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The Effect of operational efficiency on self-sufficiency of dairy cooperatives: a case study of Lelan Dairy in West Pokot County, Kenya

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THE EFFECT OF OPERATIONAL EFFICIENCY ON SELF-SUFFICIENCY OF DAIRY COOPERATIVES: A CASE STUDY OF LELAN DAIRY IN WEST POKOT COUNTY, KENYA

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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ABSTRACT

Dairy cooperatives continue to face challenges on sustaining self- sufficiency despite their fundamental role in improving small holder farmer's livelihoods around the world. Self-sufficiency is an important aspect of an organization as it determines its extent of independence in sustaining operations without external support while retaining competitive advantage in a dynamic business environment. One of the determinants of self-sufficiency in an organization is operational efficiency which depends on investment and expenditure management and staff productivity. This study sought to determine the effect of operational efficiency on self-sufficiency of dairy cooperatives in Kenya. The specific study objectives were: To determine the effect of investment management on self-sufficiency; To investigate the effect of expenditure management on self-sufficiency; To examine the influence of staff productivity on self-sufficiency using Lelan Dairy Cooperative in West Pokot County, Kenya. The study adopted descriptive research design using a case study. The target population was 5,313 registered and members of the cooperative. The study sample size was 372 respondents. Questionnaires and interview guides were used for primary data collection while secondary data was collected through review of audited financial reports. Analysis was done using descriptive statistics, thematic and content analysis, and Spearman's coefficient of correlation. The results showed existence of a strong positive relationship between investment management and staff productivity and self-sufficiency. Spearman's test revealed a correlation coefficient value of 0.600 and 0.700, respectively. Besides, there was a moderately positive effect between expenditure management and self-sufficiency with coefficient value of 0.510. The study limitation was that research data depended on the honesty and accuracy of respondents, but with assurance of anonymity and proper use of findings, researcher is optimistic they gave accurate data. It is recommended that policy makers, leadership and managers should develop and implement policies that promote investment management, expenditure management and staff productivity best practices both at the organizational and country level.

Key words: *Operational Efficiency, Staff productivity, Investment Management, Expenditure Management, Self-Sufficiency, Dairy Cooperatives*

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ABBREVIATIONS AND ACRONYMS

KDB	Kenya Dairy Board
FAO	Food and Agriculture Organization
MOLD	Ministry of Livestock Development
KMDP	Kenya Market-led Dairy Programme
MSFs	Middle scale farmers
LSFs	Large scale farmers
GDP	Gross Domestic Product
OSS	Operational self-Sufficiency
FSS	Financial Self-Sufficiency
SACCO	Savings and Credit Cooperative Society
OER	Operating Expense Ratio
DER	Debt Equity Ratio

DEDICATION

To my humble parents, siblings and friends for their moral support and encouragement that fuelled this dissertation to fruition.

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CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter briefly introduces the research dissertation paper describing the background of the study, the importance of operational efficiency and self-sufficiency in agricultural cooperatives, outlines the problem at hand and highlights the research objectives and questions. The chapter also outlines the significance and scope of the study.

1.1 Background of the study

One of the most significant goals of the management and leadership of every business-oriented institution is to capitalize on financial and operational performance as they affect their competitive advantage, sustainability, and self-sufficiency (Gill, et al., 2012). An organization can be described as self-sufficient if it can maintain its operations independently to the greatest extent and time possible without external support (Wales, 2013). It is the degree to which an organization sustains its activities profitably without requiring assistance from others (Wales, 2013). The current business environment is so dynamic that self-sufficiency is a fundamental aspect of every organization that yearns to maintain its market share and retain its competitive advantage while meeting its stakeholder's needs (Beg, 2016). Self-sufficiency is sometimes used synonymously with self-sustainability both of which entails both financial and operational efficiency.

Dairy cooperatives play an important role in improving small holder dairy farmer's livelihoods in both developed and developing countries (Wanjiku, 2017). Cooperatives are membership organizations (where members are shareholders) through which members collectively market their produce for increased profits. According to a report by FAO (2018), the global milk production was estimated at 843 million tons compared to 811 million tons in 2017 with the major producers being India, Turkey, Pakistan, the United States of America, the European Union, and Argentina which demonstrates the significance of the dairy sector all over the world. Equally, the dairy sector plays a fundamental role in Africa and the East Africa region (FAO, 2018). Though milk production has been stagnating over the years in this region, East Africa

produces 68% of the continents milk (FAO, 2018; World Bank, 2011). Kenya, Uganda, and Tanzania are among the biggest dairy producers in Africa, with their cumulative production standing at 9.7 billion liters in the year 2015 (Muchira, 2018). This demonstrates the importance of dairy cooperatives in contribution of dairy farmer's livelihoods in this region.

Kenya is one of the East African countries that produce considerable milk for its domestic consumption and export, second to South Africa (KDB, 2012). In fact, dairy is the largest livestock sub-sector in Kenya contributing 4 percent to the national GDP while contributing approximately 30% of agricultural GDP (FAO, 2011). The dairy sub-sector produces an estimated 4.8 million tons of milk with cow milk being estimated at 4.5 million tones, goat milk 150,000 tones and camels' milk being approximated to be 50,000 tons annually (KDB, 2012). It is also worth noting that dairy production in Kenya is dominated by small holder farmers who contribute 80 per cent of the national milk production while large-scale farmers supply the rest (FAO, 2011). The sector employs over 1 million people across the dairy value chain, and it has progressively grown huge in terms of investments from dairy cooperatives and marketed milk including the cold chain systems, production of extended shelf-life milk, ultra-high temperature treated milk and milk powder (KMDP, 2016; KDB, 2012). However, the small holder dairy production and marketing systems in the country is still faced by different challenges including low production levels, poor pricing, and low returns which farmers have attempted to address through dairy cooperatives (FAO, 2011).

Kenya has a long history of cooperative development that has been characterized by strong growth, thus making a significant contribution to the overall economy. Evidence shows that dairy cooperatives play an important role in Kenya's economy handling more than 76 percent of dairy produce sales (Wanyama, Develtere, & Pollet, 2009). The cooperatives play the role of bringing dairy small holder farmers together to collectively market their milk produce either as raw or processed milk (FAO, 2011). According to Thorpe et al. (2003), less than 15 % of milk

in Kenya is marketed through processors such as Brookside while most of the non-processed/raw milk is marketed through dairy cooperatives who sell directly to consumers or to the processors.

It is evident that the role of dairy cooperatives in Kenya in terms of contribution to the economy and improvement of their member's income cannot be underscored (Mwangi, 2013). However, the current dairy business environment is characterized by competition with private companies (such as Brookside) which are in processing competing with farmer-founded/owned cooperatives. This therefore calls for clear-cut strategies and goals towards withstanding competition (FAO, 2011). Achieving and maintaining operational efficiency thus becomes a fundamental strategy for the dairy cooperatives to adopt and implement to achieve self-efficiency.

1.1.1 Different aspects of Operational Efficiency

Financial and operational efficiency are important aspects in achieving self-sufficiency and overall sustainability of an organization (Gill, et al., 2012). Operational efficiency is a fundamental aspect of every institution regardless of the sector in which it operates. It is a critical factor that drives sustainability and growth of organizations and institutions in both developing and developed countries. Argarwal (2013) defines efficiency as the ability to utilize minimum resources possible to produce an output or to achieve a result. It means producing maximum results/output with the least quantity of resources including labor, effort time or finances (Argarwal, 2013). Ndolo (2015) agrees to this view by indicating that operational efficiency is concerned with maximizing outputs which may be goods or services from each unit of input; where input is measured in terms of the time, effort, people, and costs of producing the output.

Picincu (2018) further elaborates that operational efficiency refers to the practices that a company, firm or organization adopts to improve its processes so that it can consistently offer quality goods or services to its customers using the minimum resources possible. An organization that achieves operational efficiency achieves its goals to deliver better goods or

services at better prices while decreasing its expenses (Picincu, 2018). According to McClay (2019) operational efficiency entails maximum use of available resources including raw materials and labor to create high quality products and services. This study adopts the definition of operational efficiency by Picincu (2018) who indicate that operational efficiency entails the practices intended to improve an institution's processes to run efficiently and constantly offer quality services with minimum use of resources.

The concept of operational efficiency is fundamental in farmer cooperatives whose central goal is to mobilize resources from the members and facilitate value creation from the member's produce for increased profits (Reynolds, 2013). Appointment Plus (2013), explains that operational efficiency is the evaluation of the output produced from the input where the input is measured in terms of cost, people, time, and work while output is measured as income, profit margin, new customers, market differentiation, increased production, innovation, quality, speed, among other attributes of goods and services. Gill et al (2012) agree to this view and indicates that the management of every business must take into consideration various features of operational efficiency for the business to achieve sustainable organizational performance. In this regard, the cooperatives should be able to limit unnecessary use of resources to be able to offer competitive prices for the member's produce as well as increase their shareholding value.

According to Ndolo (2015), operational efficiency is a critical element for long-term solvency of any business/institution. Ndolo (2015) continues to elaborate that both financial and operational performance affect market price per share and stakeholder's wealth in an organization. Ndolo (2015) further indicate that operational efficiency has progressively gained interest in the modern business environment due to increased competition, improved business processes as well evolution of technology. The uncertainty in the business environment requires that institutions diversify their strategies and increase their liquid holdings to decrease the risk of collapsing (Goel, 2012). Goel (2012) further asserts that there exists a stiff competition in the business operation environment and hence the need for businesses and institutions to strive to achieve

favorable operating performance to sustain competitive advantage. According to Gill et al. (2014), enhancing operational efficiency is a fundamental aspect of every organization because it has a direct effect on their profit margins besides cost effectiveness. Efficiency should however not be confused with Effectiveness. Effectiveness measures the degree to which a business achieves its goals, or the way outputs interact with the economic and social environment. Usually, effectiveness determines the policy objectives of the organization or the degree to which an organization realizes its own goals (Zheng, 2010). Effectiveness and efficiency are exclusive, yet, at the same time, they influence each other; therefore, it is important for management to assure success in both areas.

Mwangi (2013) elaborates that dairy cooperative require various strategies in sustaining their operational performance to increase profitability to their members, reduce operation costs and sustain financial performance which are critical in achieving self-sufficiency. Ndolo (2015) agrees to this view by indicating that operational efficiency entails controlling and reducing unnecessary costs and maximizing the available resource capacities to achieve self-sufficiency and sustainability. Maximization of resources calls for innovation and implementation of well formulated investment strategies that result to proper investment management (Gathungu, 2015).

Investment management is the practice of managing both securities (such as shares and bonds) and other assets of an organization to meet the investment goals of the investors (Gathungu, 2015). According to Reilly and Brown (2014), investment management is conventionally classified into two structures namely direct delegation and mutual fund investment structures. Peterson, et al. (2011) indicates investment management delegation structures can be classified into mutual funds and segregated funds. Erico (2012) describes investment management as the process of developing specific investment goals and objectives, determining asset allocation based on the set objectives and proceeding to implement specific investment options based on risk assessment. Erico (2012) elaborates that the process is accompanied by close monitoring to ensure risk control and appropriate adaptation depending on the macro-economic

business/market environment. Thus, investment management is an important aspect of operational efficiency. This study adopted the definition of investment management by Erico (2012) which entails setting investment goals and allocation of assets based on risk assessment.

Dairy cooperatives are tasked by their members to ensure good investment management for increased benefits. It is important to note that investment management does entail asset management. Asset management is a systematic methodology to the governance of assets owned by an individual, group, or an organization to realize their maximum value throughout their life cycle (Ganti, 2019). Assets can be categorized as either tangible or intangible assets and they include but are not limited to buildings, machines, equipment, human capital, intellectual property, and financial assets (Ganti, 2019). According to Corporate Finance Institute (2015), the process of asset management entails developing, sustaining, improving, and disposing of assets in the most cost-effective manner through a coordinated approach that reduces risks while maintaining organizational performance and sustainability. Some dairy cooperatives in Kenya add value to milk or are also processors and as such their members have invested in equipment and machinery (Wanjiku, 2017). This makes asset management an important process for the cooperatives to ensure their optimal use at lower costs based on the customer's asset assortment with time while mitigating the possible risks (Ganti, 2019).

Expenditure management is also a fundamental approach to operational efficiency. Expenditure management entails putting in place systems and procedures that guarantee effective, efficient, and timely payments (salaries, bonuses, debts) in an organization. It also entails procedures that uphold fiscal discipline regarding alignment of expenditures to the revenues, adherence of budget allocations to strategic priorities (Ganti, 2019). It entails keeping the organizational expenditure within sustainable limits where the organization do not spend more than they can afford; do not get into unnecessary debts. Expenditure management is therefore critical in a farmer cooperative.

Another important aspect of operational efficiency and hence self-sufficiency is staff productivity. Ndolo (2015) elaborates that competent and skillful staff, return to scale of the business, technological advancement and cost control are important aspects of organizational operational efficiency. The competency and skillfulness of the staff in an organization is a critical factor in determining staff productivity which ultimately affects operational efficiency. Chandranshu and Ruchi (2012) puts emphasis by indicating that the human asset is the most significant asset of every organization that yearns to gain operational and even financial efficiency. Therefore, every organization is faced by the uphill task of enhancing the engaging highly competent and performing employees to meet their organizational efficiency (Chandranshu & Ruchi, 2012). This is because there is a direct relationship between employee's productivity and operational efficiency (Sowath, 2013). Besides, it is worth noting that operational efficiency and financial adequacy are important in ensuring sustainability and self – sufficiency of an organization.

1.1.2 Background to Farmer Cooperatives

According to International Cooperative Alliance, Cooperatives are people-centered enterprises owned and run by and for their members to realize common dreams and goals (Makoni et al, 2014). Cooperatives are thus membership organizations through which members aggregate and collectively market their produce while accessing other services (Woldu, et al., 2013). Farmer cooperatives play a fundamental role in coordination of different value chain activities and provision of agronomic and value chain support services (Muricho, 2011). Ling (2010) agrees to this view and indicates that co-operatives are created to protect members from exploitation through provision of quality goods and services. Reynolds (2013) further asserts that cooperatives are owned by members and create value by aggregating information from members through member needs into products and services. Co-operatives also provide services to consumers including farmers which would otherwise not be available especially in rural areas or where a large population is excluded due to lack of financial services (Cooperative Development Policy, 2017).

The cooperative model in Kenya has had a myriad of challenges since in the 1990s, when it was near collapse. However, it has progressively undergone a dynamic period of revival which could be attributed to improved policy environment in Kenya that has positively impacted on farmer organizations and cooperative societies, including dairy cooperatives (Makoni et al, 2014).
Like any other cooperatives in Kenya, dairy cooperatives are membership-based organizations formed by at least 15 members with similar interests of advancing dairy farming. Normally a cooperative is governed by 9 to 12 board members depending on the agreed governance structure (Cooperative Act, 2012). These committee members are elected by the entire membership of a cooperative (Cooperative Act, 2012). A dairy cooperative collects milk from farmer's majority of whom are members, for marketing or processing and provides payment to the suppliers either once or twice a month (Fernandez, 2010).

According to Fernandez (2010), the democratically run "cooperative" businesses are respectably profitable. They are business entities that buy agricultural produce from members and sell or add value to the products and services from their members with a focus on achieving higher profitability collective bargaining and marketing. According to Petersen (2016), cooperatives can more easily obtain discounts on supplies and other materials and services by leveraging their size as suppliers are more likely to give better products and services based on working with a customer of more substantial size. Consequently, the members of the cooperative can focus on improving products and services (Petersen, 2016). It is therefore important to ensure that they are financially and operationally efficient and sustainable (Shiferaw & Muricho, 2011).

The cooperative model is not entirely effective as they may suffer from slower cash flow since a member's incentive to contribute depends on how much they use the cooperative's services and products. While the "one member-one vote" philosophy is appealing to small investors, larger investors may choose to invest their money elsewhere because a larger share investment in the cooperative does not translate to greater decision-making power (Petersen, 2016). This study

sought to evaluate the effect of operational efficiency on self-sufficiency in dairy cooperatives by exploring variables of operational efficiency namely investment management, asset management and staff productivity. The study used Lelan Dairy in West Pokot County as a case study.

1.1.2.1 Lelan Dairy

Lelan Dairy (LD) is a farmer owned organization. It is situated in West Pokot County, Lelan division, in a rugged landscape. Lelan has 11 collection centers which serves farmers in both West Pokot and Transzoia Counties. The cooperative is registered as a company recorded an average daily collection of 18,300 kg of milk in 2016, 14,000 kg in 2017 and 15,500 kg in 2018. It has a total registered membership of 5,313 of which majority is actively delivering milk to the cooperative. The cooperative has 78 staff members allocated at different cooling centers. Due to the rugged landscape, the cooperative has made it possible for farmers to supply their milk at the nearest cooling centers. In this effect, Lelan has invested in 11 collection centers with each having an office and average staff of 5 members. The main site has 11 staff members.

Lelan Dairies experiences more than 60% drop in milk intakes especially during dry season as about 70% of their farmers are still practicing free range farming, where animals are left to graze on their own. This means that their 52,000 kg total capacity cooling centers is always underutilized. Out of the 11 cooling centers, 5 tanks were given as grants by the county government and the other 6 are owned by Lelan itself. The expansion in collection centers has always not been backed by figures nor feasibility studies which has always led to losses especially during dry periods. However, there is need to streamline decision making whenever investments are made. Furthermore, staff productivity is a challenge. Does the organization need 78 staff members? It is important to evaluate whether the 11 collection centers do breakeven. Finally, besides employment expenses, there is a need to investigate the entire expenditure management. In consideration of the fundamental role played by Lelan cooperative in terms of the counties it serves, being the biggest cooperative in the North Rift region and the interest that

the County Government have in supporting the cooperative to be efficient, this study chose to research on how operational efficiency affects the self-sufficiency of the cooperative.

1.2. Statement of the Problem

Farmer cooperatives have the potential to enable small holder producers capture a greater share of the value added in the agricultural value chain (Ton et. al., 2016). According to the International Cooperative Alliance (2012), the livelihoods of approximately 6 million and 20 million Kenyans directly and in directly depend on Cooperatives, respectively. Ton et al (2016), asserts that dairy cooperatives have enormous potential to enhance the bargaining power and economies of scale for dairy small holder farmers in Kenya. Despite their fundamental role in unlocking the potential in milk value chain for increased profitability to their members, the dairy cooperatives continue to face a myriad of challenges (International Cooperative Alliance, 2012). They are faced by stiff competition by private companies in the sector due to the dynamic business environment which requires them to adopt strategic measures to preserve their market space (Mwangi, 2013). There are about 30 active milk processors, with the largest being Brookside, New KCC, Githunguri and Daima, all of which provide competition to dairy cooperatives (KMDP 2016). The private companies such as Brookside have adopted innovative strategies such as taking over other private brands to increase market share in the East Africa region hence the need for dairy cooperatives to sustain optimal operating efficiency to remain competitive (Mutegi, 2017, Mwangi, 2013).

Dairy cooperatives in Kenya lack cost efficient systems resulting to poor milk pricing and low returns to the farmers (Ton et al., (2016). Murphy (2012) asserts that dairy cooperatives experience operational inefficiencies in processing and labor. Additionally, most assets in the cooperatives are not optimally efficient coupled with less efficient logistical systems and processes (Wanjiku, 2017; Murphy, 2012). FAO (2011) emphasizes that several cooperatives were formed after independence and have maintained old assets and infrastructures which are often inefficient profitability, poor financial and operational performance, and ultimately low

self-sufficiency. Other effects of operational inefficiencies in dairy cooperatives are weak member loyalty, unwillingness to invest in the cooperatives and poor-quality products that are not able to compete in the sector which also result to in-sufficiency (Gill et al. 2014).

Some dairy cooperatives add value and process milk thus have invested in machinery, transport systems and equipment's (such as coolers) which calls for operational efficiency to not only increase returns on the assets and member shares but also achieve enhanced financial performance and self-sufficiency (Wanjiku, 2017). Therefore, cooperatives require clear-cut strategies to ensure operational efficiency through optimal returns on assets and capital investments as well as staff labor utilization. This study evaluated ways in which cooperatives can enhance their operational efficiency through asset and investment management as well as staff productivity and its effect on self-sufficiency. Previous studies on operational efficiency have focused on its effect on performance while none have explored the effect of operational efficiency on self-sufficiency (Kinyanjui et al., 2018; Odunga, 2014; Kang'ethe, 2009; Mwangi (2013). The research explored both asset and financial investment management structures, the risk and opportunities of the cooperative, the co-investments, and partnerships of the cooperative with the ultimate objective of assessing the efficiencies in investments made by the cooperative. The study also assessed the systems and procedures that are in place to ensure effective, efficient, and timely payments in the cooperative as far as expenditure management is concerned. Finally, Staff productivity was determined through the labor productivity equation which quantitatively measures productivity by the number of products produced by an employee within a specific duration of time; total output / total input. The research therefore assessed the effect of operational efficiency on self- sufficiency of dairy cooperatives using a case study of Lelan Dairy in West Pokot County, Kenya. Lelan Dairy located on Pokot South is considered one of the safest regions in West Pokot, with the Company having been established because of peace agreement based on a long war history between Pokot and Marakwet communities. The company has become a marvel with the region attracting foreign direct investment from Israel investors seeking to partners with County government of West Pokot to establish a milk processing plant

(Chai, 2019; Cobbo, 2013). This unique genesis of the company proofs an interesting case study for the research to substantiate in all the gains achieved so far.

1.3. Research Objectives

1.3.1 General Objective

The general objective of the study was to determine the effect of investment management, expenditure management and staff productivity on self-sufficiency of dairy cooperatives in Kenya using a case study of Lelan Dairy Cooperative in West Pokot County, Kenya.

1.3.2 Specific Objectives

The specific objectives of the study were as follows.

i. To determine the relationship between investment management and self- sufficiency of Lelan Dairy Cooperative.
ii. To investigate the link between expenditure management and self-sufficiency of Lelan Dairy Cooperative.
iii. To examine the association between staff productivity and self-sufficiency of Lelan Dairy Cooperative.

1.4 Research Questions

i) What is the relationship between investment management and self-sufficiency of Lelan Dairy Cooperative?
ii) What is the link between expenditure management and self-sufficiency of Lelan Dairy Cooperative?
iii) What is the association between staff productivity and self-sufficiency of Lelan Dairy Cooperative?

1.5 Scope of the Study

The study focused on the effect of operational efficiency on self-sufficiency of dairy cooperatives. The research was conducted in West Pokot County with a focus on Lelan dairy

cooperative as the case study. The timeframe of the study was September 2019 to June 2020. Secondary data was collected from audit reports of the cooperative for the last 5 years. Having been established in 2010, Lelan Dairies has maintained books of accounts since 2012. However, the last six years has seen the organization increase capacity from 2 collection centers to 11 and increase staff base from 25 to current 78. This period was therefore considered enough to adequately make analysis and conclusions as per the objectives of the study. Apart from the secondary data, primary data was collected through questionnaires that were administered to the general manager, the directors of the organization, employees, and members of Lelan Dairy.

1.6 Significance of the Study

The study explored the effect of operational efficiency on self-sufficiency of dairy cooperatives in Kenya and generated information on the how various aspects of operational efficiency affects self-sufficiency of dairy cooperatives. The findings are significant in offering useful insights to practitioners in the dairy value chain including the cooperatives on appropriate strategies and best practices on utilization of resources for maximum value and output to achieve both operational efficiency and self-sufficiency.

The findings are also important to cooperatives dealing with other agricultural commodities and various stakeholders and actors such as development organizations in understanding areas of improvement and support to the cooperatives in achieving competitiveness in the dairy and agricultural sector at large.

Further, the results provide baseline data to inform policy makers including the national and county governments on the policies, regulations, strategies, and development approaches they should invest on to provide an enabling environment which improves the operational efficiency and self-sufficiency of farmer cooperatives. Hence, the study results are useful in formulation and implementation of infrastructural and fiscal policies, strategies, and programmes. Hence, the study will be of value to policy, practice and academic.

Besides, the study findings provide recommendations to scholars and researchers for further research/ future studies on issues of operational efficiency and overall sustainability/sufficiency of dairy cooperatives and other organizations in Kenya which could be undertaken to fill important knowledge gaps.

1.7 Organization of the paper

This research paper comprises five main chapters. Chapter one presents the introduction to the research comprising of the background, statement of problem, objectives of the study and the significance of the study. This introduction is followed by Chapter 2, a literature review of the empirical and conceptual issues of the conventional economic efficiency theory and Lean manufacturing theory. Chapter 3 outlines the research design used, its target population and sample selection, research instruments and methods of data collection and analysis. Chapter four is a presentation of the study findings including descriptive statistics and correlation analysis. The last chapter provides a discussion and summary of the study findings while highlighting the recommendations, knowledge gaps and limitations of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter explored and reviewed extant literature on the effect of operational sufficiency (with a focus on investment management, expenditure management and staff productivity) on self-sufficiency in Dairy farmer cooperatives in Kenya. It is comprised of the following sub-sections: introduction on background to farmer cooperatives and operational efficiency, theoretical and empirical review of the study and a conceptual framework on which the study is founded. The empirical review explored different studies that have been previously conducted on the research topic. The chapter also did a critique of the existing literature with identification of the research gaps and provided a summary of the chapter.

2.2 Theoretical Review of Literature

The study is focused on operational efficiency and its effect on self-sufficiency. Efficiency may be defined as the quantity of resources used per output unit (Picincu, 2018). In this proposal, the review focuses on operation's management which entails control of production processes and business operations in the most resource efficient manner while endeavoring to meet the customer needs in the highest possible standard (McClay, 2019). According to McClay 2019 operational efficiency entails maximum use of available resources including raw materials and labour to create high quality products and services.

This study was founded on two theories namely conventional economic efficiency theory and lean manufacturing theory.

2.2.1 Conventional Economic Efficiency Theory

Convectional economic efficiency theory originated from the works of Vilfredo Federico Damaso Pareto who was an Italian economist in the period between 1848 – 1923 (Sickles & Zelenyuk, 2019). The basic principle of this theory is that an economy thrives when resources are optimally allocated to the members of the economy and are utilized in a manner that reduces

waste and inefficiency (Thomas, 2013). This theory later led to the development of classical economics by Adam Smith, in the late 18th Century.

According to Aly et. al., (1990) the theory proposes that organizations should strive to produce goods and services at the lowest cost per unit possible. It indicates that benefits are accrued from economies of scale where existing systems are used repeatedly (Odunga, 2014). According to the theory, optimum production is possible through economies of scale which is evident in agricultural cooperatives where members pool their synergy and resources together to achieve a certain goal.

The conventional economic efficiency theory is divided into allocative/price efficiency criteria and productive(technical) efficiency criteria. According to this theory, maximum allocation efficiency is achieved when an organization in business produces maximum output of a collection of goods and services and optimizes the benefit to the business. The theory proposes that resources are limited and can only be exploited once with the utilization involving an opportunity cost hence, they must be utilized efficiently (Said, 2012).

On the other hand, the technical efficiency is concerned with engagement of the entire resources proficiently to achieve maximum output from the lowest inputs (Miller et al., 1996). Technical efficiency calls for the managers of a business to utilize strategies that ensure efficiency in all the business component (Quinzi & Sujaya, 1993). According to this theory, a firm's operational efficiency is characterized by increased profit values in a competitive market.

This theory has been critiqued by authors such as Kara (2009) who argues that it is based on preference ordering where it is assumed that the preferred unit is non-contradictory and representative. Kara (2009) continues to argue that the theory utilizes unidimensional inclination to conclude on the rational course of selection which is sometimes unacceptable since human behavior and business world is complex -this calls for different criteria of selection and judgment. However, Kara (2009) also provides a constructive criticism on the theory which

argues that utility functions are hard to obtain in the absence of unidimensional approach of efficiency. This theory is applicable in the study because investment management calls for adoption of practices and systems that ensure assets and finances which are key resources are utilized efficiently to meet investment goals. On the other hand, the theory is relevant to expenditure management which is an objective of this study because organizations need to have systems in place that ensure that expenditure do not exceed revenues and guarantee effective and efficient payments of all forms.

2.2.2 Lean Manufacturing theory

Lean manufacturing theory dates way back in the 1450s in Venice and was later integrated in the manufacturing industry by Henry Ford. This theory was initially integrated in Toyota production system to enhance the efficiency and effectiveness of process performance (*Matthias, 2007).* The overall goal of lean manufacturing theory is to maximize value for consumers while reducing wastage to the highest extent possible (Womack & Jones, 2003).

The theory is applicable in modern operations management which calls for control of processes in a firm to optimally utilize raw materials, labor and energy for conversion of raw materials into quality goods and services that meet customer requirements (McClay, 2019). Besides, farmer cooperatives must be able to offer high prices to their members despite a competitive business environment where dominant market processors exist (Gill et al., 2014). The lean manufacturing theory proposes the need for systematic elimination of resources' waste in the production, processing, and manufacturing processes (Levinson, 2016). According to the theory, resource should only be used for creation of value to customers and not for any other reason (McClay, 2019).

This theory is relevant to the current study which focusses on operational efficiency of farmer cooperatives. The theory is applicable to the study objective on staff productivity which basically aims to optimally utilize labor or staff efforts, energy and time as inputs to offer quality goods

and services to customers in this case cooperative members. Besides, the theory is also applicable in investment and expenditure management which all call for efficient use of resources to maximize on profits and achieve investment goals.

2.3 Empirical Review of Extant Literature

Various studies on operational efficiency have been conducted focusing on different institutions. Kang'ethe (2009) conducted a study on 'to investigate the relationship between operational efficiency and growth of Commercial Banks in Kenya'. The study adopted descriptive research design to evaluate how operational efficiency affects growth with the findings revealing that growth is greatly determined by efficiency. Odunga (2014) explored the determinants of operational efficiency with a focus on commercial banks in Kenya which assessed 'the effect of capital adequacy, credit risk, liquidity, profitability and asset quality on the operational efficiency. This study was guided by the efficiency theory and utilized an explanatory research design with the researcher collecting secondary data from the annual financial statements and reports of 43 commercial banks in Kenya. The results of the study showed that capital adequacy, credit risk, profitability and asset quality were all significantly related to operational efficiency. The study recommended that there is need for 'bank regulators and managers' to regulate these factors for them to preserve their competitive edge in the market. Odunga (2014) also recommended that researchers ought to explore how other non-bank specific performance indicators affect operational efficiency.

Ndolo (2015) also did an investigation of the relationship between operational efficiency and financial performance of firms listed at the Nairobi Securities Exchange focusing on five variables namely financial leverage, size of the firms, liquidity, capital adequacy and interest rates to assess their association with return on assets of the various firms. The study utilized descriptive research design for data collection with the researcher collecting secondary data from the annual reports of the companies. The findings of the study revealed that there is a positive relationship between operational efficiency and return on assets of the firms assessed during the

study. The recommendation of the study was that there is need to control fluctuations on factors of operational efficiency such as size of the firm, capital adequacy, interest rates, and liquidity because they are key determinants of return on assets.

Sporta et al. (2017) also did an analysis of operational efficiency as a financial distress factor and its relationship with financial performance where the results showed that there is a positive association between operational efficiency and financial performance.

Another study by Kamau (2018) focused on investigating the capacity management strategies and operational efficiency with a focus on the energy sector in Kenya to identify strategies of improving operational efficiency. A study by Kinyanjui et al. (2018) sought to assess the impact of mobile credit on operational efficiency focusing on Commercial Banks in Kenya. This study used various operational efficiency performance indicators including return on assets, earnings per share and fraction of non-performing loans. The findings of the study revealed that technology plays an important role in improving operational efficiency of banks and thus other organizations should strive to utilize technology.

Okwang'a et al. (2015) also did an analysis of the factors that influence operational efficiency of Jua Kali Sector with the aim of exploring the effect of management factors and financial resources on operational efficiency. The study found out that most of the Jua Kali enterprises do not prioritize operational efficiency to be one of their objectives

Some studies focusing on agricultural cooperatives have also been done. Rotan (2001) studied the impact of local farm supply marketing cooperatives using ratio analysis. The study employed the following ratios: liquidity ratios-current ratio (current assets/current liabilities), leverage ratios-debt ratio, activity ratios-total-asset-turnover ratio and profitability ratios-return on total assets ratio. Though this focused on cooperatives, its focus was different and did not focus on effect of operational efficiency on self-sufficiency. Chesnick (2000), also did an investigation on

financial management and ratio analysis for cooperative enterprise and identified some ratio to analyze the cooperative's financial performance and cash flow analysis to develop its own performance measurements. Wanjiku (2015), also explored the factors that influence growth of dairy industry in Kenya using a case study of Githunguri Dairy Farmers cooperative society. The findings of this study revealed that tax policy, politics, and government support are some of the key factors that affect growth of Dairy cooperatives in Kenya. The study recommended that both governments and politicians should provide supportive /enabling regulatory environment including tax policies that propel continuous growth of dairy farmer's cooperatives.

In addition, Mwangi (2013) conducted a study to determine factors that influence the performance of dairy cooperative societies in Kenya. The study focused on dairy cooperatives located in Mathira and Kieni Sub-Counties in Nyeri County. This study adopted a descriptive survey design where data was collected using questionnaires and interview guides. The results of the study indicated that competitors (middlemen and milk vendors), staff training and provision of services such as credit and artificial insemination were some of the significant factors that affected performance of dairy cooperative societies in the County. The study recommended that dairy cooperatives needed to engage in aggressive marketing, value addition and provide support services to their members to remain competitive. Njoroge (2017) also did an investigation of the challenges which are faced by smallholder dairy farmers in Kirinyaga County which adopted a descriptive survey design. The results of the study indicated that low productivity, diseases and pests and unavailability of animal feeds were some of the key challenges that dairy farmers were facing in the County.

Giel et al. (2017) conducted a comparison study of the institutional environments of dairy cooperatives in Kenya and Morocco to establish their relationships. The study established that dairy cooperatives in both countries face various organizational challenges such as quality control systems regarding milk quality and payment systems. The study recommended the need

for relevant stakeholders to collaborate in strengthening internal structures and creating enabling policies for the dairy cooperatives.

2.3.1 Self –Sufficiency as a fundamental aspect in an organization

Self-sufficiency can be defined as the capacity or capability of an organization to drive organizational activities and objectives without external support (Murphy, 2020). It is the ability of an organization to meet its own needs and goals using its own resources without requiring the financial or any other support from other sources (Hayes, 2019). The current market is so dynamic that organizations that yearn to remain competitive enough require to be able to make profit using their own resources. Self-sufficiency is concerned with utilizing resources well so that maximum profit is yielded. The resources of interest include both financial resources and employees/staff being a fundamental asset and driver of an organization's operations and activities (Hayes, 2019).

A self-sufficient organization meets its present needs while maintaining its capacity to meet its goals in the future (Reilly & Brown, 2014). According to Murphy (2020), being self –sufficient means being self-adequate. It is the ability of an organization to meet all its financial and operational needs and costs on its own (Reilly & Brown, 2014). Self-sufficiency implies both financial and operational sufficiency.

Financial self-sufficiency is a measure utilized in evaluating if the company can generate enough revenue to cover its costs while ensuring that the equity value is sustained, after incorporating inflation, and another cost of capital (Murphy, 2020). This study focuses on self -sufficiency as evaluated through financial self-sufficiency and operational self-sufficiency. The financial self-sufficiency perspective assesses how the business manages its member value and whether investments made are best utilized (Sahid and Amir, 2017). Financial self-sufficiency can be determined through measures such as working capital turnover ratio (WCTOR), which assesses how well a company is utilizing its working capital to support a given level of sales (Sahid and

Amir, 2017). On the other hand, operational self-sufficiency of an organization can be evaluated through Operational Expense Ratio (OER). This is a ratio of an organization's expenses to its revenue. OER shows how efficient a company's management is at keeping costs low while generating revenue or sales (Murphy, 2020).

When the other cooperative characteristics including Asset quality, Membership contributions, Turnover and Dividends/bonuses are held constant, a decrease in efficiency ratio is positive as it indicates increased efficiency while a high efficiency ratio is a negative indication of decreased efficiency in an organization regardless of whether it is of operational or financial nature (Odunga, 2014). Okumu and Oyugi (2016) in a study to examine factors influencing performance of Sacco's in Kisumu County, revealed a positive and significant relationship between asset quality and Sacco performance. The study concluded that there is need to enhance the asset base of Sacco as such to foster superior firm performance. This study adopted self-sufficiency as evaluated through both financial and operational sufficiency which are measured through WCTOR and OER respectively further elaborated under sub-section 2.6.1.

2.4 Summary /Critique of literature

Several of the existing studies on operational efficiency in Kenya have focused on the banking sector specifically the commercial banks (Kinyanjui et al., 2018; Odunga, 2014; Kang'ethe, 2009). These studies have largely focused on factors that operational efficiency and the relationship between operational efficiency and performance (organizational and financial performance). These studies are different from the current study in that their focus is in the banking sector while the focus of this study is on farmer cooperatives. Other studies that have been conducted in the research area of operational efficiency focused on Juakali sector (Okwang'a et al., 2015) and energy sector (Kamau, 2018). In addition, the previous studies on farmer cooperatives focused on impact of marketing cooperatives using ratio analysis, financial management and factors that influence growth in farmer's cooperatives (Rotan, 2001; Chesnick, 2000; Wanjiku, 2015). Thus, it is evident that there is no previous study that have focused on the

effect of operational efficiency on self-sufficiency of Dairy cooperatives in Kenya which is the focus of this study.

2.5 Research gaps

From the summary of the existing literature on operational efficiency and previous empirical studies, it is evident that there has been no study focusing on operational efficiency of dairy cooperatives in Kenya which is the research gap that this study seeks to fill. Various studies that have been conducted previously are elaborated in Table 2.1 with their objectives and gaps highlighted.

Table 2.1: Summary of Research Gaps

Study	**Topic/Objective**	**Findings**	**Gap**	**How current study addressed gap**
Kinyanjui et al. (2018)	To assess the impact of mobile credit on operational efficiency in Commercial Banks, Kenya.	The findings of the study revealed that technology plays an important role in improving operational efficiency of banks	The study did not focus on investment and expenditure management and staff productivity as indicators of operational efficiency performance. It focused on return on assets and share earnings. The study focus was	This study assessed the effect of investment and expenditure management and staff productivity as indicators of operational efficiency on self-sufficiency. The focus of current study was dairy cooperatives

			in commercial banks The study did not focus on dairy cooperatives	
Kamau (2018)	To explore how capacity management strategies, affect and operational efficiency in energy sector in Kenya	The findings showed that good management strategies improve operational efficiency.	The focus was on the energy sector in Kenya while the focus of the current study is the dairy sector.	This study assessed how different aspects of operational efficiency affect self-sufficiency of dairy cooperatives.
Okwang'a et al. (2015)	To analyze factors that affect operational efficiency in Jua Kali Sector in Kenya.	The study results showed that majority of the Jua Kali enterprises do not rank operational efficiency as an important aspect of their businesses.	The research explored management factors in general and financial resources on operational efficiency.	This study was specific to analyze the effect of investment and expenditure management (as indicators of operational efficiency) on self-sufficiency.
Sporta et al. (2017)	An analysis of operational efficiency as a	The results showed existence of a	The research was not specific to dairy cooperatives.	The current study explored how different aspects of

	financial distress factor and its relationship with financial performance	positive relationship between operational efficiency and financial performance.	Besides, it explored the link of operational efficiency to financial performance unlike the current study which seeks the influence of operational efficiency on self-sufficiency.	operational efficiency influenced self-sufficiency in dairy cooperatives.
Mwangi (2013)	To determine factors that influence the performance of dairy cooperative societies in Mathira and Kieni Sub-Counties in Nyeri County, Kenya.	The results indicated that competitors, staff training and provision of support services are important significant factors affecting performance of dairy cooperatives.	The focus of this study was on performance of dairy cooperatives in Nyeri, County while the current study focuses on a dairy cooperative in West Pokot County.	The current study focused on operational efficiency which is a gap in Mwangi (2013) study.
Njoroge (2017) also did which	An exploration of challenges faced by	It was found that low productivity, diseases, pests,	The research did not focus on any of the operational	The current study focused on the influence of

adopted a descriptive survey design. The results of the study	smallholder dairy farmers in Kirinyaga County.	and unavailability of animal feeds were key challenges to dairy small holder farming.	efficiency variables (investment management, expenditure management and staff productivity) of the current study.	operational efficiency on self - sufficiency of dairy cooperatives.

From Table 2.1 on summary of gaps and the literature reviewed, previous studies on operational efficiency have focused on its effect on performance while none have explored the effect of operational efficiency on self-sufficiency. In addition, previous studies have used different operational efficiency indicators such as liquidity, capital adequacy, return on assets and return on equity. The current study investigated the influence of investment management, expenditure management and staff productivity on operational efficiency and ultimately self-sufficiency of dairy cooperatives in Kenya, an area that have limited research. The current study generated evidence-based findings to add onto the existing knowledge and fill the research gap that exists in the research area.

2.6 Conceptual Framework

The research objective in this study was to determine the effect of operational efficiency on self-sufficiency (both operational and financial sufficiency) of farmer cooperatives. The study adopted specific operational efficiency indicators including staff productivity, expenditure management and investment management in the farmer cooperatives using a case study of Lelan Dairy Cooperative.

Figure 2.1 shows the conceptual framework of the study which highlights the influence of the independent variable namely operational efficiency on the dependent variable, in this case the self-efficiency of dairy cooperatives.

Independent variable **Dependent variable**

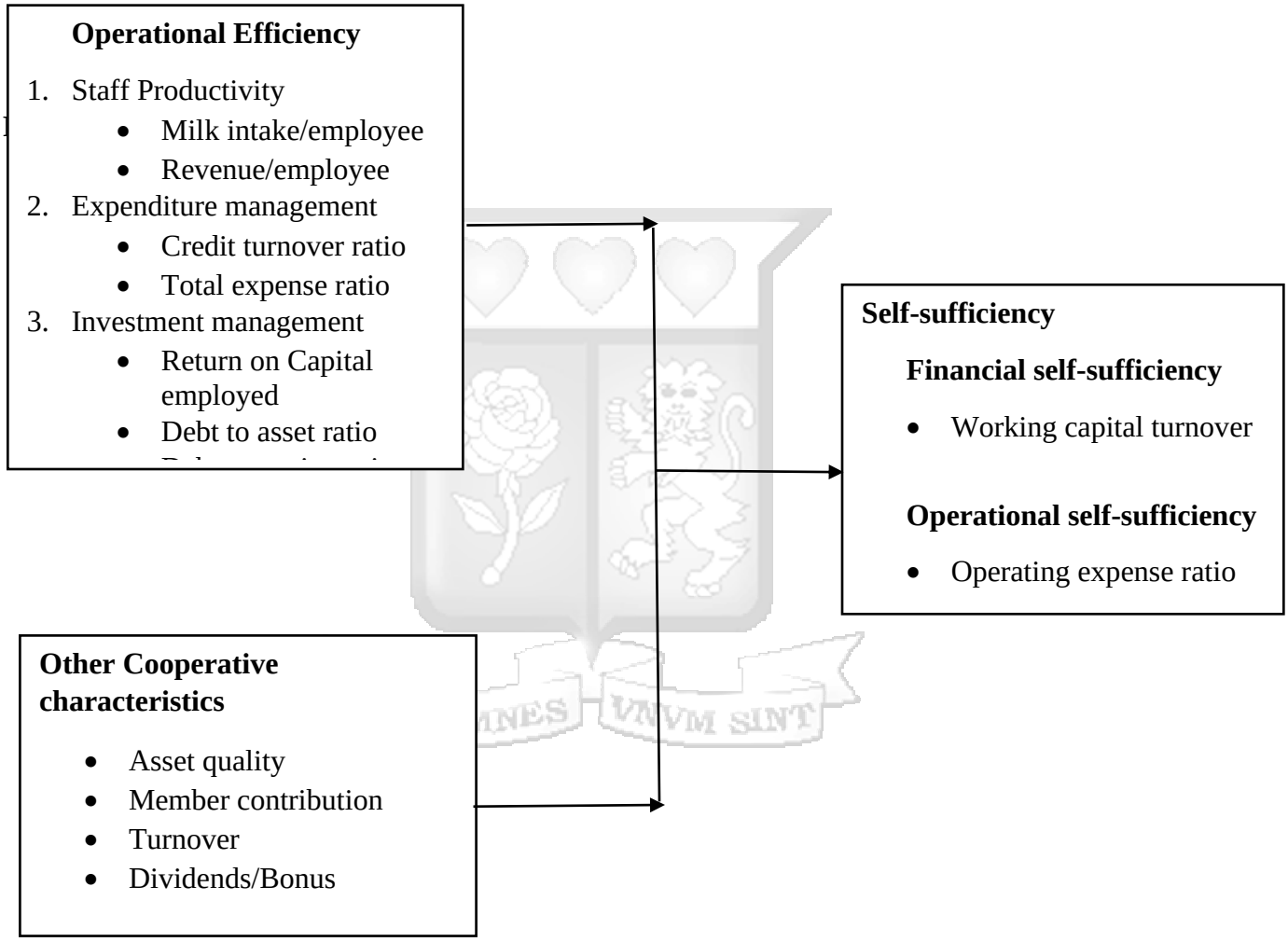


Figure 2. 1: Conceptual Framework

2.6.1 Operationalization of Variables

The dependent variable in the study was self -sufficiency which was evaluated through two variables namely financial self-sufficiency and operational self-sufficiency. Financial self-sufficiency was determined through measures such as working capital turnover. In this case the measure used is working capital turnover ratio (WCTOR), which assesses how well a company is utilizing its working capital to support a given level of sales. In this case the following formula was used:

WCTOR = *net sales* ÷ by *average amount of working capital* (Sahid and Amir, 2017)

The operational self-sufficiency of the cooperative was evaluated through Operational Expense Ratio (OER) which is determined as shown below:

OER= Operational expenses ÷ Revenues.

The indicators of operational efficiency in the study are staff productivity, investment management and expenditure management. Staff productivity was determined through the labor productivity equation which quantitatively measures productivity by the number of products produced by an employee within a specific duration of time; total output / total input. The following formulae was adopted: *Staff productivity =Total Output /Total Input.* The output was measured by the volume, quantity or financial value of products/services produced by the employees in the cooperative while the input was the duration of time/labor hours used in producing the products or services.

Investment management as a variable was operationalized by evaluating the investment management structures of the cooperative. The researcher explored both asset and financial investment management structures, the risk and opportunities of the cooperative, the co-investments, and partnerships of the cooperative with the ultimate objective of assessing the efficiencies in investments made by the cooperative. The researcher was keen to assess the investment management delegation structures implemented by the cooperative if any. The

measures of investment management included: capital employed, which gives a snapshot of how a company is investing its money; Debt to Asset ratio which tells the percentage of a company's total assets that were financed by creditors; and Debt to Equity ratio which indicates the relative proportion of shareholders' equity and debt used to finance a company's assets (Hayes, 2019).

Regarding expenditure management, the study assessed the systems and procedures that are in place to ensure effective, efficient, and timely payments in the cooperative. The evaluated the fiscal discipline in the cooperative regarding alignment of expenditures to the revenues of the cooperative, adherence of budget allocations to strategic priorities and in general maintaining the cooperative spending within sustainable limits. In this case the expenditure management was assessed through Credit turnover ratio which measures the number of times, on average, the accounts payable is paid during a period and total expense ratio which is a measure of the total costs associated with managing and operating a fund (Hayes, 2019)

Staff productivity, expenditure management and investment management are not the only factors that determine self-sufficiency of cooperatives. Besides these factors: Asset base, member contribution, turnover and dividends/Bonus cannot be entirely ignored as they have an indirect influence on the self-sufficiency of an organization.

Table 2. 1: Operationalization of Variables

Objectives	**Variable**	**Definition of variable**	**Indicator/s**	**Measurements**	**Data analysis**
To determine the effect of investment management on the self-	**Independent** Investment Management	The practice of managing both securities (such as shares and bonds) and other assets of an organization to meet the investment goals of the	-Return on capital employed	-Non-current assets/Working capital	Ratio analysis. Correlation tests.
			-Debt to asset ratio	-Total debt/Total assets	
			-Debt to	-Total	

sufficiency of Lelan Dairy Cooperative.		investors (Gathungu, 2015).	equity ratio	liability/Shareholders equity	
To investigate the effect of expenditure management on the self-sufficiency of Lelan Dairy Cooperative.	Expenditure Management	Entails procedures that uphold fiscal discipline regarding alignment of expenditures to the revenues, adherence of budget allocations to strategic priorities (Ganti, 2019).	- Total expense ratio	-Total operating expenses/Total revenue	Ratio analysis. Correlation tests.
			-Credit turnover	-net credit purchases/average accounts payable.	
To examine the influence of staff productivity on self-sufficiency of Lelan Dairy Cooperative.	Staff productivity	The competency and skillfulness of the staff in an organization that leads to operational and even financial efficiency.	-Ratio of total output to total input per staff	-Total milk volumes/Total number of employees -Total sales/Total number of employees	Ratio analysis. Correlation tests.
Self-sufficiency of dairy cooperatives	**Dependent** Financial self sufficiency Operational self sufficiency	Capacity to drive organizational activities and objectives without external support.	-Working capital turnover ratio	-Sales/Average working capital	Ratio analysis. Correlation tests.
			-Operating expense ratio	-Operating expenses/Revenues	

Source: Researcher (2020)

2.7 Summary of Chapter

This chapter reviewed relevant literature on operational and self-sufficiency of farmer cooperatives based on the specific objectives of the study (that revolved on staff productivity, expenditure, and investment management) while reviewing theories that support the study. The conceptual framework adopted in the research is also presented with a discussion of the study variables and how they were operationalized. The chapter also provides a discussion of previous empirical studies related to the research topic and a critique of the existing literature with a comparison and contrast of this literature drawing relevant conclusions from it. The research gaps that the study sought to fill are also highlighted in the chapter.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter described the research philosophy and design used for the study, target population of the study, sample selection, research instruments and methods utilized in data collection and data analysis.

3.2 Research Philosophy

Research philosophy is described as a researcher's belief about the way data about a phenomenon under investigation ought to be gathered, analysed, interpreted and findings utilized. (Edirisingha, 2012). According to Black (2006) research philosophy is a particular way of viewing the world which determines our method of seeking answers to research questions. Therefore, philosophy of a study determines the research methodology and research instruments to be employed to achieve the set research objectives. This study adopted interpretivism research philosophy which argues that it is only through subjective interpretation of data about a phenomenon in their natural settings that objective findings can be realized (Carson, et al., 2001). The study attempted to describe relationship that exist between different variables affecting a specific phenomenon (self-sufficiency) using a single organization namely Lelan Dairy cooperative.

3.3 Research Design

The study utilized descriptive research design which is an appropriate research design for collection of data for illustration of current trends and associations between variables at a specific period (Creswell & Creswell, 2017). The research specifically used case study method which according to Harrison (2017) is a research method that enables the researcher to explore and understand complex issues/phenomenon through in-depth contextual analysis in their real-contexts. The researcher conducted in-depth investigation of operational efficiency through staff productivity, investment management and expenditure management of Lelan Cooperative. The analysis was further intertwined with thick contextual descriptions of the opinions/views of the

employees, managers, and members of the cooperative as well as literature review of past studies.

3.4 Population and Sampling

According to Lewis (2015), the target population refers to the totality of the entire members, subjects or objects that share characteristics that are of interest to the researcher. The target population of the study was 5,313 registered members of Lelan Dairy Cooperative in West Pokot County who deliver produce to the 11 cooling centers of Lelan Cooperative in West Pokot County.

A sample (n) is a representative portion of the target population that is normally smaller in size (Bryman & Bell, 2015). Sampling is the process of selecting a smaller number of individuals, subjects, objects to represent the population in the study (Bryman and Bell, 2015). The purpose of sampling is to gain understanding about some features or attributes of the whole population based on the characteristics of the sample (Merter, 2018).

Yamane (1967) as cited in Ajay & Micah (2014) offers a formula to calculate the sample size of a study which was adopted by this study. The sample size was determined using the formulae shown below.

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

Where, n= sample size

N = target population size

e= level of precision (0.05 at 95% confidence level)

$n = 5313/1 (+ (5313)0.05^2$

$n = 5313/1+13.2825$

$n = 5313/14.2825$

$n = 371.99$

$n = 372$

The study administered questionnaires to a sample of 372 cooperative members selected through random sampling which included staff members. There was a response rate of 70% which translated to 261 respondents.

3.5 Data Collection Methods

The study employed triangulation data collection method, which involves the use of several approaches when investigating a research question to enhance confidence in the ensuing findings (Bryman, A 2006). The research utilized both primary and secondary data collection methods. Primary data was collected from the members of the cooperative by use of structured questionnaires that captured quantitative data on the study variables (investment management, expenditure management, staff productivity and self-sufficiency. Secondary data from that included cooperative documents was used to complement the primary data. Questionnaires were administered to cooperative members and key informant interviews conducted with managers/leaders of the head office and branches (collection centers) to gather data. Data collected was then coded and organized for analysis. Secondary data was also collected through literature review where the cooperative's annual financial reports, bi-annual and quarterly accounting reports, annual general meetings' reports, relevant publications, and other relevant documents were reviewed to gather data on expenditure, investment, and staff productivity in Lelan Dairy Cooperative. Data was collected by reviewing documents developed by Lelan Cooperative in the last 5 years was utilized to answer all the research questions by using it for the relationship testing.

3.6 Data Analysis

The data collected during the study was analyzed using Statistical Package for Social Sciences (SPSS). All the questionnaires were referenced and coded to facilitate data entry. Analysis was done using descriptive statistics, thematic and content analysis. The descriptive statistics analyzed included frequency distribution tables, percentages, bar graphs and pie-charts. Spearman's correlation test was undertaken to establish the relationship between the independent and the dependent variables. For qualitative data, thematic analysis where key thematic areas based on context and relevance were identified and used in categorizing the data into themes based on study objectives. Content analysis where key content emerging from the themes was also undertaken to complement information from quantitative data. The study reviewed relevant documents including previous financial/accounting and human resource documents of the cooperative. The data in the documents was divided into units of analysis (staff productivity, asset management and expenditure management) based on the objectives and was examined to identify patterns, themes, and indicator values of each of the variables. Average values of each of the variable indicators were calculated and the results used in calculation of different financial ratios and in Spearman's coefficient of correlation test using the formula below.

$$R = \text{Covariance} / (X_{Ra} \text{ St. Dev.} * Y_{Ra} \text{ St. Dev.})$$

Where:

X = Overall operational efficiency (average of total activity ratios in independent variables)

Y= Overall Self-sufficiency (average of measured total OSS and FSS)

X_{Ra} = Ranks of X Values

Y_{Ra} = Ranks of Y Values

$X_{Ra} - M_x$ = X rank minus mean of X ranks

$Y_{Ra} - M_y$ = Y rank minus mean of Y ranks

Sum Diffs = $(X_{Ra} - M_x) * (Y_{Ra} - M_y)$

3.6.1 Diagnostic tests

3.6.1.1 Normality Tests

Normality tests are used to establish if a data set is well-modelled by a normal distribution and to calculate how probable it is for a random variable governing the data set to be normally

distributed (Denzin & Lincoln, 2008). Normality test was conducted to deduce whether the shape of the sample distribution mirrored the shape of a normal curve. The study utilized the Shapiro-Wilk tests. As a rule of thumb for any data to be normally distributed, the Shapiro-Wilk test dictates that all the significant value should be above 0.05.

3.7 Research Quality

The quality of this research was founded on two pillars namely reliability and validity (Flick, 2014). Validity refers to the precision and relevance of results obtained from analysis about the research objectives or the extent to which data gathered truly represent the phenomenon being investigated (Merter & Reinhart, 2016). A pilot study was undertaken involving 37 employees and members of Lelan cooperative to pre-test the validity of both the interview schedule and questionnaire. According to Flick (2014), a sample size ranging between 5-10% of the study sample is considered satisfactorily representative in a pilot study. The study sample was 372 hence a pilot sample of 37 respondents was adopted. The research instruments were then reviewed to eliminate questions that were ambiguous. The quality of secondary data was ensured by using published documents and ensuring that the company documents reviewed were certified by the cooperative's management.

Reliability is a measure of the extent to which a research instrument yields consistent results even after recurrent trials (Merter & Reinhart, 2016). According to Whitehead, et al. 2015, reliability coefficient of a research instrument can be assessed using Cronbach's alpha (α). The study utilized Cronbach's alpha computation to test the reliability of the instrument using the following formulae.

$$A = k/k\text{-}1 \times [1-\sum (S^2) / \sum S^2 sum]$$

Where: α= Cronbach's alpha.

k = Number of responses.

$\sum (S^2)$ = Variance of individual items summed up.

$\sum S^2 sum$ = Variance of summed up scores

The results of the validity and reliability tests as computed using the Cronbach coefficients of the two variables namely operational efficiency and self-sufficiency after computation were as depicted in Table 3.1.

Table 3.1: Cronbach's Coefficient Table

Variable scale	Cronbach's Coefficient(α)
Operational efficiency	0.884
Self-Sufficiency	0.910

Cronbach coefficient value of 0.70 is usually considered as the standard minimum value that is acceptable for assessment of reliability (Diedenhofen & Musch, 2016). Therefore, it was observed that the variable scales used in the study were both reliable.

3.8 Ethical Issues in Research

The researcher upheld ethical guidelines and procedures throughout the research process. All the academic work used in referencing during the proposal development and report writing was acknowledged to avoid plagiarism. The researcher sought a research permit from NACOSTI to ensure the research was licensed to be conducted. The researcher also sought clearance from the Ethical Review Body of Strathmore Business School for authorization to carry out the research. Further, the researcher explained to the individual participants of the study the purpose of the study and that the information collected was not to be used in any harmful way. Besides, codes were used as identifiers of the questionnaires to avoid use of personal identifiers (such as names). Besides, only willing respondents participated in the study and there was freedom for voluntary withdrawal from the study.

CHAPTER FOUR: ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter provides an overview of analysis, presentation, and interpretation of findings of the study based on the study objectives. The study results are presented in tables, graphs, and pie charts. The analyzed data is organized in various thematic areas as the study objectives. The chapter is presented in different subsections including response rate; reliability and validity; descriptive statistics including demographic of respondents and the findings of the three study objectives that focus on the effect of investment management, expenditure management and staff productivity on self- sufficiency in Lelan Dairy Cooperative.

4.2 Response Rate

The study's total sample size was 372 cooperative members. On administering the questionnaire to them, 261 members filled and returned it comprising 70% response rate. According to Babbie (2015) a return rate that is between 50-70% is acceptable for both analysis and publishing. Therefore, the research was considered to have achieved an acceptable response rate. This is further illustrated in Table 4.1.

Table 4. 1: Response Rate

Response	Total	Percentage
Returned	261	70%
Unreturned	111	30%
Total	372	100

4.3 Diagnostic test

The study utilized normality test to assess whether the shape of the sample distribution emulated the normal distribution curve.

4.3.1 Normality test

Normality test was conducted to determine normality in distribution. According to Jumi (2019) in circumstances where data sets are less than 2000, the Shapiro-Wilk tests is adopted. From the correlation findings presented in the correlation matrix table above, the significance value for all the variables was greater than 0.05 implying that there was normal data distribution. They were 0.104, 0.380 and 0.120. As a rule of thumb for any data to be normally distributed, Shapiro-Wilk test reveals that all the significant values should be above 0.05.

4.4. Demographic information of respondents

The findings of the study indicated that majority 57 % of the respondents were male with females being 43%. This implies that majority of members in Lelan Dairy Cooperative are men. This agrees to the finding of Woldu, et al. (2013), who revealed that in most developing countries, female farmers are marginalized in farmer cooperative membership, leadership, and management despite them being the majority in offering labour to the agricultural sector.

Regarding age, the modal age category of the respondents in the study was 36-60 with 61% of the respondents falling in this category. 36% of the respondents were between 18-35 years while 3% were above 60 years of age. According to (AGRA, (2019), the average age for a Kenyan farmer is 60 years which agrees to the finding of this study. However, the results of the study also show that youthful farmers have also adopted farming in the recent past a finding that is in congruence with the findings of AGRA (2019).

The study also sought to find out the education level of the respondents. 40% of the respondents in the study had attained secondary education while 25% of them had undergone tertiary education. The results showed that 19% of the respondents had no formal education with 16% of the respondents having attained primary education. The demographic of the respondents is further demonstrated by Figure 4.1.

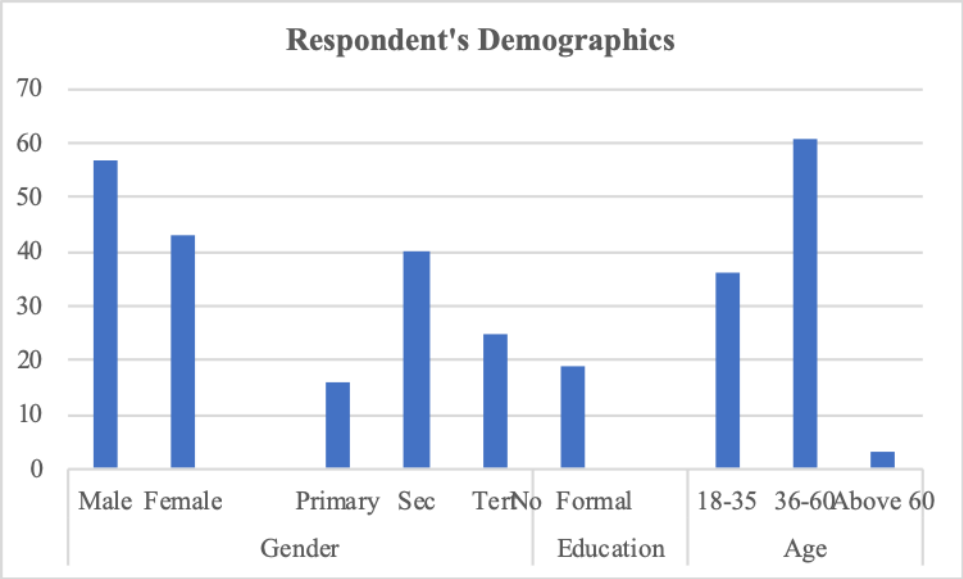


Figure 4. 1: Respondents Demographics

4.5 Descriptive statistics

This section provides descriptive statistics of the data and information that was obtained from the responses of Lelan cooperative members. It presents the responses of the members as obtained from the questionnaires inform of percentages and graphs.

4.5.0 Findings of Objective 1: Investment management and self- sufficiency

4.5.1 Investments and Assets of Lelan cooperative

The study sought to find out what investments that the cooperative had made in the previous five years. The findings revealed that Lelan cooperative have progressively invested in various assets from the year 2015 to 2019 as shown in the table 4.3.

Table 4.2: Lelan Investments

Investment	**Year (s)**
Land/Plots	2016
Tractors	2018, 2019
Milk coolers /tankers	2015, 2017,2018, 2019

Agrovets	2015, 2016, 2017, 2018, 2019
Generators	2017
Computers	2016

The analysis showed that the cooperative has made relevant investments that can enhance the wealth and competitiveness of the cooperative. According to Levisauskaite (2010) investment entails utilization of funds or finances to increase the investor 's wealth. Thuku (2019) asserts that investment is an activity of committing funds in either financial or physical assets in the present with the prospect of getting extra return in the future. The investor expects that the assets value will increase by a certain value which may also vary in actual value a phenomenon referred to as investment risk (Thuku, 2019).

The results of the study revealed that the cooperative has progressively made efforts on making real investments. In this regard, the findings indicate that the cooperative is more inclined to acquisition of tangible assets that have the potential of enhancing its competitiveness. It has focussed more on investment of assets including land, milk chillers, agrovets and tractors as opposed to financial investments. The findings established that the cooperative have invested towards chilling of milk (including assets such as milk tankers and coolers), improving member service delivery and competitive edge where the cooperative have invested in assets such as agrovets, tractors and land. This indicates that there is sound investment decision making in the cooperative because the assets invested in are relevant in ensuring competitiveness of the cooperative. According to Levisauskaite (2010), it is important to analyse the investment environment to identify the most appropriate investment at a particular point in time which is illustrated by the findings of this study.

However, the findings indicated that there was limited focus on financial investments including shares. According to the study results, only 34 % of the respondents interviewed were

shareholders in the cooperative while 66 % of them were only registered as members but had not invested in shares as shown by Figure 4.2.

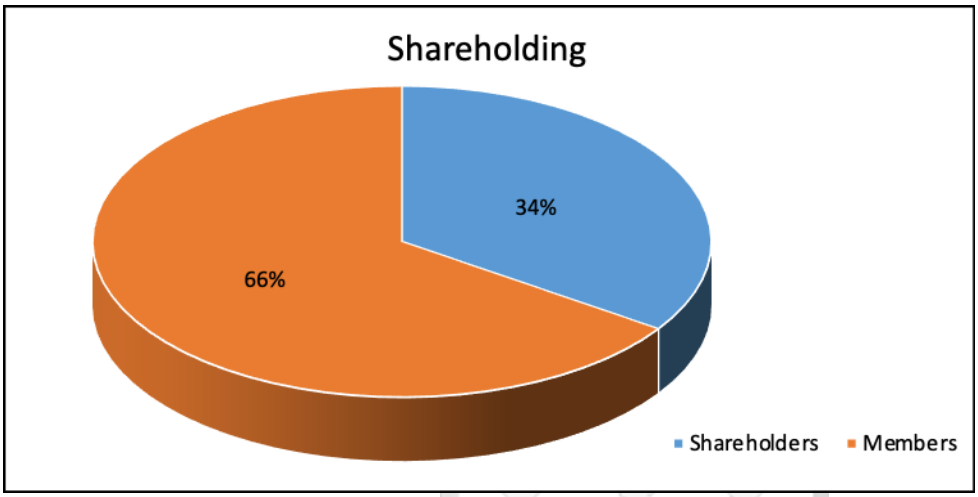


Figure 4. 2: Shareholding in Lelan Cooperative

It is worth noting that financial investments also include partnerships and collaborations between stakeholders and partners on working together normally defined by memorandum of understandings (MOUs) and contractual agreements (Levisauskaite, 2010). It should be noted that, none of the respondents involved in the study indicated the existence of contracts or MOUs with other stakeholders. This may be an indication that there is limited focus on partnerships and collaborations as a form of investment. Although the inclination of the cooperative towards real investment as compared to financial investments may be considered appropriate based on its operations, this could also be one of the missed opportunities for the cooperative (Cheptoo, 2018). This is because physical assets are not divisible and hence have a lower liquidity and longer holding time (Thuku, 2019). Aleksandrova (2018) asserts that financial assets are divisible and thus can be traded in small quotas a characteristic that makes their holding time shorter. When the characteristics of the two types of investments is considered, it can be argued that it is more appropriate to invest in financial assets. Cheptoo (2018) adds that financial

investments such as shares, and bonds have a higher liquidity or marketability besides their potential in increasing shareholder value and profitability of an organization.

4.5.2 Asset ownership models

The study sought to establish the ownership models of Lelan Cooperative and established that some assets were owned by Members only as indicated by 45% of the respondents while other assets were owned by both members and the cooperative Managers as revealed by 55% of the respondents. This is further illustrated in Table 4.4.

Table 4. 2: Asset ownership Models

Ownership model	Frequency(n)	Percentage
Members only	118	45%
Members and Managers	143	55%
Total(N)	261	100

It is worth noting that none of the respondents interviewed indicated an ownership model of both members and external partners an observation that further expounds that the cooperative has limited focus on partnerships as an investment and ownership model. This finding implies that Lelan Cooperative could be missing on the benefits associated with partnership and collaborations. According to Partnering Initiative (2020), there is increased ability to mitigate risks and access to a wider stakeholder base besides efficiency and effectiveness in a partnership working arrangement. Besides, there is enhanced sustainability of business impact and credibility when organizations work in partnership (Partnering Initiative, 2020). However, partners must also be able to manage risks involved including conflicts of interest and various implementation challenges (McQuaid, 2000).

4.5.3: Asset and Financial investment management structures of Lelan Cooperative

The findings of the study indicate that Lelan cooperative society have adopted an in-house investment management structure. The results showed that there is utilization of both direct delegation and mutual investment management of assets and funds in the cooperative society. According to Peterson, et al. (2011), in house investment management structure refers to a system where the investor takes the duty of making investment decisions internally normally through a committee of executives. The results of the study showed that Lelan Dairy Cooperative have adopted two governance frameworks of in-house investment management including internal managers and a hybrid of internal and external managers.

Some of the cooperative investments and assets are managed by cooperative managers only while others are jointly managed by both the cooperative managers and leaders of the cooperative as indicated by 57 % and 42% of the respondents, respectively. This is further illustrated in Table 4.5.

Table 4. 3: Investment Management Approach

Investment Management Approach	**No. of respondents (n)**	**Percentage (%)**
Cooperative Managers	149	57
Both Cooperative managers and Leaders	110	42
Missing	2	1
Total (N)	261	100

According to Reilly and Brown (2014), investment management can be undertaken through two basic structures and techniques including direct delegation and mutual fund/investment structures. The findings of this study indicate that the cooperative utilize the two structures where there is direct delegation on management of some of the assets/investments to managers and supervisors who are employed as the asset/fund managers and mutual investment

management by both managers and the cooperative leaders who are asset owners. The cooperative has offered the managers contracts to authorize them in managing their assets a finding that is in congruence with the view of Reilly and Brown (2014) who indicates that direct delegation investment management approach entails individuals and institutional investors entering into contracts directly with a manager or management firm to offer services.

According to Clark and Monk (2012) in house management is preferred by most institutions because of the "broken agency" challenge. Broken agency is described as a state where agents who bear immediate risks and gain immediate rewards are different from those that bear long-standing risks and gain long standing rewards (Clark & Monk (2012). Gallagher et al. (2016) categorizes in house investment management implementation and governance mechanisms into four including dedicated internal manager, hybrid internal and external manager, partnerships and co investments.

The findings of this study where Lelan cooperative is using a hybrid investment approach agrees with the view of Gallagher, et al. (2016) who reveals that there is an emerging trend of the utilizing hybrid structures of investment management with organizations using a mix of both in-house and delegated management. However, the findings of the study are in contrast with the findings of M'ariba (2018) who indicates that majority 80% of organizations particularly insurance companies utilize the delegated investment management structure for asset management.

4.5.4: Risks and Opportunities for investment and its management for Lelan Cooperative

4.5.4.1 Risks faced by Lelan Cooperative

The findings established that the cooperative is faced by different risks that need to be addressed to enhance its potential for both investments and returns while there exist various opportunities for the cooperative to exploit to increase investments. According to the findings of the study, insecurity, inadequate capital, and political instability are the three most important risks/challenges that hinder investment of Lelan Cooperative society. Majority (88%) of the

respondents cited insecurity as the main risk for investment with inadequate capital and political instability being cited by 48% and 19% of the respondents, respectively. Other risks that influence investments in the cooperative are weak social capital (with lack of cooperation and stakeholder support) as well unconducive weather and market monopoly (which affects milk pricing) which were cited by 3% and 1% of the respondents, respectively. This is further illustrated by Figure 4.3.

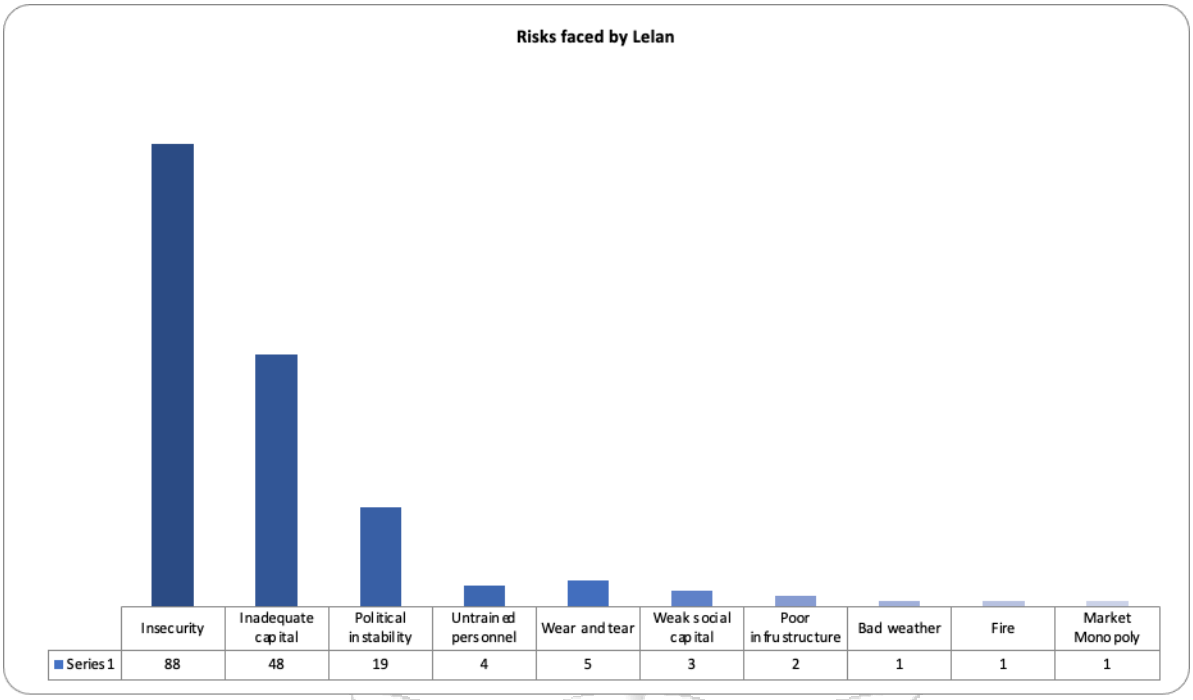


Figure 4. 3: Risks faced by Lelan Cooperative

It should be noted that insecurity, inadequate capital, and political instability are factors that negatively affect investment in most organizations including Lelan Cooperative.

According to Aisen and Veiga (2011), political instability has an adverse impact on economic growth and performance. Political instability has a negative impact on different macro-economic factors of investment (including partnerships and collaborations) and inflation which ultimately disrupts investment (Aisen & Vega, 2011). World Bank (2014) adds that political instability is associated with uncertainties that may limit investment.

According to Jelilov, et al. (2018), insecurity have a significant negative effect on investment as it discourages investors form investing while hindering organizations from doing business and sometimes results to diversion of resources to maintenance of peace and security. It is also worth noting that both insecurity and political instability often affects infrastructure negatively which also limits operations and investment in an organization (Jelilov, et al., 2018). Inadequate capital also has a negative effect on investment as it limits the capital available for investment and operations of an organization. Further, untrained personnel, dilapidated machines and poor infrastructure all results to inefficiencies in operations which ultimately affects investment.

4.5.4.2: Investment Opportunities for Lelan Cooperative

The findings of this study revealed improvement of security as the most fundamental opportunity for investment by Lelan Cooperative with majority of the respondents 69% indicating that security is an essential aspect. 58% of the respondents alluded to the need for talent management specifically training of security personnel while 11 % mentioned recruitment of security human resource as opportunity to improve the cooperative's investment capacity. Further the study findings showed that opening a Savings and Credit Cooperative (SACCO) was also an opportunity for the cooperative to invest as 16% of the respondents indicated. 5% of the respondents mentioned that increasing member shares was also an opportunity for the cooperative while 4% of stated improvement of infrastructure such as roads and the cooperative structures as opportunities. Two percent of the respondents revealed partnerships and expansion of extension services as opportunities that exist for the cooperative. This is further illustrated by Figure 4.4.

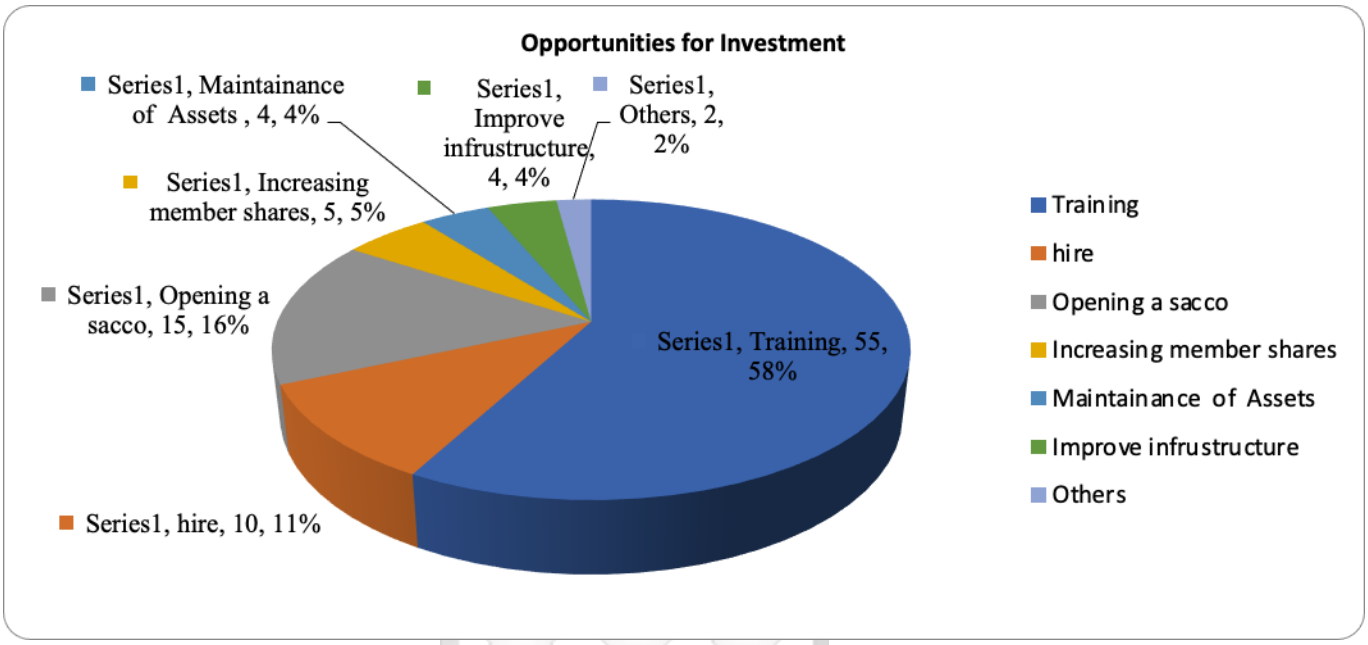


Figure 4. 4: Opportunities for Lelan Cooperative for investment

The findings of this study agree with the research results of Jelilov, et al. (2018) as well as Aisen and Vega (2011) both of which indicated that security is fundamental in enhancing investment both at the organization and country level. The results of this study also concur with the findings of Kibui, et al. (2014) who pointed out that talent management is a critical tool in enhancing organizational performance and competitiveness as the respondents of the study cited training and hiring as critical. It can be argued that opening a SACCO is a sound investment opportunity for Lelan Cooperative as indicated by 16% of the interviewees because according to Mwangi (2011) it enhances mobilization of savings and there is more guaranteed return in saving in a SACCO. Furthermore, a SACCO plays a fundamental role in providing loans to its membership which promote investment culture in its membership.

It is important to note that the findings also indicated that the cooperative have limited co-investments and partnerships as none of the respondents revealed a management structure where the cooperative have co-invested or co-partnered with external partners. This may be considered

as a missed opportunity because according to McDonald (2016) co-investments opportunities are more unique and lower cost investment alternatives as compared to private equity fund investments. Co investments are also important in enhancing deal making opportunities and cultivation of relationships with important stakeholders and actors (McDonald, 2016).

4.5.5 Ratio Analysis of investment Management

The study also performed a ratio analysis on investment management focussing on different indicators including non-current assets, working capital, capital employed, total debts and assets, total liabilities, and shareholder's equity. The financial data for the different indicators was generated from audited financial reports of Lelan Dairies and included the period between 2015-2019. Investment management of the cooperative was assessed through Return on Capital Employed (ROCE), debt to total assets ratio and debt to equity ratio. The results indicated that ROCE for Lelan Dairy cooperative was reducing over the years as it was 0.029 in 2019, 0.023 in 2018, 0,034 in 2017, 0.0258 in 2016 and 0.213 in 2015. The findings indicated that the cooperative registered debt to total assets ratio of 0.045 in 2019, 0.084 in 2018, 0.026 in 2017, 0.065 in 2016 and 0.142 in 2015. The results also indicated that the cooperative's Debt to equity ratio was 0.465 in 2019, 0.66 in 2018, 0.443 in 2017, 0.730 in 2016 and 0.890 in 2015. This is further illustrated in Table 4.6.

Table 4. 4: Investment Management Ratio Analysis

Indicators	**2019**	**2018**	**2017**	**2016**	**2015**
Non-current assets	28,615,092	30,870,388	27,894,852	29,971,026	30,821,723
Working capital	4,768,506	6,612,616	6,243,945	7,696,935	7,316,079

Capital employed	33,383,598	37,483,004	34,138,797	39,903,203	40,004,203
Earnings Before Interest and Tax	974,772	850,775	1,166,701	10,305,237	8,526,507
Return on capital Employed (ROCE)	*0.029*	*0.023*	*0.034*	*0.258*	*0.213*
Total debt	2,083,333	4,583,333	1,230,017	3,960,723	8,283,540
Total assets	45,853,388	54,795,480	47,501,647	60,539,616	58,331,081
Debt to asset ratio	*0.045*	*0.084*	*0.026*	*0.065*	*0.142*
Total liability	14,553,123	21,895,809	14,592,867	24,597,136	26,610,418
Shareholders' equity	31,300,266	32,899,671	32,908,781	33,707,238	29,899,262
Debt to equity ratio	*0.465*	*0.666*	*0.443*	*0.730*	*0.890*

4.5.6. Relationship between investment management on self -sufficiency

The study sought to find out the relationship of investment management on self-sufficiency of dairy cooperatives using Lelan Dairies Cooperative Society. This was done using correlation

analysis using Spearman's correlation and the results indicated that there is strong positive relationship between investment management and self-sufficiency as indicated by a correlation coefficient r_s of 0.600. However, the correlation coefficient is not significant as shown by a p-value of 0.284 which is greater than the significance level of 0.05. This is further depicted in Table 4.7.

Table 4. 5: Correlation matrix on investment management and self-sufficiency

Variables		**Self Sufficiency**	**Investment Management**
Self Sufficiency	Spearman's Correlation(r_s)	1.000	
	p. (2-tailed)		
	N	5.000	
Investment Management	Spearman's Correlation((r_s)	0.600**	1.000
	p (2-tailed)	0.284	0.284
	N	5.000	5.000

4.6: Findings of Objective 2: Expenditure management and self-sufficiency

4.6.1 Revenue and expenditure management systems

The study established that sales is the major source of revenue for Lelan Dairy Cooperative as indicated by the management and staff who were key informants in the study. 86 percent of the respondents cited sales as the revenue source for the cooperative while 14 percent indicated that loans were an important revenue source for the cooperative as Figure 4.5 reveals.

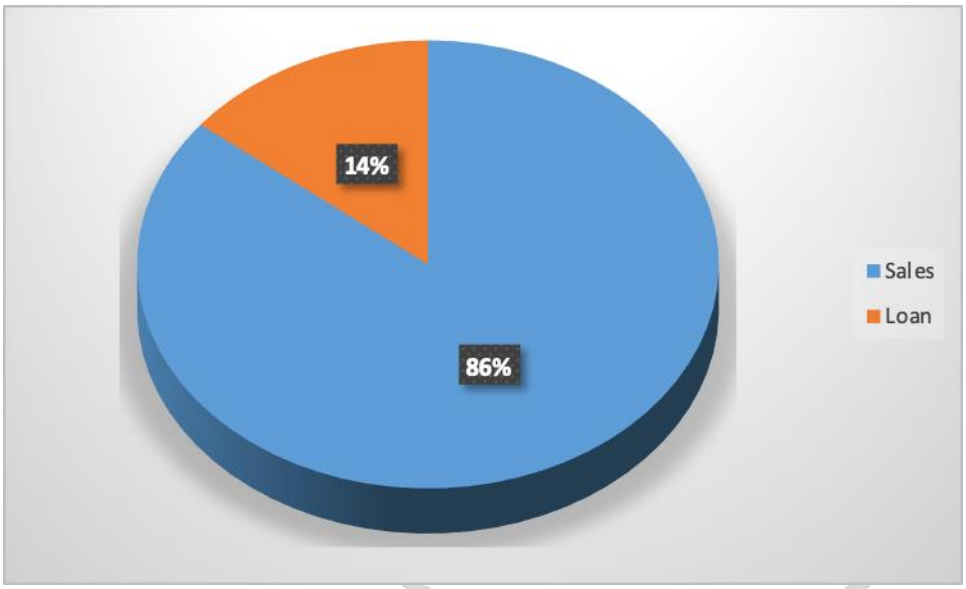


Figure 4. 5: Major sources of revenue for Lelan Dairy

It is important to note that none of the respondents cited asset returns as a source of revenue. This could be attributed to the fact that most of the assets invested in by the cooperative are assets aimed at enhancing the operations of the cooperative.

The findings also revealed that the major expenditure activity for the cooperative is asset acquisition with lower revenue amounts supporting staff salaries and operational costs.55% of the respondents cited asset acquisition as the cooperative's expenditure element while 27% and 18% of the respondents cited salaries and operational costs as expenditure items of Lelan Dairies. This is further indicated by Figure 4.6.

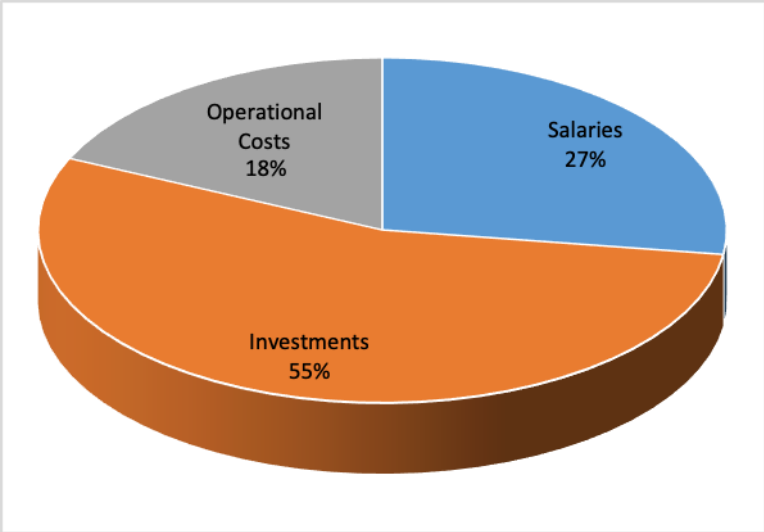


Figure 4. 6: Cooperative's major expenditure items

Further, the results indicated that the cooperative's capital expenditure is guided by financial manuals, human resource manuals and strategic plan. In assessing whether there is strict adherence of expenditures to budget allocations, it emerged that the cooperative management and staff uphold this practice as 83% of the respondents indicated that this was being done while 17% said that it was not being done as shown by Figure 4.7.

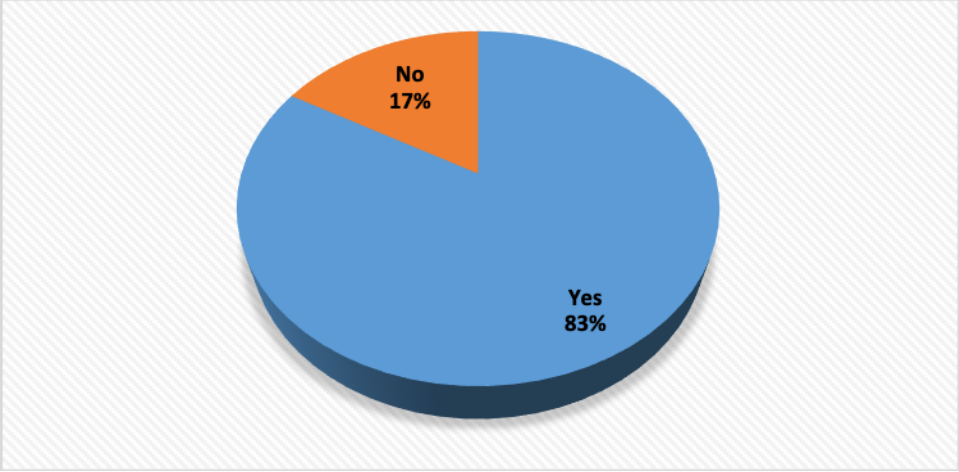


Figure 4. 7: Adherence of expenditures to budget

It also emerged from the findings that budgets are supervised and approved by the general manager of the cooperative. This is important in ensuring that expenditure is maintained within sustainable limits and that the expenses incurred are budgeted for. The study also sought to know whether budget planning and allocations are aligned to strategic priorities such as those set in the Cooperative's strategic plan with all (100%) key informants indicating that budget making process was aligned to key strategic priorities as guided by the strategic plan.

Lelan Cooperative also conducts audits of accounts annually as indicated by all (258) respondents who gave a response of yes when asked if the cooperative conducts audit of accounts. 3 of the respondents did not respond to this question and therefore it was missing data as Figure 4.8 shows.

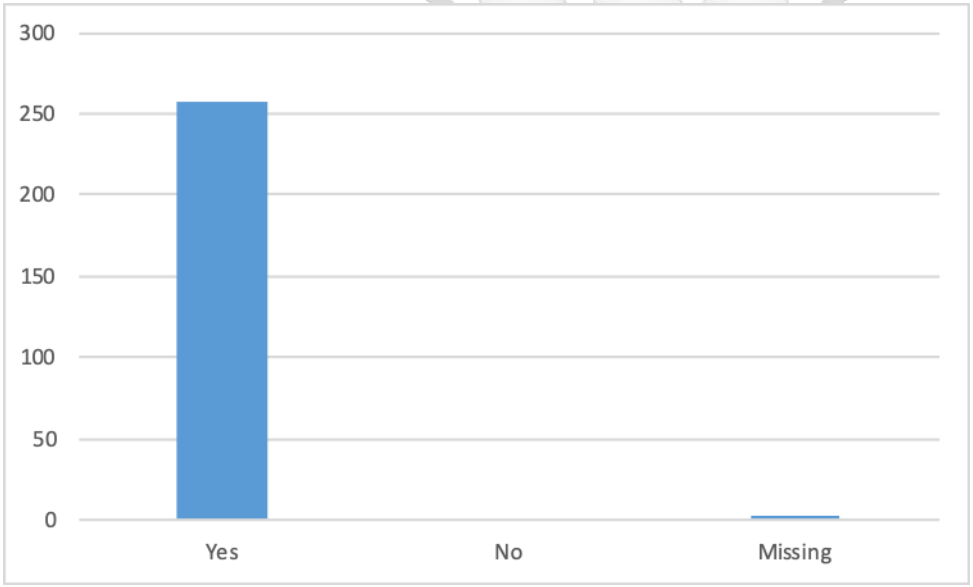


Figure 4. 8: Conduct of Audit

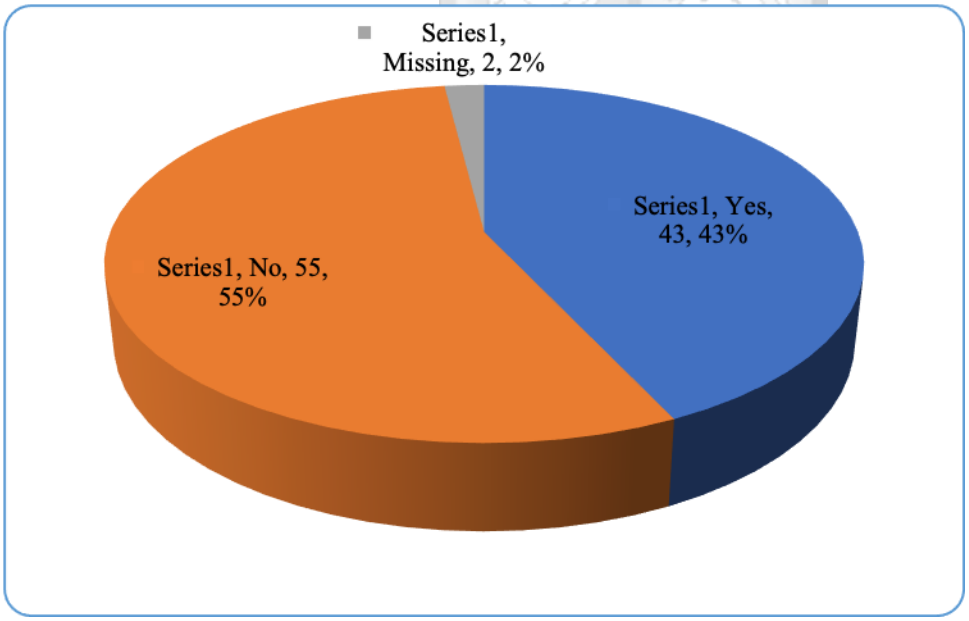
Conducting an audit is an important expenditure management practice which provides credibility of financial statements of an organization while enhancing the confidence of shareholders that the accounts of the organization are true (Bubilek, 2017). Further, audit of accounts is fundamental in detecting the flaws of the internal controls and systems in the expenditure

management structure for improvement (Bubilek, 2017). In this regard, Lelan Dairies has adopted some of the good expenditure management practices including auditing of accounts.

4.6.2 Payment systems and procedures.

The findings of the study established that the systems and procedures put in place by the cooperative for payments are not very effective and efficient. This was done by inquiring about the cooperative's payment schedule and its efficiency. The results indicated that the cooperative pay its members for milk delivered once a month with (98%) of the respondents backing this fact. However, 55% of the respondents indicated that the cooperative does not pay them in time while 43% were contented with the payment time. With majority of the respondents indicating dissatisfaction with the payment time, it can be argued that the payment systems and procedures are not effective and efficient. Two of the respondents did not respond, hence it was missing data. This is further illustrated in figure 4.9.

Figure 4. 9: Cooperative milk payment time



The respondents indicated that the cooperative should do the payments between the first and second week of every month but sometimes this is not feasible. The study also sought to find out what could be improved in ensuring the milk payment with the results showing that the payroll system was slow citing the data entry process. 58 % of the respondents indicated that there was need to speed up the payroll process and 40 % indicated that there was slow data entry process which ultimately slowed the payment to the farmers. 6 of the respondents did not give a response and thus this was missing data Table 4.8 illustrates.

Table 4. 6: Challenges affecting milk payment process

Challenge	Frequency(n)	Percentage
Data entry issues	104	40
Payroll system	152	58
Missing	6	2
Total	261	100

This is an indication of poor current asset and liabilities management since according to Wales (2013) current asset and liabilities management encompass control and supervision of cash flows of an organization including making payments. In addition, according to Potter & Diamond (1999), delays in payment of member's due may be attributed to budget decision making and execution process issues which affects the efficiency of payment systems.

4.6.3: Financial ratios of expenditure management of Lelan Dairy Cooperative

The study also sought to determine expenditure management through ratio analysis of the cooperative's audited financial data. The indicators that the study focussed on included total operating expenses, total revenues/sales, net credit purchases and average accounts payable from which total expense ratio and credit turnover were calculated for the period between 2015-2019. The findings established that the total expense ratio was 0.954 in 2015, 0.961 in 2016, 0.993 in

2019 and 2017 and 0.994 in 2018. The credit turnover ranged between 1.122 and 1.506 between 2015-2019 as shown in Table 4.9.

Table 4. 7: Ratio analysis for expenditure management

Indicator/s	**Year**				
	2019	**2018**	**2017**	**2016**	**2015**
Total operating expenses	23,885,894	21,109,038	21,205,317	20,522,020	16,952,406
Total revenue/Sales	135,324,356	142,571,033	163,574,936	264,758,684	183,371,709
Total expense ratio	*0.993*	*0.994*	*0.993*	*0.961*	*0.954*
Net credit purchases	13,851,296	17,033,976	18,584,044	27,310,997	21,052,069
Average accounts payable	12,345,165	12,817,850	14,861,465	18,132,095	17,182,480
Credit turnover	*1.122*	*1.329*	*1.250*	*1.506*	*1.225*

4.6.4 Link between expenditure management and self –sufficiency

Spearman's rank-order correlation was performed to determine the link between expenditure management and Self-Sufficiency of Lelan Dairies. The findings indicated that there is a moderate positive association between expenditure management and self-sufficiency which was

statistically insignificant as revealed by a correlation coefficient value (r_s) = 0.420, *p* (2-tailed) = 0.580. This implies that there is inconclusive evidence from this study about the association of the two variables. This Further illustrated by Table 4.10.

Table 4. 8: Correlation matrix between expenditure management and self –sufficiency.

Variables		**Self Sufficiency**	**Expenditure Management**
Self Sufficiency	Spearman's Correlation(r_s)	1.000	
	Sig. (2-tailed)		
	N	5.000	
Expenditure management	Spearman's Correlation(r_s)	0.510**	1.000
	Sig. (2-tailed)	0.380	0.380
	N	5.000	5.000

According to Rajaram, et al. (2014) it is important to enhance efficiency in investment spending/expenditure while ensuring transparency in the process. This is one of the lessons that Lelan Dairy Cooperative society would benefit from implementing in investment management.

4.7: Findings of Objective 3: Staff productivity and self-sufficiency

4.7.1 Number of staff per collection center

The study sought to know the number of employees in the different collection centres of Lelan Cooperative with the findings revealing that the average number of staff per collection centre is 4 because the mean was 3.89. The number of staff in the different collection centres involved in the study were as indicated in Figure 4.10.

Figure 4. 10: No. of staff in the collection centres

Most of the collection centres have 7 number of staff with the cooperative collection centre that has lowest number having 2 staff and Main collection office having 16 staff. According to the key informants involved in the study, the total number of staff working in the different collection centres was 78 and the current daily average volume of milk per collection centre is 1089 litres.

4.7.2 Daily Average milk volume collected by each staff

According to the key informants involved in the study, the average number of litres of milk collected currently by each staff per day is 153.6 litres. This was derived from the average volume of milk collected per collection centre and the average number of staff working in each collection centre.

4.7.3 Ratio analysis for productivity in Lelan Cooperative over 5 years

The findings indicated that the total number of employees have been relatively increasing over the years with the cooperative having a total of 78 employees in 2019, 81 in 2018, 69 in 2016 and 62 in 2015. The study showed that the total intakes per employee is relatively unstable but have been decreasing with the total intakes per employee recorded in 2019 being 173.08, which was slightly lower to 172.84 in 2018 and higher in 2017 to 239.13. In 2018, the total intake per employee was 295.25 compared to 215.25 in 2015. The total sales per employee for Lelan Dairies were as depicted in Table 4.11.

Table 4. 9: Staff productivity between 2015-2019

Indicator	2019	2018	2017	2016	2015
Total milk volumes (litres)	13,500	14,000	16,500	19,486	13,346
Total no of employees	78	81	69	66	62
Total sales/employee	1,734,928	1,760,136	2,370,651	4,011,495	2,957,608
Total intakes/employee	173.08	172.84	239.13	295.25	215.25

A decrease of the total intakes per employee is an indication of decreasing efficiency of employees over time. This implies that with lower volumes being collected by the cooperative meeting operational costs may pose a challenge. This finding agrees to Sharma and Sharma (2014) who found that decreased labour efficiency in an organization is associated with decreased profitability. High productivity tends to increase the competitive advantage through reduction in cost and improving in quality of output and thus employee productivity is a key determinant of organizational profitability and success (Sharma & Sharma, 2014).

4.7.4 Association of staff productivity on self - sufficiency

The study also sought to establish the association of staff productivity and self-sufficiency using Spearman's correlation test. The results showed that there is a strong positive relation between staff productivity and Self-sufficiency since the test revealed a correlation coefficient v of 0.700. Nevertheless, the coefficient correlation was not statistically significant as indicated by a *p*-value of 0.180. This is further illustrated in Table 4.12.

Table 4. 10: Correlation matrix between staff productivity and self –sufficiency.

Variables		Self Sufficiency	Staff Productivity
Self Sufficiency	Spearman's Correlation (r_s)	1.000	
	p (2-tailed)		
	N	5.000	
Staff Productivity	Spearman's Correlation (r_s)	0.700**	1.000
	p (2-tailed)	0.180	0.120
	N	5.000	5.000

4.7.5 Financial and Operational Self-Sufficiency

According to the results of this study, operational sufficiency has a strong effect on self-sufficiency in Dairy Cooperatives as shown by the different indicators of operational efficiency. Ongore and Kusa (2013) conducted a study in banks which indicated that efficiency is one of the important factors that determine profitability of an organization. On the other hand, profitability is closely related to financial self-sufficiency (Ongore & Kusa, 2013).

Working capital turnover ratio

This ratio measures how efficiently a business turns its working capital into increased sales numbers. A higher number is therefore favorable as it means the more sales you can bring in per shilling of working capital deployed, the better off you are. Lelan Dairies Working capital turnover ratio is reducing over the 5-year period from 31.09 in 2015 to 23.78 in 2019. Although still high and more than 1, a reducing rate is not good as it means working capital is not being efficiently utilised in turning around sales. There is need for proper cash flow management through renegotiating debts to favourable terms and disposing long term assets for ready cash.

The working capital turnover ratio measures how well a company is utilizing its working capital to support a given level of sales. A high turnover ratio indicates that management is being

extremely efficient in using a firm's short-term assets and liabilities to support sales. A higher ratio therefore indicates greater efficiency.

Operating expense ratio

This ratio shows how effectively a business can generate income. A look at Lelan Dairies OER shows an increase over the 5-year period in review with 0.09 in 2015 and 0.17 in 2019. This trend implies that the operating expenses are generally growing more than its sales. A sign that there is a need to further push for growth in sales at Lelan.

4.9 Correlation Analysis

The research also sought to establish the relationship between the dependent and independent variables. Spearman's correlation test was utilized to assess the effect of independent variables (investment management, expenditure management and staff productivity) on the dependent variable which was self-sufficiency. The results of the correlation tests are as presented in table 4.13.

Table 4. 11: Correlation Analysis Matrix

Variables		Self Sufficiency	Investment Management	Expenditure management	Staff Productivity
Self Sufficiency	Spearman's Correlation(r_s)	1			
	p (2-tailed)				
	N	5			
Investment	Spearman's	0.600	1		

Management	Correlation($r_{s)}$				
	p (2-tailed)	0.284	0.284		
	N	5	5		
Expenditure management	Spearman's Correlation($r_{s)}$	0.510	0.380	1	
	p (2-tailed)	0.380	0.598		
	N	5	5	5	
Staff Productivity	Spearman's Correlation($r_{s)}$	0.700	0.378	0.698	1
	p (2-tailed)	0.180	0.531	0.190	
	N	5	5	5	5

The first objective aimed at determining the relationship between investment management and self -sufficiency of dairy cooperatives in West Pokot, Kenya. The results of Spearman's correlation showed that there exists a strong positive result between investment management and self –sufficiency as indicated by a correlation coefficient value of 0.600. The second objective was to investigate the link between expenditure management and self-sufficiency of Dairy cooperatives in West Pokot, Kenya. The research findings showed that there was a moderately positive effect between expenditure management and self-sufficiency as revealed by correlation coefficient value of 0.510. The third objective sought to examine the association of staff productivity and self-sufficiency of Lelan Dairy Cooperative in West Pokot, Kenya. A Spearman's correlation on the two variables showed that there is a strong positive influence between staff productivity and self-sufficiency as indicated by a correlation coefficient value of 0.700.

4.10 Summary of Results

A summary of financial data and ratio analysis for Lelan Dairies for the last 5 years as generated from audited financial reports of the cooperative is presented in Table 4.14

Table 4. 12: Summary of results

Variables		**Indicator**	**Measurement**	**2019**	**2018**	**2017**	**2016**	**2015**
Independent	Investment Management	Return on Capital Employed (ROCE)	EBIT/Capital employed	0.03	0.02	0.03	0.26	0.21
		Debt to asset ratio	Total debt/Total assets	0.05	0.08	0.03	0.07	0.14
		Debt to equity ratio	Total liability/ Shareholders equity	0.46	0.67	0.44	0.73	0.89
	Expenditure management	Total expense ratio	Total operating expenses (COGS+OE)/Total Revenue	0.993	0.994	0.993	0.961	0.954
		Credit turnover	Net credit purchases/average accounts	1.12	1.33	1.25	1.51	1.23

			payable					
	Staff Productivity	Total output to total input per staff	Total milk volumes/ Total no of employees	173.08	172.84	239.13	295.25	215.25
			Total sales/total no of employees	1,734,927	1,760,136	2,370,651	4,011,495	2,957,608
Dependent	Financial self sufficiency	Working capital turnover ratio	Sales/Average working capital	23.78	22.18	23.47	35.27	31.09
	Operational self sufficiency	Operating expense ratio	Operating expenses /Revenues	0.177	0.148	0.130	0.078	0.092

CHAPTER FIVE: DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMEDATIONS

5.1 Introduction

This chapter provides a discussion and summary of the research findings of the study based on the objectives and discusses these findings based on both analysis and research findings of previous studies. Conclusions drawn from the research findings as well as recommendations for both the cooperative and for further study is also be presented in this chapter. The limitations of the study are also highlighted.

5.2 Discussion of Findings

The first objective aimed at determining the relationship between investment management and self -sufficiency of dairy cooperatives. A test of this relationship using Spearman's correlation indicated that there is a strong positive result between investment management and self – sufficiency as indicated by a coefficient value (0.600). This finding agrees with a study by Cheptoo (2016) who indicated that investment management has a positive effect on profitability and financial sufficiency. However, the findings of this study are different in that the relationship was not significant while the Cheptoo (2016), found that the effect was significant.

The results of this study are also in agreement with those of Gathungu (2015) who revealed that mobilizing assets and appropriate management of securities (including bonds and shares) enhances the sustainability (which is synonymous to self-sufficiency in the definition adopted by this study) of an organization. The results of the study also revealed increasing member shares as an investment opportunity a finding that is in congruence with the view of Aisen and Veiga (2011) who pointed out that increased investment shares have a positive relationship to growth and self-sufficiency of an organization.

An analysis on Return on Capital Employed, ROCE (which is a measure of investment management) for Lelan Dairy cooperative indicates reducing ROCE over the years from 0.21 in

2015 to 0.03 in 2019. This indicates reduction in efficiency regarding capital employed over the reviewed period. It should be noted that capital employed refers to the value of all the assets used by a company/institution to generate earnings and thus return on capital employed is a financial ratio that measures a company's profitability and efficiency in terms of all of its capital (Shahid & Dar, 2017). ROCE is an indicator of profitability and therefore a higher ROCE indicates stronger efficiency and profitability (Shahid & Dar, 2017).

An investigation on the effect of expenditure management on self-sufficiency was the second research objective. The study revealed that there exists a moderate positive relationship which is insignificant between expenditure management and self-sufficiency as revealed by a correlation coefficient (0.510). This finding agrees with the results of a study by Bubilek (2017) which showed that expenditure management is a key aspect of financial and operational performance. According to IMF (2016) appropriate cash and debt management practices which are critical activities of expenditure management have a positive link with self-sufficiency. The sufficiency of an organization is strongly dependent on its ability to manage expenditure to ensure that the expenditure remains below the revenues (Beblavy, et al., 2012).

Regarding objective three, the findings of this study indicated the existence of a strong positive relation between staff productivity and self-sufficiency. A correlation test between the two variables showed a correlation coefficient (v) of 0.700 which was not statistically significant as indicated by a *p*-value of 0.180**.** According to Kim and Ployhart (2014) the more effective the staff is in its work, the more profits it earns; efficiency in staff is associated with increased profitability. This finding agrees to the findings of this study that staff productivity is strongly associated with self-sufficiency as one of the indicators of self-sufficiency is financial sufficiency closely related to profitability. The results are also in congruence with those of Shree Raja Gopal and Murali (2016) which recognized labor productivity as a significant factor, which can holistically determine organization's efficiency and effectiveness. In essence, this study showed that staff are fundamental in sustaining operational and financial sufficiency of an

organization which agrees with the findings of Bellou and Chatzinikou (2015) who revealed that employees are increasingly becoming drivers of organizational success. According to Taylor, et al. (2016), labor productivity can be influenced by three broader factors including human capital, technical expertise, and economies of scale. Thus, staff productivity has different elements which may affect efficiency, and this could explain the fact that this study did not find significance of the relationship between staff productivity and efficiency.

5.3 Summary of the Findings

5.3.1 Summary of objective 1: Relationship between investment management on self-sufficiency

According to the study, there is a strong positive relationship between investment management and self-sufficiency in Lelan Dairy Cooperative society with correlation coefficient value being 0.60. The relationship of the different indicators of investment management and sufficiency are according to the study findings are summarized below.

5.3.1.1: Return on Capital Employed (ROCE)

An analysis on Return on Capital Employed (ROCE) for Lelan Dairy cooperative indicates reducing ROCE over the years from 0.21 in 2015 to 0.03 in 2019. This indicates reduction in efficiency regarding capital employed over the reviewed period.

5.3.1.2: Debt to asset ratio

The results showed that Lelan Dairies registered a higher debt to asset ratio in 2015 and 2018 of 0.14 and 0.08 respectively compared to the rest of the years. A percentage amount of debt that Lelan Dairies used in financing investment of assets vis-à-vis shareholder's equity. The results showed that Lelan Dairies registered a higher debt to asset ratio in 2015 and 2018 of 0.14 and 0.08 respectively compared to the rest of the years. A percentage amount of debt that Lelan Dairies used in financing investment of assets vis-à-vis shareholder's equity. A review of the cooperative's books of account showed that loans were taken in these two years. Generally, the higher the debt to total assets ratio, the greater the financial leverage and the greater the risk.

5.3.1.3: Debt to Equity ratio

Regarding Debt-to-Equity ratio (DER), the findings established that the debt-to-equity ratio of Lelan Dairies over time is stable and close to one. This implies that shareholders have more ownership in the cooperative compared to creditors. This is great for a farmer organisation that would like to create more value and ownership to its members because according to Sawir (2014), the greater the ratio, the better the institution's ability to pay interest and hence the opportunity to get a loan. The debt-to-equity ratio shows the percentage of company financing that comes from creditors and investors. A higher debt to equity ratio indicates that more creditor financing (bank loans) is used than investor financing /shareholders (Nasution, et al., 2018). DER describes the capacity of an institution's own capital to meet its obligations (Nasution, et al., 2018). Hantono, (2015) agrees that debt to equity ratio describes the capacity of an institution's own capital to meet its obligations According to Nasution, et al. (2018), financial performance can be demonstrated through profitability of an institution. It should be noted that debt to equity ratio is a fundamental determinant of the capital structure of an institution (Nasution, et al., 2018). Nasution et al. 2018 showed that debt to equity ratio significantly affects Return on Equity which is one of the ratios used to determine profitability by determining the ability of an institution or company to manage equity or capital owned by the institution to gain profit.

5.2.2 Summary of objective 2: To investigate the link between expenditure management and self-sufficiency

The findings of the study showed that there is a moderate positive relationship between expenditure management and self-sufficiency with a correlation coefficient of 0.510 and that this relationship is insignificant. Regarding the status of expenditure management in Lelan Dairy cooperative, the study established that the cooperative has weak/poor expenditure management as demonstrated by the total expense ratios. According to the study results, the total expense ratio for Lelan Dairy cooperative is a stable but high ratio of close to 1 over the five-year period. This is not a good indication of expenditure management as it means that operating expenses are a

higher percentage of net sales. This can be explained by the nature that the cooperative buys milk and markets it raw hence there is minimal return/ incomes.

In addition, the study results indicated that there is either a slow payment system or cash flow problems as indicated by credit turnover**.** Credit turnover is a measure of the average number of times that the creditors are paid during a period (Nasution, et al., 2018). The results of ratio analysis showed that the credit turnover ratio values of Lelan Dairies over the 5-year period are relatively stable and higher than 1 With lower ratios as these might indicate slow payment to suppliers for purchases on credit. This may be due to favorable credit terms, or it may signal cash flow problems and hence, a worsening financial condition. A close observation of Lelan's financial data illustrate an acquisition of an overdraft in 2019 and an increase in creditors in 2016. This is a sign that the cooperative grapples with cash flow problems.

5.2.3 Summary of findings of Objective 3: The influence of staff productivity on self-sufficiency of Dairy Cooperatives

The findings indicated there is a strong positive relation between staff productivity and Self-sufficiency since the test revealed a correlation coefficient value of 0.700. Ratio analysis of the total output to total input per staff as an indicator of staff productivity indicated decreasing efficiency of staff in Lelan Dairy Cooperative over the five-year period. This ratio indicates the efficiency created per employee hired. A look at the total milk intakes in comparison with number of staff shows a decrease over the years. This means that employees are getting less efficient. With lower volumes, meeting operational costs can be a challenge. This can be explained by reduced milk volumes over the 5-year period. A look at the total sales in comparison with total no of employees also shows a decrease. Again, this shows the impact of reduced milk volumes on the efficiency of staff**.**

5.4 Conclusions

According to the findings of the study, it can be concluded that investment management, expenditure management and staff productivity are fundamental aspects of self-sufficiency of an organization since they were all positively associated with self-sufficiency of Lelan Dairy cooperative. Investment management and staff productivity have a strong relationship with self – sufficiency implying that enhancement of these practices would greatly enhance self-sufficiency of Dairy cooperatives and other organizations.

Based on the findings of this study, it is evident that hybrid models and structures of investment management are strongly associated with more benefits of operational efficiency and hence self-sufficiency in Dairy cooperatives

Expenditure management is moderately associated with self-sufficiency. There is a weak expenditure management system in Lelan Dairies. Lelan Dairies total expense ratio which is an indicator of expenditure management shows a stable but high ratio of close to 1 over the five-year period. Though this could be attributed to marketing on non-value-added milk, which attracts little profits, there is need to address it.

Overall, investment management, expenditure management and staff productivity being operational efficiency indicators in the study, it suffices to conclude that operational efficiency has a positive effect on self-sufficiency of Dairy Cooperatives in Kenya.

5.5 Contribution to Knowledge

The findings of this study add to the existing body of knowledge on fundamental aspects of self-sufficiency in Dairy Cooperatives in Kenya. Specifically, the study fills a knowledge gap on the effect of operational efficiency on self-sufficiency. The research has generated knowledge on the effects of investment management, expenditure management and staff productivity (as fundamental indicators of operational efficiency) on self-sufficiency of dairy cooperatives with its recommendations being applicable to other farmer cooperatives in Kenya.

5.6 Recommendations

5.5.1 Recommendations for Policy

The findings of this study have shown that investment management, expenditure management and staff productivity are important aspects and practices of self-sufficiency and hence competitiveness of an organization. There is need to develop and implement policies that promote investment management, expenditure management and staff productivity both at the organizational/institutional level and at the country level. Besides, the management of farmer cooperatives ought to formulate strategies, guidelines and systems that ensure prudent revenue generation and expenditure management. The guidelines should guarantee alignment/adherence of the organization's expenditure to budget allocations. It is also critical for human resource management of the cooperatives to formulate and implement policies such as compensation that enhance and sustain staff productivity in an organization. Such policies would be critical in providing an enabling environment for stimulating investment, expenditure and human resource management best practices in organizations and the country at large.

5.5.2 Recommendations for Practice/Managerial Recommendations

Spearman's correlation tests have shown that investment management, expenditure management and staff productivity positively influence's self-sufficiency in Dairy Cooperatives. It is thus recommended that leadership and managers should develop, implement, and promote adoption of investment management, expenditure management and staff productivity best practices in every organization for enhanced self-sufficiency. The managers of dairy and other farmer cooperatives should develop and implement asset and financial investment management structures that maximize returns to the cooperative while reducing risks as much as possible. It is significant for accounting managers of every organization to ensure there is accountability measures that ensure fiscal discipline and that expenditures do not exceed incomes. The management of farmer cooperatives and other institutions should ensure that they have adopted cash management systems and procedures that promote efficient and effective payments. Of equal importance is for management to utilize staff recruitment, retention and talent management

practices that enhance and sustain staff productivity which is a fundamental determinant of self-sufficiency in an organization.

5.6 Suggestions for Further research

The study findings on Spearman's correlation revealed that the coefficients values of all variables were greater (0.180, 0.380 and 0.284) than the significance value (0.05). This implies that according to the study results, there is inconclusive evidence about the significance of the association between the various study variables. Though this could partly be attributed to the fact that the study relied on audited accounts of Lelan Dairy cooperative of the last 5 years only for financial data. It is suggested that there is need for more research on the significance of the relationship between investment management, expenditure management and staff productivity on self-sufficiency of dairy cooperatives and other organizations to be conducted to establish evidence on the significance of their relationship.

5.7 Limitations for the research

There were a few limitations experienced during the research process. The accuracy of the study findings was dependent on the honesty of the study participants in which case, some respondents may not be honest. The researcher gave an assurance to the respondents that anonymity would be maintained, and the results would only be utilized for academic purposes. In this regard, it is hoped that the respondents provided honest and accurate responses. Besides, the research collected data from one dairy cooperative as the case study and representative of all other dairy cooperatives in Kenya due to financial and time constraints. With adherence to strict research quality measures such as validity and reliability tests of the data collected it is hoped that the data collected was reliable and valid to represent other dairy cooperatives and institutions

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APPENDICES

APPENDIX 1: Questionnaire

General objective of the study: To determine The Effect of Operational Efficiency on Self-Sufficiency of Dairy Cooperatives: A Case Study of Lelan Dairy in West Pokot County, Kenya

Fill out the responses in the provided spaces

Bio -Information

No.	Question	Response
1.	Code of respondent	
2.	Gender	1= Male 2= Female
3.	Position in the cooperative	
4.	Age	1=18-35years 2= 36-60 years 3 = >60years
5.	Level of Education	1= Primary [ ] 2= Secondary [ ] 3= Tertiary [ ] 4= No Formal Education [ ]
6.	Background training	

i) <u>Staff productivity</u>

7. How many staff are employed by the cooperative both at the collection centers and the head office?

Branch	*Number of Staff*	
Head office		
Collection Centres (CC)	CC1 CC2 CC3 CC4 CC5 CC6	CC7 CC8 CC9 CC10 CC11 CC12

8. What is the average volume of milk (in liters) collected per day in each of the collection centres?

9. What is the average number of liters of milk collected by each staff per day and week?
   Per day
   Per week

10. How many hours does the staff (who collects milk) work per day and week?

Duration	*Number of hours worked*
1-Per day	
2-Per week	

11. How many staff are attached as operational technicians of the cooling machine at the cooperative's head office?

1=1-3

2=4-6

3=7-9

4= 10 and above

12. What is the average volume (liters) of milk cooled per day?

13. What is the total cooling capacity of the machines (in litres)?

14. What is the revenue of the cooperative per day, from the milk produced per day, month and year?

Year	2015	2016	2017	2018	2019
Revenue (Ksh)					
Per day					
Per month					
Per year					

ii) <u>Investment management</u>

15. What investments have the cooperative made in the last five years (2015-2019)

Investment	Year

16. What are the investment management delegation structures of the cooperative?

1= Direct delegation and

2= Mutual fund investment structures

3=Others (Specify)

17. What assets does the cooperative own? List all of them

18. What is the ownership models of these assets?

1= Members only

2=Members and managers

3=members and external partners

4= Others(specify)

19. How are the assets of the cooperative managed?

1=Cooperative managers

2=Both cooperative managers and leaders

3=External asset manager

4= Others(specify)

20. What is the value of the assets owned by the cooperative in the last 5 years?

Year	2015	2016	2017	2018	2019
Asset Value (Ksh)					

21. What are the financial management structures and systems of the cooperative?

22. What are the risks (both financial and other) of the cooperative?

23. What are the existing opportunities for the cooperative to address the risks?

24. What are the annual earnings/returns of the assets of the cooperative (last 5 years)

Year	2015	2016	2017	2018	2019
Asset Returns/Earnings (Ksh)					

25. What is the total annual revenue of the cooperative for the last 5 years?

Year	2015	2016	2017	2018	2019
Total Annual Revenue (Ksh)					

26. What is the source of the revenue/ Revenue streams of the cooperative?

1=Sales

2=Asset returns

3=Others (Specify)

iii) <u>Expenditure management</u>

27. What are the sources of capital for the cooperative?

1= Sales

2= Loans

3= Savings

4= Others(specify)

28. What are the activities on which the cooperative spends its capital on?

1= Salaries and compensation

2= Investments e.g., asset acquisition

3= Operational costs

4=Machine/Equipments maintenance

5= Others(specify)

29. Does cooperative have systems and procedures that guide capital expenditure?

1. 1=Yes
2. 2=No

30. If yes, which ones?

I)

ii)

iii)

31. Does the cooperative have budget allocations for its expenditures?

1=Yes

2=No

32. If yes, how often are the budgets developed? (Tick all that apply)

1= Annual Budgets

2= Quarterly Budgets

3= Monthly budgets

4= Activity Budgets

5= Ad-hoc budgets

6= Others (Specify)

33. Who is the supervisor and approver of the budgets?

Are the expenditures of the cooperative strictly aligned to the budget allocations?

1=Yes

2=No

34. If No, what are the exemptions?

35. Are there budget limits for the exemptions?

1= Yes

2= No

36. If yes, what guides these exemptions?

i)

ii)

iii)

iv)

37. Do the budget allocations adhere to the set strategic priorities (agreed in the strategic plan) of the cooperative?

1=Yes

2=No

38. What is the total capital expenditure for the cooperative per year (last 5 years)

Year	2015	2016	2017	2018	2019
Total Annual CAPEX (Ksh)					

39. What is the total return on capital for the cooperative per year (last 5 years)?

Year	2015	2016	2017	2018	2019
Total Return on Capital (Ksh)					

40. What is the average gross loans of the cooperative (last 5 years)?

Year	2015	2016	2017	2018	2019
Average gross loans (Ksh)					

41. What are the total debts of the cooperative in 2019?

42. What mechanisms have the cooperative put in place to settle the debts?

i)

ii)

iii)

iv)

43. How does the cooperative conduct its payments? (To both members and other stakeholders)

44. Do the cooperative hold annual general meetings?

1= Bi-annual

2= Annually

3=Others(specify)

45. Does the cooperative conduct audits of their accounts/finances?

1=Yes

2=No

46. If yes, how often?

1= Bi-annually

2= Annually

APPENDIX 2: Ethical Approval

Strathmore UNIVERSITY

30th January 2020

Mr Maket, Hillary
khillarito@gmail.com

Dear Mr Maket,

RE: The Effect of Operational Efficiency On Self-Sufficiency of Dairy Cooperatives: A Case Study of Lelan Dairy in West Pokot County, Kenya

This is to inform you that SU-IERC has reviewed and **approved** your above research proposal. Your application approval number is **SU-IERC0605/19.** The approval period is **30th January, 2020 to 29th January, 2021.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

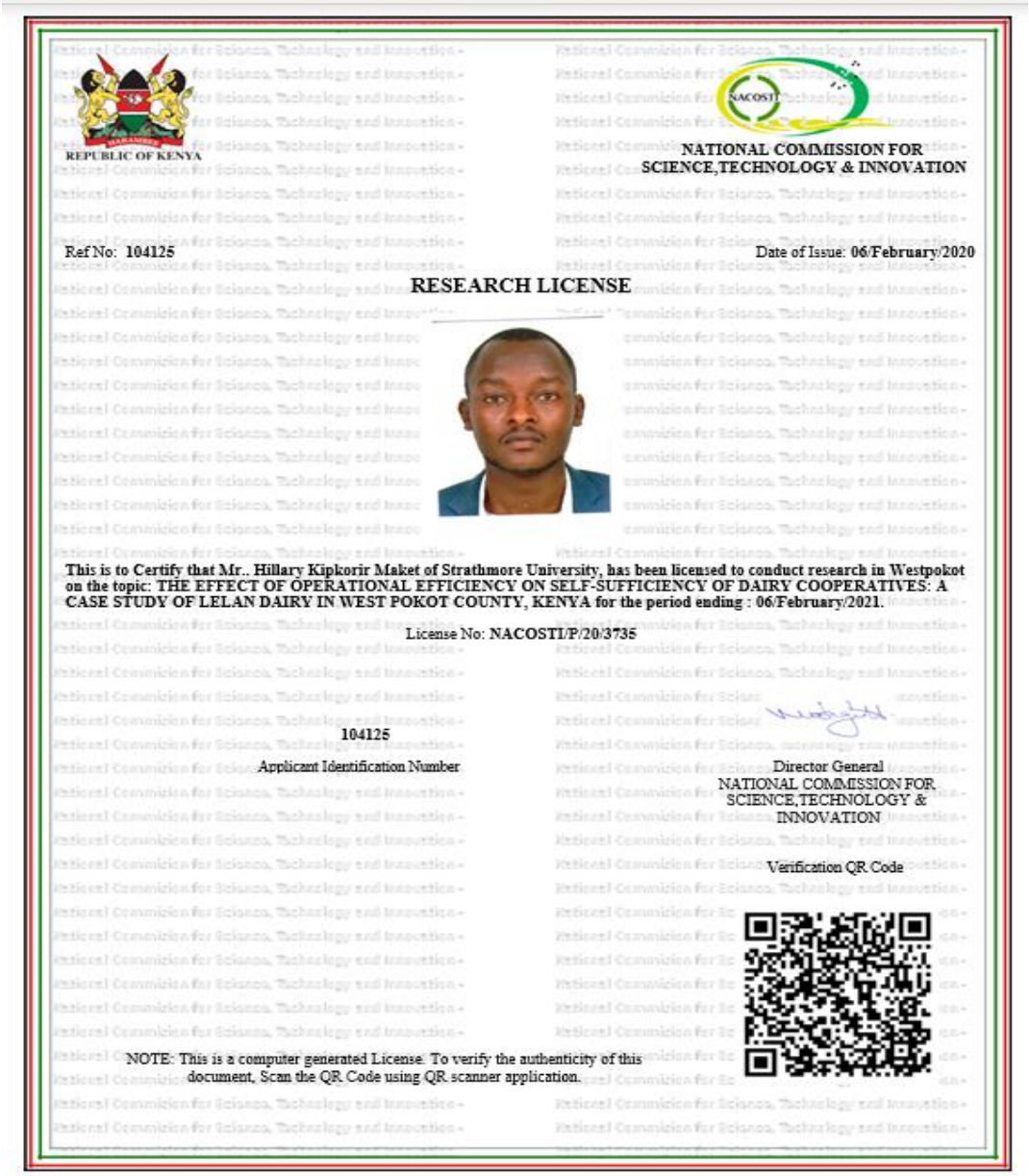
Yours sincerely,

for Dr Virginia Gichuru,
Secretary; SU-IERC

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
30 JAN 2020
TEL: +254 (0)703 034 000
P. O. Box 59857 - 00200
NAIROBI - KENYA

Cc: Prof Fred Were,
Chairperson; SU-IERC

APPENDIX 3: NACOSTI Research Authorization



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 104125

Date of Issue: 06/February/2020

RESEARCH LICENSE

This is to Certify that Mr.. Hillary Kipkorir Maket of Strathmore University, has been licensed to conduct research in Westpokot on the topic: THE EFFECT OF OPERATIONAL EFFICIENCY ON SELF-SUFFICIENCY OF DAIRY COOPERATIVES: A CASE STUDY OF LELAN DAIRY IN WEST POKOT COUNTY, KENYA for the period ending : 06/February/2021.

License No: NACOSTI/P/20/3735

104125

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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