just disagreed while 3.7% strongly disagreed that ICT platforms are avenues where I can access and learn Post-harvest handling Techniques thus minimize wastages brought about by poor post-harvest handling technique.

4.1.8 Qualitative Analysis for Co-operative Society Managers

Qualitative data were collected from 5 members of Githunguri Dairy co-operative management team. The data were analyzed using narrative and thematic approach. With regard to what incentives can encourage co-operative society's management to adopt ICT tools? Responses from interviews were recorded and analyzed as shown in the excerpt below. Most of the managers said that factors that play a key role as incentives in encouraging co-operative society's management to adopt ICT tools are accurate recording of the member's produce, adopting a community extension approach to teach the members on the importance of various ICT tools in production and the use of an application that directly engages the management and the members of the society. Moreover, other factors that serve as incentives are tracking member produce from the collection center to the main collection point and using the SMS platform to notify members of the produce delivered rather than the printed receipts.”

Based on how Digital Resource factors make ICT utilization affordable management members of co-operative society, managers indicated that digital resource factors enable members to get a response as soon as possible on submitting a question or an issue on their account and getting free updates on new milk market rates. This makes make ICT utilization affordable to members of co-operative society.

Majority of the managers expressed that through sending members their financial data for free, inclusive of the payments for a month's produce, less cost is incurred by both members and the SACCO. ICT also makes it easier for the production methods to be easily accessed from the websites and other audio visuals by the management. Furthermore, digital resource factors

enable members to inquire, balance and constantly check on the produce they deliver to the society. Lastly, the toll-free numbers allow members to call for inquiries with no extra charges.

Most of the managers indicated that the ICT utilization promotes knowledge about an asset base of co-operative societies and thus increases their performance. This occurs when members are trained on quality production which results in better market prices. Furthermore, members of the community are trained on improving their production; this is expanding the membership of the society, thus increased liquid assets in membership fees. However, Managers 02, said that *“ICT utilization promotes knowledge promote new markets are explored and utilized by the management, new markets have been explored by the management which is increasing the assets of the society and last there is a better understanding of the distribution systems and the policy mechanisms. For instance, the right policies have increased the membership of the society.”*

With regard to reliability of ICT in the recording and marketing of members produce, a number of managers indicated that through ICT, members can easily accesses credit facilities based on their produce. The management has been cutting costs by accurately utilizing market information. The set strategies are accurate and very reliable in the real time recording of members produce at milk collection points. Last but not least, adopted ICT enhances accuracy, with a member knowing the accurate produce they deliver to the society at any given time and at the collection points.

Regarding how ICT tools in co-operative societies increasing capital resources in spite of costs and risks, manager 003 said that, *“.....ICT tools in co-operative societies increases capital*

resources through free transfer of money, especially the credit facilities offered to members. Members can also access credit facilities from the society at no extra costs, with the mere verification of membership details. In addition, ICT tools can facilitate payment of members through banks and other financial institutions, which reduces the risk for fraud. There is improved flow of data, which is reducing costs on data analysis. They allow for a healthy negotiation for the right market prices.”

Based on how ICT automated payment systems of dividends and shares impact the livelihood of the members, the co-operative societies’ management, said that ICT plays a critical role in speeding members’ payment through mobile money platforms. Members can sell their Shares and receive their money in three working days. ICT also create positive impact as there is a real time payment of dividends and member produce. Moreover, ICT promotes convenience and ease in reconciliation of payment thus there is fast payment of services.

Regarding how adopted ICT platforms led to social stratification and classes among the members of cooperative societies, most of the managers said that the adopted ICT platforms led to high social stratification and classes among the members of cooperative societies.

Regarding the perception of cooperative management on the staff ICT proficiency requirements, manager 01 indicated that “*....many of the staff have adequate skills required in the recording of member produce. They also think that ICT staffs are highly trained to ensure minimal risks on ICT forgery. Management team also thinks that the staffs are well trained with a high staff population being the young people. They are very highly trained and efficient.”*

The management team also indicated that ICT is viewed as strategic resources in its day-to-day operations because ICT allows managers to balance and deliver accurate and quality produce to the consumers. Through ICT, members' shares can be transferred from one member to another with the right documentation. The management can also use ICT to easily train and monitor how the members are. Through, ICT the management has ensured all data after a day is recorded to ensure accuracy of data. The management is well versed in accurate service delivery to all members regardless of their geographic locality.

4.2 Inferential Statistics

4.2.1 Correlation Analysis

The study sought to establish the relationship between ICT and its influence on revenue generation and livelihoods of the members of SME-instituted co-operative societies Kiambu County. Pearson Correlation analysis was used to achieve this at 95% confidence levels. The correlation analysis enabled the testing of study's hypotheses that ICT has a significant effect on revenue generation of members of cooperative societies.

Table 4.12 illustrates significant, positive, and relatively strong linear relationships between Revenue Generation and Livelihoods and: ICT and Risk Factors ($R = 0.58$); Digital Resource Factors ($R = 0.55$) and ICT Motivational Factors ($R = 0.60$). The hypothesis stated that ICT utilization has no influence on revenue generation of members of cooperative societies. The study established a positive coefficient significant at $\alpha=5\%$. Thus, the null hypothesis is rejected. This implies that an increase in utilization of ICT increase revenue generation and livelihood of members of cooperative societies.

Table 4.12: Correlation Analysis

	ICT and Risk Factors	Digital Resource Factors	ICT Motivational Factors	Revenue Generation and Livelihoods
ICT and Risk Factors	1.00			
Digital Resource Factors	0.55	1.00		
ICT Motivational Factors	0.54	0.60	1.00	
Revenue Generation and Livelihoods	0.58	0.55	0.60	1.00

4.2.2 Regression Analysis**Table 4.13: Regression Coefficients**

	Un-standardized Co-efficient		Standardized Co-efficient	t	Sig
	B	Std Error	Beta		
(Constant)	12.342	0.432		3.114	0.026
ICT and Risk Factors	0.512	0.253	0.045	1.354	0.044
Digital Resource Factors	0.343	0.432	0.052	1.531	0.037
ICT Motivational Factors	0.299	0.512	0.076	1.437	0.032

Source: Research Finding

The study model will therefore be;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Revenue Generation and Livelihoods = 12.342+ 0.512 (ICT and Risk Factors) + 0.343 (Digital Resource Factors) + 0.299 (ICT Motivational Factors)

According to the regression equation established, taking all factors into account (ICT and Risk Factors), Digital Resource Factors and ICT Motivational Factors will be 12.342. The

Standardized Beta Coefficients give a measure of the contribution of each variable to the model. A large value indicates that a unit change in this predictor variable has a large effect on the criterion variable.

The t and Sig (p) values give a rough indication of the impact of each predictor variable – a big absolute t value and small p value suggests that a predictor variable is having a large impact on the criterion variable. At 5% level of significance and 95% level of confidence, ICT and Risk Factors had a 0.044 level of significance; Digital Resource Factors had a 0.037 level of significance and ICT Motivational Factors had a 0.032 level of significance.

4.2.3 Interpretations of the Inferential Statistics

A positive coefficient was established between ICT and Risk Factors and revenue generation and livelihoods of the members of SME-instituted co-operative societies. This implies that a unit increase in ICT and Risk Factors leads to 0.512 units increase in revenue generation and livelihoods of the members of SME-instituted co-operative societies. Otii, et al., (2020) contends that adoption of ICT result to the improvement in service delivery, thus resulting into increased revenue generation and livelihood improvement.

Digital Resource Factors has positive influence on revenue generation and livelihoods of the members of SME-instituted co-operative societies. A unit increase in the Digital Resource Factors utilization results to 0.343 units increase in revenue generation and livelihoods of the members of SME-instituted co-operative societies. Bett, (2018) observed that SACCOs that

adopt ICT perform well hence meet the needs of their members. As a result, members can access financial resources which help them generate more income and improve their livelihood.

The ICT Motivational Factors has a positive influence on revenue generation and livelihoods of the members of SME-instituted co-operative societies. A unit increase in ICT Motivational Factors will lead to 0.299 units increase in the revenue generation and livelihood of SME-instituted SACCO members. With increase in CT motivational factors, members also increased their access to bonuses or dividends and financial on the co-operative ICT platforms.

4.3 Discussion

4.3.1 ICT and Risk Factors

The first variable examined in this study was ICT risk factors. The study established that mobile phones is one of the ICT tools used by cooperative societies to enhance interaction between the society and its members. The ICT tools adopted by Dairy co-operative SACCOS tend to influence revenue and earnings in terms of dividends and bonuses that ought to be earned by SACCO members. This finding was in support of Langat, (2016) study on Imarisha Sacco, which established that ICT platforms greatly influence savings and credit cooperative societies' products on members' livelihoods.

Furthermore, study findings show that forgery of co-operative documentations by ICT experts may affect members' income through unauthorized mobile money transfers. This finding concurred with Njue, and Mbogo, (2017) who argued that falsification documentations is risky and serves to limit access to funds from well-established financial institutions such as banks. Lastly, it was established that when the cost of ICT services adopted by cooperative societies is

high, the earnings of members drastically go down. The study findings implied that ICT tools are critical in enhancing operations of Dairy co-operative SACCOS. However, members perceive it to be associated with unforeseen risks that can affect their earnings and access to loans.

4.3.2 Digital Resource Factors

The second factor examined in this study was Digital Resource Factors and how they influence members of SMEs-instituted co-operatives societies' livelihood and revenue generation in Kiambu County. The study established that Digital Resource Factors make ICT utilization affordable to members of co-operative society and they promote convenience and efficiency in running cooperative societies for enhanced service delivery.

The study also established that Digital Resource Factors is a reliable ICT platform utilized by Dairy cooperative societies. The also determined that majority of farmers indicated that Digital Resource Factors promotes their access to and ease payment of bonuses and dividends as well as speeding processes of accessing financial assistance for you. These findings concurred with Yebowaah, and Plockey, (2017) observed that Digital Resources are critical in any organization ranging from academic sectors to business sectors in promoting their operations. Quan-Haase, Martin, and Schreurs, (2016) also indicated that digital resource are used in a daily basis in the cooperate world.

4.3.3 ICT Motivational Factors

The study also examined the ICT motivational factors and how they influence revenue generation and livelihoods of the members of SME-instituted co-operative societies. The study established that access to information on bonuses or dividends on the co-operative ICT platforms, timely access to financial information on the co-operatives ICT platforms, ease of monitoring revenues for produce delivered to the co-operative using the ICT platforms as well as the use financial information which is readily available through the ICT platforms.

This makes decisions on financial management to be key motivational factors to ICT adoption by Dairy co-operative societies. This gives an implication that the benefits accrued from ICT adoption by Dairy co-operative societies are motivation factors both to management and farmers.

Other studies such as (Acharya, 2016; Senkbeil, and Ihme, 2017) also indicate that what motivates users to adopt and use ICT is that ICT is becoming more essential and easy to use by private and vocational participation in society. Acharya, (2016) also indicates that motivational facets play an important role in developing ICT knowledge and skills.

4.3.4 Influence of ICT on Livelihood and Revenue Strategies

The fourth variable examined in this study was the influence of ICT on revenue generation and livelihoods of the members of SME-instituted co-operative societies. The study established that; ICT platforms result to social stratification and classification among the co-operative members; improve financial capital and financial well-being by increasing members' revenue generation. Similarly, studies by Sharma, (2019) indicate that all financial institutions that do not adopt technology always offer sub-standard service thus deter people from accessing services.

Furthermore, it was established that ICT platforms used by co-operative society's eases members access to credit or loan as well as learning more on modern farming techniques from ICT platforms available in cooperative societies. Lastly, most of farmers use ICT platforms as avenues where they can access and learn Post-harvest handling Techniques thus minimize wastages brought about by poor post-harvest handling techniques. The finding supported (Jacob, 2016) study who indicated that the SMS-based electronic money transfer system has changed the lives of millions of Kenyans, including rural poor people. This is done in Kenya through M-PESA which makes direct transfers to those living in remote areas miles away from traditional commercial banks.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The purpose of this chapter is to give the summary of the findings, conclusions and recommendations of the study. This was based on the research findings that is presented and discussed in the previous chapters. The study established several findings which make a direct contribution to knowledge and policy formulation. Recommendations both for further research as well as policy and practice have been made.

5.2 Summary of the Findings

This study aimed at examining the influence of ICT on revenue generation and livelihoods of the members of SME-instituted co-operative societies among selected farmers' co-operative societies in Kiambu County. The task was to; examine the extent to which adopted ICT techniques by select Dairy Co-operative Societies influence member access and diversification of resources for revenue generation and to examine how ICT platforms, and the impact of the revenue generations and livelihoods of individual members in the cooperative societies in Kiambu County. The study reviewed previous studies to establish academic gaps which the present study sought to bridge. This was done through library research.

This study adopted a descriptive survey design and employed both quantitative and qualitative research as the approach to direct the study. The study focused on members of Dairy Co-operative Societies and management team. The questionnaires and interview schedules were used as instruments for data collection. Expert opinion was sought on validity of the instruments.

Data analysis was started immediately after the field. Data was summarized into frequencies and percentages and presented in tables and charts and figures. This section comprises of discussions based on the specific research objectives of the study.

With regard to the first objective, the ICT tools adopted by Dairy co-operative SACCOS tend to influence revenue and earnings in terms of dividends and bonuses that ought to be earned by SACCO members. Study findings showed that forgery of co-operative documentations by ICT experts may affect members' income through unauthorized mobile money transfers. The study findings implied that ICT tools are critical in enhancing operations of Dairy co-operative SACCOS.

Secondly, study objective indicated that Digital Resource Factors make ICT utilization affordable to members of co-operative society, they are reliable and can promote convenience and efficiency in running cooperative societies for enhanced service delivery. Thirdly, the study established that access to information on bonuses or dividends on the co-operative ICT platforms, timely access to financial information on the co-operatives ICT platforms, ease of monitoring revenues for produce delivered to the co-operative using the ICT platforms as well as the use financial information which is readily available through the ICT platforms.

Lastly, on the influence of ICT on revenue generation and livelihoods of the members of SME-instituted co-operative societies. The study established that; ICT platforms result to social stratification and classification among the co-operative members; improve financial capital and financial well-being by increasing members' revenue generation.

5.3 Conclusion and Recommendation

5.3.1 Conclusion

The conclusions drawn were based on the results of the entire study. First and foremost, there are various ICT factors that determine the success of adoption of ICT platforms by Dairy co-operative societies in Kiambu County. The ICT platforms adopted by Dairy co-operative SACCOS tend to influence revenue and earnings in terms of dividends and bonuses that ought to be earned by SACCO members. They can easily be manipulated by experts hence create room for forgery of co-operative documentations by ICT experts. This may affect members' income through unauthorized mobile money transfers. The study concluded that when the cost of ICT services adopted by cooperative societies is high, the earnings of members drastically go down. Nonetheless, ICT platforms used by co-operative society's eases members access to credit or loan as well as learning more on modern farming techniques from ICT platforms available in cooperative societies. ICT platforms also creates an avenue where farmers can access and learn Post-harvest handling Techniques thus minimize wastages brought about by poor post-harvest handling techniques.

5.3.2 Recommendation

From the findings I recommend;

- i. There is need for the management of dairy cooperatives to communicate the usefulness of ICT adoption and ease of use to its staff and members. This will play a big role in enhancing performance improvement.

- ii. The top management support in regard to ICT opportunity development. Support by management leads to proper financing for ICT technologies and approvals of staff trainings for ICT, as well as creating awareness of perceived usefulness of ICT to staff and members.
- iii. The management of dairy cooperatives needs to recruit and train their employees in a bid to motivate them to embrace and use modern ICT platforms to benefit the most from the implemented ICT.
- iv. The for enough financing to be availed to dairy cooperatives in Kenya to enable them to afford and adopt modern technologies, the government needs to ensure evenly distribution of robust ICT infrastructure across the country to all towns so as to reduce the cost of ICT adoption and access.

5.4 Areas for Further Research

This study sought to assess the influence of ICT on revenue generation and livelihoods of the members of SME-instituted co-operative societies in Kiambu County in an attempt to bridge the gap in knowledge that existed. Although the study attained these, it mainly focused on one County, which is Kiambu County. There is need to conduct a similar study in other counties and other cooperative societies in different sectors such as savings and credit, investments, marketing, other agricultural societies and attempt to compare the findings. There is also a need to conduct a study on the challenges facing adoption of ICT solutions in Kenya to establish how performance of the cooperatives is influenced by ICT platforms.

REFERENCES

- Acharya, B. B. (2016). A Systematic Literature Review on Immigrants' Motivation for ICT Adoption and Use. *International Journal of E-Adoption (IJEA)*, 8(2), 34-55.
- Ahabyoona, F., Lubega, J. T., & Kibukamusoke, M. (2019). Information Communication Technology for enhanced credit facilitation decisions for Agricultural Cooperatives in Uganda. *International Journal of Technology and Management*, 4(1), 22-22.
- Arias, M., Carreño, S., & Chaparro, L. (2018). Validity and Reliability of the Scale, Role Taking in Caregivers of People with Chronic Disease, ROL. *International Archives of Medicine*, 11.
- Atmowardoyo, H. (2018). Research methods in TEFL studies: Descriptive research, case study, error analysis, and R & D. *Journal of Language Teaching and Research*, 9(1), 197-204.
- Bearman, M. (2019). Focus on Methodology: Eliciting rich data: A practical approach to writing semi-structured interview schedules. *Focus on Health Professional Education: A Multi-Professional Journal*, 20(3), 1-11.
- Belay, D. (2018). *Social Capital and Smallholder Farmers' Collective action: the Case of Primary Dairy Cooperatives in West Shoa Zone, Ethiopia* (Doctoral dissertation, Addis Ababa University).
- Bent, B. B. (2019). The Impact of Microfinance on Poverty Reduction and Women Empowerment. In *Rais Collective Volume—Economic Science* (pp. 72-86). Scientia Moralitas Research Institute.
- Bett, M. C. (2018). *Digital Disruption in the Financial Service Industry: A Case of Afya Sacco in Kenya* (Doctoral dissertation, United States International University-Africa).

- Bijman, J., & Hanisch, M. (2018). Living apart together: How are member–cooperative relationships changing within European dairy cooperatives?. *Berlin Cooperative Papers*, 71.
- Björkegren, D., & Grissen, D. (2018). Behavior revealed in mobile phone usage predicts loan repayment. *Available at SSRN 2611775*.
- Brusov, P., Filatova, T., Orekhova, N., & Eskinardov, M. (2018). Modern Theory of Capital Cost and Capital Structure: Brusov–Filatova–Orekhova Theory (BFO Theory). In *Modern Corporate Finance, Investments, Taxation and Ratings* (pp. 29-50). Springer, Cham.
- Chagwiza, C., Muradian, R., & Ruben, R. (2016). Cooperative membership and dairy performance among smallholders in Ethiopia. *Food Policy*, 59, 165-173.
- Chatterjee, S., Sarker, S., & Siponen, M. (2017). How do mobile ICTs enable organizational fluidity: toward a theoretical framework. *Information & Management*, 54(1), 1-13.
- Chelangat, B. L., & Namusonge, M. (2018). Savings mobilization strategies and the growth of savings and credit cooperative societies in Nairobi City County, Kenya. *International Academic Journal of Human Resource and Business Administration*, 3(2), 48-78.
- Chepkwei, A. K., Wanyoike, D., & Koima, J. (2017). Influence of Strategic Leadership on Effective Strategy Implementation among Savings and Credit Co-Operative Societies in Kenya. *European Journal of Business and Strategic Management*, 2(9), 55-70.
- Chlebicka, A., & Pietrzak, M. (2018). Size of membership and survival patterns of producers' organizations in agriculture—Social aspects based on evidence from Poland. *Sustainability*, 10(7), 2293.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

- Demirguc-Kunt, A., Klapper, L., & Singer, D. (2017). *Financial inclusion and inclusive growth: A review of recent empirical evidence*. The World Bank.
- Dillaway, H., Lysack, C., & Luborsky, M. R. (2017). Qualitative approaches to interpreting and reporting data. *Kielhofner's research in occupational therapy: Methods of inquiry for enhancing practice*, 228.
- Draper, P., Engel, J., Krogman, H., Ngarachu, A., & Wentworth, L. (2018). *Between Gatekeeper and Gateway: Taking Advantage of Regional and Global Value Chains by Addressing Barriers to South Africa's Trade Competitiveness*. World Bank.
- El Kadiri, S., Grabot, B., Thoben, K. D., Hribernik, K., Emmanouilidis, C., Von Cieminski, G., & Kiritsis, D. (2016). Current trends on ICT technologies for enterprise information systems. *Computers in Industry*, 79, 14-33.
- Englund, C., Chen, L., Ploeg, J., Semsar-Kazerooni, E., Voronov, A., Bengtsson, H. H., & Didoff, J. (2016). The grand cooperative driving challenge 2016: boosting the introduction of cooperative automated vehicles. *IEEE Wireless Communications*, 23(4), 146-152.
- Erlingsson, C., & Brysiewicz, P. (2017). A hands-on guide to doing content analysis. *African Journal of Emergency Medicine*, 7(3), 93-99.
- Evans, S. K., Pearce, K. E., Vitak, J., & Treem, J. W. (2017). Explicating affordances: A conceptual framework for understanding affordances in communication research. *Journal of Computer-Mediated Communication*, 22(1), 35-52.
- Feather, C., & Meme, C. K. (2019). Strengthening housing finance in emerging markets: the savings and credit cooperative organisation (SACCO) model in Kenya. *Housing Studies*, 34(9), 1485-1520.

- George, R. P. (2019). *Unlocking small-scale fisheries value chains through Information & Communication Technology (ICT)-the case studies of Lamberts Bay & Kleinmond, South Africa* (Doctoral dissertation, Faculty of Science).
- Gilmore Onsongo, E. (2019). Institutional entrepreneurship and social innovation at the base of the pyramid: the case of M-Pesa in Kenya. *Industry and Innovation*, 26(4), 369-390.
- Gitau, B. N. (2019). Influence of credit management on financial performance of dairy marketing cooperatives in Kenya. *The Strategic Journal of Business & Change Management*, 6(3), 227-236.
- Godfrey, L., Muswema, A., Strydom, W., Mamafa, T., & Mapako, M. (2017). Co-operatives as a development mechanism to support job creation and sustainable waste management in South Africa. *Sustainability Science*, 12(5), 799-812.
- Graham, M., Hjorth, I., & Lehdonvirta, V. (2017). Digital labour and development: impacts of global digital labour platforms and the gig economy on worker livelihoods. *Transfer: European Review of Labour and Research*, 23(2), 135-162.
- Gweyi, M. O. (2018). *Influence of Financial Risk on Financial Performance of Deposit Taking Savings and Credit Co-operatives in Kenya* (Doctoral dissertation, JKUAT-COHRED).
- Huang, L. T. (2016). Flow and social capital theory in online impulse buying. *Journal of Business Research*, 69(6), 2277-2283.
- Huda, M., Qodriah, S. L., Rismayadi, B., Hananto, A., Kardiyati, E. N., Ruskam, A., & Nasir, B. M. (2019). Towards cooperative with competitive alliance: insights into performance value in social entrepreneurship. In *Creating business value and competitive advantage with social entrepreneurship* (pp. 294-317). IGI Global.

- Ireri, K. D., & Idowu, A. (2017). Investigation of Effectiveness Of Information Technology On The Operations Of The Savings And Credit Cooperative Societies In Nairobi, Kenya. *International Journal of Finance and Accounting*, 2(1), 1-18.
- Ivey, J. (2016). Is descriptive research worth doing?. *Pediatric nursing*, 42(4), 189.
- Jacob, F. (2016). The role of M-Pesa in Kenya's economic and political development. In *Kenya After 50* (pp. 89-100). Palgrave Macmillan, New York.
- Jain, C., & Prasad, N. (2018). Secondary Education: Sampling Procedure and Design. In *Quality of Secondary Education in India* (pp. 39-49). Springer, Singapore.
- Jeločnik, M., Kovačević, V., & Subić, J. (2017). Co-Operatives as an Element of Entrepreneurship Development in Serbian Agriculture.
- Joseph, K. K. (2018). *Determinants of Financial Performance of Agricultural Cooperative Societies in Baringo County, Kenya* (Doctoral dissertation, JKUAT-COHRED).
- Kabiawu, O., van Belle, J. P., & Adeyeye, M. (2016). Designing a Knowledge Resource to Address Bounded Rationality and Satisficing for ICT Decisions in Small Organizations. *The Electronic Journal of Information Systems in Developing Countries*, 73(1), 1-18.
- Kahuthu, D. G. (2016). *Impact of Prudential Regulation on Financial Performance of Deposit Taking Savings and Credit Cooperative Societies in Kenya* (Doctoral dissertation, COHRED, JKUAT).
- Kankindi Boani, D. (2019). Problems and solutions of rice cooperatives in Rwanda.
- Kehinde, A., Adeyemo, R., Oke, J. T. O., & Ogunleye, A. S. (2018). Effects of Access to Credit and Membership in Farmers' Cooperatives on Improved Technologies Adoption

- Categories in Cocoa-Based Farming Systems of Southwestern Nigeria. *International Journal of Cooperative Studies*, 7(2), 22-29.
- Kelly, R. F., Hamman, S. M., Morgan, K. L., Nkongho, E. F., Ngwa, V. N., Tanya, V., ... & Mazeri, S. (2016). Knowledge of bovine tuberculosis, cattle husbandry and dairy practices amongst pastoralists and small-scale dairy farmers in Cameroon. *PLoS One*, 11(1), e0146538.
- Kern, H. L., Stuart, E. A., Hill, J., & Green, D. P. (2016). Assessing methods for generalizing experimental impact estimates to target populations. *Journal of research on educational effectiveness*, 9(1), 103-127.
- Kilima, F. T. M., & Kurwijila, L. R. (2020). Integrating Smallholder Farmers to Commodity Value Chains in Sub-Saharan Africa: Challenges, Prospects and Policy Issues. In *Climate Impacts on Agricultural and Natural Resource Sustainability in Africa* (pp. 407-428). Springer, Cham.
- Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of chiropractic medicine*, 15(2), 155-163.
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., & Friedman, R. (2018). A theory of goal systems. In *The motivated mind* (pp. 215-258). Routledge.
- KWANYA, T., & Wasinda, J. A. (2019). Knowledge Sharing and Diffusion strategies in Savings and Credit Cooperatives in Kenya. *African Journal of Co-operative Development and Technology*, 4(I), 1-9.
- Kyaitha, R. S., & Nzioki, P. M. (2017). Corporate Governance Practices And Financial Performance Of Housing Cooperatives In Kenya. *European Journal of Economic and Financial Research*.

- Langat, J. (2016). *Influence of savings and credit cooperative societies' products on members livelihoods: A Case of Imarisha Sacco* (Doctoral dissertation, University Of Nairobi).
- Laurini, R. (2018). *Information systems for urban planning: a hypermedia cooperative approach*. CRC Press.
- Leavy, P. (2017). *Research design: Quantitative, qualitative, mixed methods, arts-based, and community-based participatory research approaches*. Guilford Publications.
- Lee, Y. S., Kim, Y. S., Sung, C. H., Shin, Y. J., & Cho, W. S. (2017). A descriptive research on field situation of customized modification for vulnerable single elderly home. *Journal of the Korean housing association*, 28(3), 55-64.
- Luster, E. L. (2018). Reducing Internal Theft and Loss in Small Businesses.
- Mason, E. (2017). 2016 Labour History Review Essay Prize Winner: 'The Co-operative Commonwealth Is the Only Answer to the Fascist Empire': Support for Republican Spain Within the British Co-operative Movement, 1936–1939. *Labour History Review*, 82(3), 189-213.
- Meyliana, M., Cassandra, C., Surjandy, H. A. E., Widjaja, E. F., Prabowo, H., & Joseph, C. (2019). DEFYING THE CERTIFICATION DIPLOMA FORGERY WITH BLOCKCHAIN PLATFORM: A PROPOSED MODEL. In *Proceedings of the International Conferences ICT, Society, and Human Beings 2019; Connected Smart Cities 2019; and Web Based Communities and Social Media 2019* (pp. 63-71).
- Mmari, G. A., & Thinyane, L. C. (2019). Analysis of Factors Influencing Financial Performance of Savings and Credit Co-operative Societies in Lesotho: Evidence From Maseru District. *International Journal of Financial Research*, 10(2), 121-136.

- Mojo, D., Degefa, T., & Fischer, C. (2017). The Development of Agricultural Cooperatives in Ethiopia: History and a Framework for Future Trajectory. *Ethiopian Journal of the Social Sciences and Humanities*, 13(1), 49-77.
- Monahan, P. O., Kroenke, K., Callahan, C. M., Bakas, T., Harrawood, A., Lofton, P., ... & Galvin, J. E. (2019). Reliability and Validity of SymTrak, a Multi-Domain Tool for Monitoring Symptoms of Older Adults with Multiple Chronic Conditions. *Journal of general internal medicine*, 34(6), 908-914.
- Monbiot, G. (2017). *Out of the wreckage: A new politics for an age of crisis*. Verso Books.
- Moruf, O., & SHITTU, S. A. (2019). Perception of Electronic Cooperative Financing By Smes Members In Oyo State, Nigeria. *Fountain University Osogbo Journal Of Management*, 3(3).
- Mpiima, D. M., Manyire, H., Kabonesa, C., & Espiling, M. (2019). Gender analysis of agricultural extension policies in Uganda: informing practice?. *Gender, Technology and Development*, 23(2), 187-205.
- Muithya, V. K. (2019). *Internal factors affecting growth of savings and credit cooperative societies in Machakos county, Kenya* (Doctoral dissertation).
- Mukherjee, S., & Pyne, S. (2016). Cooperatives as alternative form of organization for CSR effectiveness: Insights from Rabindranath Tagore. *Global Business Review*, 17(6), 1497-1509.
- Mutiso, P. W. (2017). *Factors Influencing Adoption Of Digital Weighing Scales Among Coffee Co-Operative Societies In Imenti North Sub-County, Meru, Kenya* (Doctoral dissertation, University of Nairobi).

- Nayak, B. K. (2010). Understanding the relevance of sample size calculation. *Indian journal of ophthalmology*, 58(6), 469.
- Ngongo, C. O. (2019). *Analysis of factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County* (Doctoral dissertation, Strathmore University).
- Ngongo, C. O. (2019). *Analysis of factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County* (Doctoral dissertation, Strathmore University).
- Njagi, C. M. (2019). *Relationship between resource mobilization and wealth maximization in saving and credit cooperative societies in Meru County, Kenya* (Doctoral dissertation, KeMU).
- Njeri, K. B. (2017). *Strategic Leadership And Performance Of Coffee Cooperative Societies In Nyeri County, Kenya* (Doctoral dissertation, Kenyatta University).
- Njue, M. N., & Mbogo, M. (2017). Improving Access To Banking Products And Services For Small And Medium Enterprises In Kenya. *International Journal of Finance*, 2(3), 47-66.
- Njuguna, J., Gakure, R., Waititu, A., & Katuse, P. (2017). Operational risk management strategies and the growth of microfinance sector in Kenya.
- Nwokoye, E. S., Oyim, A., Dimnwobi, S. K., & Ekesiobi, C. S. (2019). Socioeconomic Determinants Of Information And Communication Technology Adoption Among Rice Farmers In Ebonyi State, Nigeria. *Nigerian Journal of Economic and Social Studies*, 61(3).
- Nyandika, J. N., Muturi, W., & Mogwambo, V. A. (2016). Effects of selected economic growth indicators on the financial performance of Sacco societies in Kenya.

- Nylund, M. (2018). Finland: Voluntary Organisations and Co-operatives for Socio-economic Reintegration in Finland Pekka Pättiniemi, Harri Kostilainen. In *Tackling Social Exclusion in Europe* (pp. 109-126). Routledge.
- O'Dwyer, M., & Gilmore, A. (2018). Value and alliance capability and the formation of strategic alliances in SMEs: The impact of customer orientation and resource optimisation. *Journal of Business Research*, 87, 58-68.
- O'Leary, Z. (2017). *The essential guide to doing your research project*. Sage.
- Oloyede, S. A., Ikpefan, O. A., Akinjare, A. O., & Oloke, C. O. (2017). Cooperative societies, housing provision and poverty alleviation in Nigeria. *Covenant Journal of Research in the Built Environment*, 5(1).
- Onah, O. G. (2017). *Performance of Farmers' Multipurpose Cooperative Societies in Enugu North Agricultural Zone of Enugu State, Nigeria* (Doctoral dissertation).
- Otii, L. O., Lawrence, K., & Omondi, H. (2020). Technological innovation promoters, service quality practices and performance of SACCOs in Kenya. *International Journal of Research in Business and Social Science* (2147-4478), 9(4), 392-403.
- Patel, S. (2019). Role and opportunity of ICT in co-operative sector.
- Pearson, R. (2019). *Investigating Understanding and Facilitation of Social Emotional Development at a Diverse Socio-economic Status YMCA Preschool* (Doctoral dissertation, Creighton University).
- Quan-Haase, A., Martin, K., & Schreurs, K. (2016). Interviews with digital seniors: ICT use in the context of everyday life. *Information, Communication & Society*, 19(5), 691-707.
- Roelants, B., Eum, H., Esim, S., Novkovic, S., & Katajamäki, W. (Eds.). (2019). *Cooperatives and the World of Work*. Routledge.

- Rosenthal, M. (2016). Qualitative research methods: Why, when, and how to conduct interviews and focus groups in pharmacy research. *Currents in pharmacy teaching and learning*, 8(4), 509-516.
- Rubino, M., Vitolla, F., & Garzoni, A. (2017). The impact of an IT governance framework on the internal control environment. *Records Management Journal*.
- Sahu, S. K., & Singh, T. J. (2016). *Research Methodology: Latest Edition*. SBPD Publications.
- Sami, M., Noordin, N. K., Khabazian, M., Hashim, F., & Subramaniam, S. (2016). A survey and taxonomy on medium access control strategies for cooperative communication in wireless networks: Research issues and challenges. *IEEE Communications Surveys & Tutorials*, 18(4), 2493-2521.
- Sari, D. A. P., Falatehan, F., Irawan, D. S., Sedana, G., & Rahim, R. (2018). Mitigation and Adaptation Analysis of the Climate Change Impact Using Sustainable Livelihood Model. *Int. J. Eng. Technol*, 7(2.5), 108-114.
- Sathyamoorthi, C. R., Mbekomize, C. J., Radikoko, I., & Wally-Dima, L. (2016). An Analysis of the Financial Performance of Selected Savings and Credit Co-Operative Societies in Botswana. *International Journal of Economics and Finance*, 8(8).
- Schlechta, K. (2018). A Reliability Theory of Truth. *arXiv preprint arXiv:1801.01788*.
- Senkbeil, M., & Ihme, J. M. (2017). Motivational factors predicting ICT literacy: First evidence on the structure of an ICT motivation inventory. *Computers & Education*, 108, 145-158.
- Sharma Neupane, S. R. (2018). *Co-operative movement: a people based development approach, its role in the economy of Nepal* (Doctoral dissertation).
- Sharma, P. (2019). Impact of Technology and Regulation on Financial Services: Opportunities and Challenges for the Banking Sector.

- Shrivastava, P., & Vardhan, S. (2018). Reach and use of ICT in Agriculture Sector In Madhya Pradesh.
- Sudan, F. K. (2019, June). Role of Dairy Cooperatives in Achieving the Economic Dimension of the SDGs. In *Prossiding. Implementing the Sustainable Development Goals: What Role for Social and Solidarity Economy. UNTFSSSE Call for Papers 2018*.
- Sultana, M., Ahmed, J. U., & Shiratake, Y. (2020). Sustainable conditions of agriculture cooperative with a case study of dairy cooperative of Sirajgonj District in Bangladesh. *Journal of Co-operative Organization and Management*, 8(1), 100105.
- Sunday, C. E., & Vera, C. C. E. (2018). Examining information and communication technology (ICT) adoption in SMEs. *Journal of Enterprise Information Management*.
- Taherdoost, H. (2016). Validity and reliability of the research instrument; how to test the validation of a questionnaire/survey in a research. *How to Test the Validation of a Questionnaire/Survey in a Research (August 10, 2016)*.
- Tenzin, G., & Natsuda, K. (2016). Social capital, household income, and community development in Bhutan: a case study of a dairy cooperative. *Development in Practice*, 26(4), 467-480.
- Tuan, P. T. (2018). Factors Influencing Member Value in Agricultural Co-operatives in Vietnam.
- Umebali, E. E., Nwankwo, F., & Usman, U. A. (2018). Performance of Cooperative Management Committee In Kaduna Polytechnic, Kaduna. *International journal of arts, languages and business studies*, 1(1).
- Wang, Q., Yuan, X., Zuo, J., Zhang, J., Hong, J., & Lin, C. (2016). Optimization of Ecological Industrial Chain design based on reliability theory—a case study. *Journal of cleaner production*, 124, 175-182.

- Wanyama, F. O. (2016). Surviving liberalization: the cooperative movement in Kenya.
- Wanyama, F. O. (2016). Surviving liberalization: the cooperative movement in Kenya.
- Williams, R. C. (2016). *The cooperative movement: Globalization from below*. Routledge.
- Yebowaah, F. A., & Plockey, F. D. D. (2017). Awareness and Use of Electronic Resources in University Libraries: A Case Study of University for Development Studies Library. *Library Philosophy & Practice*.
- Yim, M., Fellows, M., & Coward, C. (2019). Examining the role of public library as access venues for information and communication technologies (ICTs) in developing countries: A case in Namibia. *iConference 2019 Proceedings*.
- Yunis, M., Tarhini, A., & Kassar, A. (2018). The role of ICT and innovation in enhancing organizational performance: The catalysing effect of corporate entrepreneurship. *Journal of Business Research*, 88, 344-356.
- Ziamba, E. (2019). The contribution of ICT adoption to the sustainable information society. *Journal of Computer Information Systems*, 59(2), 116-126.

APPENDIX I: TIME FRAME

Year	Month	Activity
2020	January	Focusing on a concept paper
	February	Developing a research proposal
	March	Submission of the first draft of the research proposal
2020	April	Presentation to the department
	May	Survey of the study area & collection of the data
2020	June	Field-work data analysis
	June	Submission of thesis
	June	Defense of thesis
	June	Correction and submission of thesis

APPENDIX II: BUDGET

ITEM DESCRIPTION	TOTAL PER ITEM	TOTAL	
		Ksh	Cts
3 notebooks	100	300	00
A diary	200	200	00
1/2 dozen of blue pens	20	120	00
2 ream of foolscaps	500	1,000	00
3 folders	200	600	00
Flash disk 8 GB	1500	1,500	00
SUB TOTAL		3,720	00
INTERNET COSTS			
Modem internet browsing (3GB)	2000	2,000	00
SUB TOTAL		2,000	00
TRAVEL EXPENSES			
Paying research assistance, food and training for three research assistance for 1 week	25000	25,000	00
SUBTOTAL		25,000	00
REPORT PREPARATION			
Photocopying, printing & binding expenses			
i. Questionnaires (140 copies)	25	3,500	00
ii. Proposal (6 copies)	500	3,000	00
iii. Report (6 copies)	1,000	6,000	00
Data Analysis	20,000	20,000	00
SUBTOTAL		32,500	00
TOTAL		63,220	00
Add contingencies 10% of the total cost		6,322	00
GRANDTOTAL		69,542	00

**APPENDIX III: LETTER OF INTRODUCTION
UNIVERSITY OF NAIROBI**

SCHOOL COMPUTING &INFORMATICS

To Mr. /Mrs..... Date.....20.....

Dear Sir / Madam,

REG NO: P54/11444/2018

Dear Respondent!

Hallo, my name is Elijah Tonui a master's student from the University of Nairobi, School of Computing & Informatics. I am doing a research the influence of ICT on revenue generation and livelihoods of the members of SME-instituted co-operative societies, a case study of selected 5 Dairy Co-operative Societies in Kiambu County. I would wish to invite you to participate in this exercise by providing information in regard to influence of ICT on revenue generation and livelihoods of the members of SME-instituted co-operative societies in Kiambu County. Would you be willing to provide me with the required information?

If so, you have then been selected to participate in this study. The information that was obtained from you was treated with utmost confidentiality.

The questionnaire attached is designed to collect data from Farmers (Members) of the selected Dairy Co-operative Societies in Kiambu County. The data collected was used and reported in aggregate form; no individual responses was referred to or quoted. The information you give will also be treated as confidential.

Yours Sincerely,

Name: Elijah Tonui

APPENDIX IV: QUESTIONNAIRES
UNIVERSITY OF NAIROBI
SCHOOL OF COMPUTING & INFORMATICS

**RESEARCH TITLE: THE INFLUENCE OF ICT ON REVENUE GENERATION AND
LIVELIHOODS OF THE MEMBERS OF SME-INSTITUTED CO-OPERATIVE
SOCIETIES IN KIAMBU COUNTY**

RESPONDENTS' ASSURANCE

This study is purely an academic work. It is in partial fulfillment of the requirement for the award of MSC. Information Technology Management

SECTION A: PERSONAL INFORMATION

1. Gender of respondent.
 - a) Male [] b) Female []
2. Age of respondent.
 - a) 18 – 30 years [] b) 31 – 45 years []
 - c) 46 – 60 years [] d) 61 years and above []
3. How long have you been a member of SME-instituted SACCO X?
 - a) Less than 5 years [] b) 5 -10years []
 - c) more than 10 years []

SECTION B: ICT AND RISK FACTORS

The following are ICT Risk factors influencing ICT utilization by Dairy Co-operative Societies in Kiambu County. Kindly give your opinion in regard to the Dairy Co-operative Societies you are affiliated to in a Linkert scale of 1-5, (where 1= Strongly Agree, 2= Agree, 3= No Opinion, 4= Disagree and 5= Strongly Disagree).

1. I use mobile phones as the main co-operatives ICT tools available to all members for enhanced interaction

[] Strongly Agree	[] Agree	[] No Opinion
[] Disagree	[] Strongly Disagree	

2. My revenue and earnings in terms of dividends and bonuses are influenced by risks associated with ICT systems

<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No Opinion
<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree	
3. Forgery of co-operative documentations by ICT experts may affect my income through unauthorized mobile money transfers.

<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No Opinion
<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree	
4. High cost of ICT services adopted by cooperative societies tends to reduce my earnings

<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No Opinion
<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree	

SECTION C: DIGITAL RESOURCE FACTORS

The following are possible effect of ICT Digital Resource Factors on revenue generation and livelihood of selected Dairy Co-operative Societies members in Kiambu County. Kindly give your opinion in regard to the Dairy Co-operative Societies you are affiliated to in a Linkert scale of 1-5.

1. Do Digital Resource Factors make ICT utilization affordable to you and other members of co-operative society?

<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No Opinion
<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree	
2. Do you agree that Digital Resource Factors promotes convenience and efficiency in running cooperative societies for enhanced service delivery?

<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No Opinion
<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree	
3. Do you consider Digital Resource Factors as a reliable ICT platform utilized by Dairy cooperative societies?

<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No Opinion
<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree	

4. Digital Resource Factors promotes my access to and ease payment of my bonuses and dividends.

Strongly Agree Agree No Opinion

Disagree Strongly Disagree

5. Do Digital Resource Factors speed processes of accessing financial assistance for you?

Strongly Agree Agree No Opinion

Disagree Strongly Disagree

SECTION D: ICT MOTIVATIONAL FACTORS

The following are possible motivational factors that influence ICT utilization by selected Dairy Co-operative Societies in Kiambu County. Kindly give your opinion in regard to the Dairy Co-operative Societies you are affiliated to in a Linkert scale of 1-5, (where 1= Strongly Agree, 2= Agree, 3= No Opinion, 4= Disagree and 5= Strongly Disagree).

1. I access information about my bonuses or dividends on the co-operative ICT platform.

Strongly Agree Agree No Opinion

Disagree Strongly Disagree

2. I find access to my financial information on the co-operatives platform timely.

Strongly Agree Agree No Opinion

Disagree Strongly Disagree

3. I monitor revenues from produce delivered using the co-operatives ICT platform

Strongly Agree Agree No Opinion

Disagree Strongly Disagree

4. I use the financial information to make decisions on my financial wealth.

Strongly Agree Agree No Opinion

Disagree Strongly Disagree

SECTION E: INFLUENCE OF ICT ON LIVELIHOOD AND REVENUE STRATEGIES

The following are possible influence of ICT utilization on Livelihood and Revenue Generation among members of selected Dairy Co-operative Societies in Kiambu County. Kindly give your opinion in regard to the Dairy Co-operative Societies you are affiliated to in a Linkert scale of 1-5, (where 1= Strongly Agree, 2= Agree, 3= No Opinion, 4= Disagree and 5= Strongly Disagree).

1. ICT platforms result to social stratification and classification among the co-operative members.
 Strongly Agree Agree No Opinion
 Disagree Strongly Disagree
2. ICT platforms in co-operative societies improve my financial capital and financial well-being by increasing my revenue generation (income).
 Strongly Agree Agree No Opinion
 Disagree Strongly Disagree
3. ICT platforms used by co-operative society's eases my access to credit or loan.
 Strongly Agree Agree No Opinion
 Disagree Strongly Disagree
4. I can learn more on modern farming techniques from ICT platforms adopted by cooperative societies.
 Strongly Agree Agree No Opinion
 Disagree Strongly Disagree
5. ICT platforms are avenues where I can access and learn Post-harvest handling Techniques thus minimize wastages brought about by poor post-harvest handling techniques.
 Strongly Agree Agree No Opinion
 Disagree Strongly Disagree

THANK YOU

APPENDIX V: INTERVIEW SCHEDULE

UNIVERSITY OF NAIROBI, DEPARTMENT OF COMPUTING & INFORMATICS

RESEARCH TITLE: THE INFLUENCE OF ICT ON REVENUE GENERATION AND LIVELIHOODS OF THE MEMBERS OF SME-INSTITUTED CO-OPERATIVE SOCIETIES IN KIAMBU COUNTY

SECTION A: PERSONAL INFORMATION

1. Gender of respondent.
 - a) Male [] b) Female []
2. Age of respondent.
 - a) 18 – 30 years [] b) 31 – 45 years []
 - d) 46 – 60 years [] d) 61 years and above []
3. How long have you worked for your SME-instituted SACCO?
 - a) Less than 5 years [] b) 5 -10years []
 - d) more than 10 years[]

SECTION B: RESEARCH QUESTIONS

4. What incentives can encourage co-operative society's management to adopt ICT tools?
5. How do Digital Resource Factors make ICT utilization affordable to you and other members of co-operative society?
6. How does ICT utilization promote knowledge about an asset base of co-operative societies and thus increase their performance?
7. How reliable and accessible are the adopted ICT strategies in the recording and marketing of members' produce?
8. How are the ICT tools in co-operative societies increasing capital resources in spite of costs and risks?

9. How are the ICT automated payment systems of dividends and shares impacting the livelihood of the members?
10. How have adopted ICT platforms led to social stratification and classes among the members of cooperative societies?
11. What is the perception of your cooperative management on the staff ICT proficiency requirements?
12. Could you describe how the management of your cooperative views ICT as a strategic resource in its day-to-day operations?