

**DAIRY COOPERATIVE SERVICES AND LIVELIHOODS OF LOCAL COMMUNITY
FARMERS IN DAIRY FARMING IN KIAMBU COUNTY, KENYA**

BY

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MASTER OF SCIENCE IN DEVELOPMENT FINANCE

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OCTOBER, 2025

DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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ABSTRACT

Dairy cooperatives are significant in the production, distribution, and marketing of milk and dairy products. Through such cooperative initiatives, jobs have been created, and poverty has been alleviated. Therefore, such organizations have equally made it possible for the economy to be stable and have provided a framework for domestically motivated, community-based investment that has seen improved livelihood among the populace. Given the critical role that cooperatives play in overall societal development, this study evaluated dairy cooperative services and livelihoods of local community farmers in dairy farming in Kiambu County, Kenya. The specific objectives included to evaluate the effect of market access on the livelihoods of local community farmers in Kiambu County, Kenya, to assess the effect of credit access on the livelihood of local community farmers in Kiambu County, Kenya, and to analyze the effect of training on livelihoods of local community farmers in Kiambu County, Kenya. Regarding methodology, the study used descriptive research design and the research was conducted among all dairy farmers registered with cooperatives in Kiambu County. Dairy cooperatives were 20 with a local community farmer population of 73,319. The study utilized scientific formula proposed by Yamane (1967) to get a sample size of 398 respondents. The study used simple random sampling during questionnaire distribution. Data was processed using Statistical Packages for Social Sciences (SPSS) version 31 whilst both inferential and descriptive statistics were used during data analysis. The study found that market and credit access as well as training predicted about 8.4% in the variation in farmers' livelihood. The model (ANOVA) was also significant at $0.001 < 0.01$. Coefficients revealed that market access had a negative significant relationship with farmers' livelihoods ($\beta = -0.131$; $p\text{-value} = 0.001$). However, credit access had positive insignificant relationships with livelihoods ($\beta = 0.067$; $p\text{-value} = 0.100$) while training also possessed positive insignificant relations with livelihoods ($\beta = 0.143$; $p\text{-value} = 0.085$). The study concluded that poor market access was occasioned by distantly located markets, stiff competition, transportation costs, and poor road networks in remote areas. The study concluded that farmers were able to access loans with adequate grace period and at friendly interest rates while trainings were regularly offered in the form of basic education in fora such as workshops and seminars. On market access, research recommends that local and national government should support dairy farmers by ensuring rural roads are constructed and maintained to enable the efficient and economical delivery of dairy products. Regarding credit access, research recommends that cooperatives should create loan solutions such as more flexible repayment terms that suit farmers' needs and preferences to boost credit uptake. Concerning training, research recommends that cooperatives ought to add financial literacy to their training modules by emphasizing subjects like debt management, savings, and prompt budgeting to enhance funds' management and ultimately, improved farmers' livelihoods.

Key words: Dairy cooperative services, Livelihoods, Market access, Credit access, Training, Dairy farmers.

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ACRONYMS AND ABBREVIATIONS

ANOVA:	Analysis of Variance
CDP:	Co-operative Development Policy
DVCs:	Dairy Value Chains
ICA:	International Cooperative Alliance
ICA-EU:	International Co-operative Alliance, European Union.
LMICs:	Low-Middle Income Countries
MST:	Movimento dos Trabalhadores Rurais Sem Terra
SCEs:	Social Cooperative Enterprises
SLA:	Sustainable Livelihoods Approach
SPCs:	Seed Producer Cooperatives
WSF:	World Social Forum

TERMS AND DEFINITIONS

- Cooperatives:** It is defined as a self-governing group of individuals who have come together willingly to address their shared socio-economic needs and goals through a cooperatively owned and democratic business (Abdullahi, Attah, & Onje, 2021).
- Credit:** Credit is the trust that permits a person (financier) to give funds to another, with the understanding that receiver will either repay the first party at a later date with interest (Kumkit et al., 2022).
- Livelihood:** It is defined as a person's lifetime of necessary actions carried out throughout daily living (Solomon, 2022). Obtaining water, food, fuel, medication, shelter, and clothes are a few examples of such activities.
- Market access:** This is the ability of a business to sell its products and services beyond its location (Bekele, 2021).
- Training:** Training is the process of imparting knowledge, skills, and expertise related to certain practical competencies to an individual to improve their performance (Seble et al., 2020).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The International Cooperative Alliance (ICA, 2020) describes a cooperative as an independent group of people joined deliberately to address their shared economic, social, and cultural needs and ambitions via a mutually beneficial and democratically regulated firm. A cooperative should uphold the principles of self-help, transparency, integrity, accountability, and social duty as well as equality, democracy, fairness, solidarity, reciprocal care, effectiveness, and efficiency (ICA, 2020). A cooperative can also be defined as an independent group of people who have come together voluntarily to work for the same economic, social, and cultural goals through a jointly owned and democratically run business (Mbugua & Kinyua, 2020). Meanwhile, livelihood is the ability to afford essentials in order to meet individual basic requirements and satisfy the demands of their households (Fitzpatrick & Akgungor, 2023). The cooperatives have thus been formed with the aim of improving livelihoods.

Cooperatives have the ability to increase market involvement by farmers and boost production in the peasant sector (Birthal, Joshi & Gulati, 2015). Dairy cooperatives provide producers with a number of benefits over solo farming and marketing. According to Lapar, TrongBinh, Tuan Son, Tiongco, Jabbar & Staal (2016), it strengthens or streamlines accessibility to market knowledge, lowers marketing costs, and boosts producers' accessibility to technology, expansion, and comparable services, all of which enhance the productivity of milk and dairy product manufacturing and distribution.

Thus, by tackling industry barriers, development efforts ought to concentrate on enhancing smallholder farmers' output, productivity, and marketing endeavours. Communal organisations

like cooperatives can do this (Toiba et al., 2024). The governance structure and capacity of dairy cooperatives enable its members to accomplish the Sustainable Development Goals (SDGs). Dairy cooperatives enable dairy producers to become vertically integrated to counteract oligopolistic tendencies in distributing and retailing, despite the strong market reliance and socioeconomic values associated with dairy production. This is implemented by setting up dairy supply networks by improving strategic logistics across manufacturing, processing, and distribution in developing nations (Can & Engindeniz, 2025).

Additionally, it is accomplished by lowering financial hazards and economic instability that members encounter due to rising milk and feed cost swings and granting dairy farmers milk value at levels that significantly surpass prices whenever markets are unpredictable or stagnant (Zhong et al., 2022). Any of these are accomplished via democratic governance system dominated by dairy farmers and run by workers with necessary skill, and this help maximise returns and minimise production costs, that lowers transaction fees. Cooperative businesses are most adapted to address economic aspects of SDGs, such as lowering inequality and poverty by finding economic possibilities for members, enabling the underprivileged to stand up for rights, and giving the impoverished access to nutrition, health, and food security. This is accomplished by facilitating member utilisation of assets they use to make their livelihoods and enabling cooperatives to transform personal hazards into communal ones (Candemir, Duvaléix, & Latruffe, 2021). Dairy cooperatives are sustainable, participative organisations that are founded on values and principles (Liang et al., 2021). Participatory principles, social integration, gender parity, secured employment, improved working conditions, competitive pay, and extra revenue through sharing profits and payouts of dividends are all prioritised. In order to assist accomplish the SDGs, alleviating poverty, food, dietary, and health safety, gender equality, more decision-making, and

empowering neighbourhood facilities and services are also prioritised. Among the objectives of Dairy Cooperatives was to reduce or alleviate poverty by mobilising self-help programs to provide avenues and social security by empowering vulnerable dairy farmers (Fadillah et al., 2023). This was accomplished via collaborative, fair, and democratic control and administration of resources, as well as via improved adaptability by lowering monetary and financial risk grounded in the concepts of reciprocation, collaboration, and mutual dependence.

A household can meet its needs and generate some monetary revenue through any combination of economic activity that constitutes a livelihood. These tend to become a "way of life" when practiced frequently (Virendra Kumar et al., 2015). Cooperatives are crucial to improving rural livelihoods because most of the population relies heavily on agriculture, especially in rural areas (Mersha & Ayenew, 2018). Almost every industry uses cooperatives in agriculture, food, finance, health care, marketing, insurance, and credit. In fact, through such services, farmers' livelihoods can be improved.

Regardless of social level, cooperative movements unite people from different classes. In the latter half of the 19th century, the initial cooperatives were established in Europe (Fiore et al., 2020). The very first Co-operative Society was founded in the English village of Rochdale in 1844, following the Industrial Revolution in Britain. The agrarian cooperative revolution sparked change that raised the need for cooperatives (Höhler & Bijman, 2023). The establishment of numerous creameries, agricultural organisations, and credit unions in Britain by the co-operative movement helped people's quality of life vis-à-vis livelihood improvements.

In the USA, dairy cooperative societies were one of the earliest agricultural cooperative societies to be established and date back to the early 1800s (Sutar Arrawatia et al., 2023). Dairy cooperative organizations have been significant in the production, distribution, and marketing of

milk and dairy products, as well as in the political representation of farmers at the local, state, and federal levels. Many citizens in the USA have had to earn their living via co-operative organizations. Such organizations have resulted to improved livelihood not only in cities but also across the villagers. The U.S. has some diverse worker co-operatives, such as an organic bread factory co-op and an engineering firm (Schmit, 2020). Some have already incorporated environmental and/or Fair-Trade criteria into their products, such as the aforementioned bread-maker, Organic Valley foods, and Equal Exchange.

Co-operative services have also been established in South America. In developed nations, co-operatives are now one of the instruments for growth in agriculture. In Argentina, for example, cooperative agricultural insurance societies were created by farmers working together to improve their economic livelihoods (Malvido Perez Carletti et al., 2017). The same trend spread across the rural areas. They were established during the same times, initially to provide farm loans. Some, like Credit Agricola or Rabobank, evolved into universal banks that provided credits to people thus improving their livelihoods (Galetto & Rossini, 2023).

Large-scale, entirely computerised dairy farming is practiced in America, and cooperatives handle the majority of milk marketing. Cooperatives have therefore given dairy producers in the United States the organisational size required to exercise advantageous influence and successfully negotiate and cooperate with other market actors (Jafri et al., 2024). Developments in both technology and institutions have contributed to the growth of milk cooperatives in Europe (Höhler & Bijman, 2023). Yet, the formation and viability of cooperative dairy businesses cannot be adequately explained by readily accessible milk technology and financial backing provided by cooperative law.

In Netherlands, dairy cooperatives have been around for almost 130 years. From 1950s, their combined market share has over 80% (Verburg, Verberne, & Negro, 2022). This implies that cooperatives are long-lasting businesses in Netherlands' dairy sector (Bijman, 2018). The number of cooperative associations in this nation has increased as a result of a notable advancement in cooperative association's growth (Kingston, 2021).

Dairy cooperatives constitute a crucial component of India's dairy market and milk production initiative, sometimes referred to as "operation flood," which was started in 1970 by Indian government in cooperation with UN World Food Program. Local milk farmers' cooperatives supply commodities and give members access to cutting-edge management and technology, have been the cornerstone of dairy businesses (Sutar et al., 2023). Further, around 1962, initial dairy cooperatives in Indonesia was founded in Pujon. The development of a cooperative was intended to address issues such as low milk output, inferior milk quality, undifferentiated products, unsatisfactory cow quality, and unjust rivalry amongst farmers in milk price.

Further, Brazil has also implemented the cooperative model. For instance, there have been significant independent initiatives to create employee-owned businesses or cooperatives in response to crises in Latin American countries such as Brazil (Silva et al., 2017). In Brazil, the World Social Forum (WSF) process led to the articulation of Solidarity Economics, a modern, activist formulation of cooperativism, with the Movimento dos Trabalhadores Rurais Sem Terra (MST) landless worker's movement demonstrating enormous courage and social entrepreneurship. Various groups have successfully enrolled in co-operatives thus resulting to easy access to credit (Martinelli et al., 2022). Through such initiatives, improved business development has been witnessed, and this has subsequently improved economic livelihood among the masses.

Cooperatives services in Nigeria, as elsewhere in the globe, are created to address shared needs. In the farming industry, cooperatives are thought to be a valuable tool for managing membership risks. Farmers should pool their scarce resources via cooperatives to increase crop production, which could boost socioeconomic activity among members. Ezech et al. (2019) saw cooperatives as a key tool for enhancing farmers' quality of life. In Nigeria, cooperatives are particularly regarded as important instruments for employment creation and for the mobilisation of resources for revenue generation. Cooperatives give farmers in Nigeria access to input, jobs, and services that are locally necessary (Lai-Solarin et al., 2024). They also give farmers the chance to form groups that offer services that would help members produce more to improve their livelihoods.

Agricultural cooperatives are significant rural organisations that help the creation of livelihoods and the eradication of poverty. For example, Ethiopia has recently demonstrated renewed enthusiasm in fostering the development of the cooperative industry in acknowledgment of the significance that cooperatives play (Mersha & Ayenew, 2018). Yet, a more thorough and systematic examination is needed to generate more factual data on the way cooperatives in the nation have impacted the creation of livelihoods and the alleviation of poverty. Farmers who employ the services of the country's cooperatives now have better lives because to higher incomes, more savings, and lower input prices (Molla et al., 2024). Given this information, it is advised to continue promoting, strengthening, and assisting agricultural cooperatives to improve farmers' livelihoods.

For subsistence farmers, particularly in the highlands of East Africa, small-scale dairy production is a significant source of cash revenue (Nyangarika & Bundala, 2020). As a result, the nation has developed a number of initiatives to tackle poverty, especially in rural regions. One of

the crucial tactics for accomplishing the objectives of developmental programmes to improve livelihoods, whereby citizen engagement is a crucial prerequisite, is the formation of cooperatives in the nation. After taking this into account, the government became eager to establish cooperative development policies that allow cooperative organisations, such as micro lending, to help its members and the country as whole in accomplishing developmental objectives and helping to reduce poverty thereby improving livelihoods. For instance, Tanzania's earliest Co-operative Development Policy (CDP) was enacted in 1997 and updated in 2002 to better meet development objectives, especially in the countryside (Anania & Sambuo, 2017). Notwithstanding Tanzania's endeavours and the economic advancements made, the severe poverty prevalent in rural regions still exists.

Kenya, in regard to socioeconomic growth, cooperatives have long been an effective and common aspect of rural life (Feather & Meme, 2018). Cooperatives have made it possible for the economy to be stable and have provided a framework for domestically motivated, community-based investment. The second is especially important since cooperatives benefit communities by establishing collective communication channels and enhancing local decision-making in along with aiding economic progress thus supporting livelihoods (Gyllström, 2023). In Kenya, loan payment, sale of products, services marketing and extensions, and membership education are all handled by service cooperatives. Through such co-operatives, members have been able to access loan at cheaper costs which they ultimately use for the development of their businesses thereby improving their social and economic livelihoods.

In Kenya with a specific focus on Kiambu County, dairy cooperative societies have been founded with the aim of closing socioeconomic gaps and empower communities (Mwebia, 2020). Families can build assets and earn a consistent income through smallholder dairy farming, which

also improves livelihood and empowers the economy. The dairy sector and its affiliated businesses, such as cooperative societies in Kiambu, have nevertheless encountered difficulties that have affected both high- and low-performing businesses' performance (Basu & Galiè, 2021). In keeping with the more significant global trend towards sustainable livelihoods to alleviate poverty and promote sustainable development, these cooperatives serve a crucial role in providing economic sustenance and opportunity for the local community thereby improving their livelihoods.

1.1.1 Dairy cooperative services

In order to aid members in the dairy value chain, cooperatives offer services including collecting milk, accessibility to inputs consisting of veterinary care and animal feed, credit facilities, technical training, and market access. The ultimate goal of these services is to improve individual livelihoods and productivity (van der Lee et al., 2020). By pooling their efforts, facilitating bulk input purchases, facilitating collective negotiating for milk sales, and enhancing access to banking and commercial services, these services strengthen farmers in their business activities (Schmit, 2020). This study used market and credit access alongside training as the preferred dairy cooperative services.

Concerning market access, cooperatives offer a location for members to gather their milk, in order to minimise spoilage and logistical expenses. They subsequently sell the combined to cooperatives (Zavala Nacul & Revoredo-Giha, 2022). By combining milk, negotiating higher prices, lowering transaction costs, and supplying facilities like milk refrigerators and collection centres, dairy cooperatives help farmers reach markets. In order to provide larger buyers with milk from individual farmers, cooperatives serve as collection hubs. Again, milk degradation causes post-harvest losses for smallholder dairy farmers because of inadequate infrastructure for

collecting milk (access). Their livelihoods suffer as a result of their inability to produce enough high-quality raw milk to meet demand of supply (Zkan et al., 2020).

In connection to credit access, dairy cooperatives provide access to financing, including loans for heifers and joint ventures with financial institutions or the establishment of cooperative SACCOs to help farmers manage their finances and obtain capital (Blackmore et al., 2022; Zavala et al., 2022). Because cooperatives provide members with the opportunity for credit via connected SACCOs or agreements with banking institutions, financial services are essential for farmer expansion. These services enable smallholder farmers to expand their enterprises and enhance their standard of living in the dairy value chain by reducing transaction costs and granting access to capital to increase production (Ledo, 2020).

Regarding training, dairy cooperatives provide farmers with educational programs on topics like animal husbandry, business management, milk handling, and better dairy farming methods (Migose et al., 2018). To increase the output of milk and farmer livelihoods, cooperatives offer training in animal wellness, dairy farming management, and dairy standards. To guarantee the dairy industry's long-term viability and profitability, training also covers topics including record keeping, fodder production, and climate-smart treatments. For better cattle health and productivity, accessibility to enhanced breeds, training on how to handle milk properly, and artificial reproductive services are all recommended (Zkan et al., 2020).

Kenya's economy has benefited greatly from its lengthy tradition of cooperative development, which has been marked by steady expansion. Because cooperatives are present in practically every economic area, state acknowledges cooperative societies as an important engine to national growth (Wambui & Gichuki, 2024). In order to leverage the benefit from economies of scale, European farmers founded first cooperative organisation, Lumbwa Co-operative Society-

Kenya, in 1908 having primary goal of buying fertiliser, chemicals and agricultural inputs and marketing farmer product. African small-scale farmers battled to establish separate cooperative organisations. In 1928, Nanyuki Cooperative Creameries, a dairy cooperative society, emerged. Afterwards, Kenya co-operative Ordinance of 1930 was passed, which resulted in legalisation of KCC and KFA in 1931 (Karanja, 2023). All of the cooperative creameries came together to form KCC in 1931.

Arguably, the best examples of this is the Githunguri Dairy Farmers Co-operative Society. It was established by governmental effort in 1961, and by 1998, membership had increased from 31 to around 9,000 (Okello et al., 2021). Since Githunguri lacked a milk processing facility, demise of KCC, a cooperative unit that controlled selling of milk for cooperative societies, had a significant impact on its milk collecting operations. The cooperative's active members fell to approximately 600 due to challenges in marketing members' dairy products, which was its main business (Kiplagat et al., 2024). Nevertheless, deregulation of cooperative movement in 1997 contributed to enhance prospects of Githunguri.

In Kenya, dairy industry is the greatest contributor to agricultural GDP and with quickest rate of growth. Over eighty percent of nation's milk is produced by subsistence dairy farmers, who control two to fifteen lactating cows and predominate the subsector (Mukhovi et al., 2024). Millions of Kenyans rely on dairies for their livelihood. Kenya now has the greatest per capita milk consumption in East Africa, with 125 litres per year (Merem et al., 2022). Tanzania consumes 47 litres of milk per person, compared to 62 litres in Uganda. By 2030, average amount of milk consumed per person is expected to double. According to Migose et al. (2018), domestic milk output has been increasing at a rate of about 5.8% per year in order to fulfil the increased demand for milk caused by the expanding middle class and fast urbanisation.

Dairy industry still faces poor productivity issues and a sizable informal marketing network notwithstanding its potential (Kwamboka et al., 2022). Poor productivity is caused by restricted accessibility to high-quality, reasonably priced inputs and services as well as output markets, as stated by Chagunda et al (2025). To solve issues facing dairy production, farmers have established collective action organisations like dairy cooperatives. By working together, small-scale dairy farmers can lower transaction costs associated with finding markets, acquiring new technologies, accessing better markets, and strengthening negotiating position. Additionally, cooperatives enhance productivity and household welfare, particularly in countryside, and guarantee quality and security of agro-food (Ma et al., 2022).

According to report by Nyokabi et al. (2021), via commercial collaborations, government has given over 350 milk refrigerators to cooperatives. While they wait for customers who purchase from them, these cooling systems help farmers extend milk life. Certain cooperatives have established mechanisms that enable members to get credit secured by future milk deliveries. Gathering and bulking businesses connected to Saving and Credit Cooperative Organisations help to expedite this procedure. The primary source of loans for subsistence dairy producers are the collecting and bulking businesses. Additionally, the use of improved farming technologies and capacity training are made possible by cooperative participation (Arshad et al., 2024).

Numerous research on various aspects of cooperative organisations have been conducted. Prior research has evaluated the effects of cooperative participation on welfare but not on livelihoods in Kiambu County (Chelang'a et al., 2025; Fifin et al., 2024). The findings demonstrated that cooperative participation does, in fact, raise family earnings and productivity. Habiyaemye et al. (2023) examined the effects of joining a cooperative on milk production, net returns, and adherence to food safety regulations. The findings showed that three outcome factors

were positively impacted by membership in a dairy cooperative. Membership' earnings had been positively affected by annual dummy and dairy earnings share. Farmers earnings was not substantially impacted by head of family's age, farming experience, education years, or family size. Additionally, societies gave their member farmers opportunity to use services including feed, animal health care, and artificial insemination. Yet, since farmers preferred other marketing channels, involvement in these cooperative groups is still modest. Additionally, it is unknown how joining such cooperatives as a marketing channel will affect wellbeing.

1.1.2 Livelihoods of local community farmers

In developing nations, dairy industry is crucial to rural livelihoods, especially for impoverished. According to estimates, the industry accounts for almost one-third of agricultural GDP in emerging economies, and this percentage is growing (Adesogan & Dahl, 2020). The rapidly increasing demand for animal products, particularly as a consequence of an expanding urban population and expanding consumers wealth, is responsible for sharp rise in livestock output amongst nations. As a component of livestock industry, dairy production is recognised as a significant agricultural activity, specifically in developing nations, where it gives many individuals, notably those living in countryside, additional income, jobs, and nutrition (Yadav et al., 2021).

In order to combat poverty and promote sustainable development, developed and developing countries are aggressively pursuing sustainable livelihoods (Abukari & Mwalyosi, 2020). This goal includes the eradication of poverty as well as the appropriate use of natural resources and the incorporation of all-encompassing development techniques (Alarcón & Sato, 2019). In order to develop livelihood strategies that can survive various shocks and stresses, societies attempt to align their economic, social, and environmental systems by embracing a

sustainable way of life that includes enrolling into dairy cooperatives (Uddin, Pervez, & Gao, 2022). Therefore, the promise of guaranteeing livelihoods for current generations and delivering net benefits to future generations on both local and global scales has made this shift toward sustainable living a focus for policymakers and development practitioners (Mhembwe & Dube, 2017; Garai et al., 2022; Basu & Galiè, 2021). In fact, via cooperatives farmers' lives have transformed.

In developed nations, such as Thailand, co-operatives are now one of the instruments for growth in agriculture for farmers. The cooperative agricultural insurance societies were created by farmers working together to improve their economic livelihoods (Malvido Perez Carletti et al., 2017). The same trend spread across the rural areas where farmers enhanced livelihoods have been realized. In fact, they were established during the same times, initially to provide farm loans to improved dairy production (Jitmun et al., 2020). Additionally, Brazil has also implemented the cooperative model that includes independent initiatives to create employee-owned businesses or cooperatives in response to crises for farmers to improve their livelihoods (Silva et al., 2017). In fact, farmers have successfully enrolled in co-operatives thus resulting to easy access to credit thereby enhancing their economic empowerment.

In Africa, dairy cooperatives in Ethiopia are created to address shared needs. In the farming industry, cooperatives are thought to be a valuable tool for managing membership risks (Belay, 2020). Farmers should pool their scarce resources via cooperatives to increase crop production, which could boost socioeconomic activity among members thereby improving their livelihoods. In Ghana, cooperatives are particularly regarded as important instruments for employment creation and for the mobilisation of resources for revenue generation (Amoako, 2021). Cooperatives give

farmers the chance to form groups that offer services that would help members produce more thus increasing their livelihoods.

In addition to contributing to Kenya's GDP, dairy sector employs over one million individuals. Yet, it continues to face widespread informal marketing along with poor productivity (Otieno, Muendo, & Mbeche, 2020). As a result, farmers have established agricultural cooperatives that offer opportunities for dairy services, artificial insemination, livestock wellness, and assistance with cooling facilities. Membership of these cooperative organisations still participate at a low rate, and it is unknown how involvement affects income and consequently, livelihoods.

For instance, Kitinda Dairy Cooperative Society physically pasteurises and sells fresh milk and solely manufactures cheese, fermented milk, and yoghurt. Fresh milk is chilled and stored by the Naitiri and Kaptama Dairy Cooperative Societies before being sent to manufacturers who eventually process them (Okello et al., 2020). By 2016, four of the fourteen cooperatives that were in existence (or 28.6%) had purchased and built coolers: Kikai Dairy Society, Kitinda Dairy Cooperative Society, Kaptama Dairy Cooperative Society, and Naitiri Dairy Cooperative Society. As of right now (2025), more than 30 cooperatives installed and are running milk coolers with ambitions to enhance value (Kiplagat et al., 2025).

According to Kuhn et al. (2025), cooperatives have insufficient processing ability to manage huge amounts of milk particularly in rainfall periods. This has been brought on by inadequate infrastructure and varying amounts of milk supplied to them. Among other issues, majority of cooperatives encountered problems with inadequate financial management and liquidity issues. In fact, majority of dairy societies have failed due to inadequate financial management, according to findings from Nabiswa (2020) with dairy cooperative managers.

Further, due to farmers' late payments, most of them are now selling to unofficial retail vendors who seem to pay on time.

1.1.3 Local community farmers in Kiambu County, Kenya

Notable cooperatives including Githunguri and Ndumberi Dairy Farmers Cooperatives assist local dairy farmers in Kiambu County by facilitating them access to markets and enabling them to process milk into goods such as Fresh (Wanjala, 2023). These farmers, who are frequently smallholders, have a connection with markets in Nairobi and elsewhere, government assistance, and sensitization in contemporary methods like hybridising Friesian cows for increased yields (Kiplagat et al., 2025). Due to their high milk output and tolerance to disease, Friesian cows, Jersey, and Ayrshire are prominent breeds in the region (Mugwe, 2021). Owing to the region's propensity for dairy production, farmers from neighbouring counties go to purchase dairy cows, which supports Kiambu's dairy cow farmers.

Kiambu has drawn farmers from other areas to learn about and purchase dairy cow breeds in an attempt to obtain cows that produce a lot of milk. Kiambu is one of the counties that has been deemed suitable for dairy farming because of its favourable climate, infrastructure, and record as the county with the highest milk production in the nation (Githendu, 2023). As a result, certain dairy farmers in the area now specialise in breeding, particularly heifer cows, in addition to keeping cows for milk and meat in order to increase their incomes.

1.2 Statement of the Problem

Cooperatives serve significant roles in the establishment of a variety of economic and cultural spheres if created willingly and run freely (Alarcón & Sato, 2019). The development of strong social capital, the reduction of labour mobility, and the utilisation of resources like capital towards local growth are only a few of the reasons why cooperative links are crucial. The

impoverished have many options to escape poverty and other forms of hardship thanks to cooperatives (Tonui, 2020). They also play a significant role in promoting local economic growth and enhancing local populations' standard of living. Therefore, cooperative thus play a substantial economic role in national economies.

In Kiambu County, the dairy sector and its affiliated businesses, such as cooperative societies and dairy farmers have encountered difficulties that have affected both high- and low-performing businesses (Basu & Galiè, 2021). Further, issues to do with market access, inadequate farming skills and knowledge and lack of information on credit access has impeded many dairy farmers from scaling dairy farming activities. These alongside poor road networks, especially for remotely located farmers has derailed timely delivery of products to the market thus negatively impacting livelihoods.

Although several studies (Garai et al., 2022; Mwebia, 2020) have examined various facets of Kenyan agricultural and cooperative movements, there is still a clear knowledge gap about the specific impact of dairy cooperatives on the way of life of nearby communities in Kiambu County. Further, Wathika and Indabu (2023) studied impact investing and sustainable livelihoods for farmers in Githunguri Sub-County. However, the study was only limited to one subcounty while the current focused on the entire county to bridge the methodological research gap. Again, Kabuga (2024) focused on education, training, and Kiambu County's smallholder dairy farmers' productivity but the research did not use livelihoods as dependent variable hence a research gap. Mbichi and Maina (2024) looked at marketing strategies and dairy farms performance in Kiambu County. Nevertheless, the study was only limited to marketing services while current research included market and credit access together with training to bridge the conceptual research gap.

Hence, this study assessed dairy cooperative services and livelihood of local community farmers in Kiambu County, Kenya.

1.3 Objectives of the Study

1.3.1 General objective

The study evaluated effect of dairy cooperative services on livelihoods of local community farmers in Kiambu County, Kenya.

1.3.1 Specific objectives

- i. To evaluate the effect of market access on livelihoods of local community farmers in Kiambu County, Kenya
- ii. To assess the effect of credit access on livelihoods of local community farmers in Kiambu County, Kenya.
- iii. To analyze the effect of training on livelihoods of local community farmers in Kiambu County, Kenya.

1.4 Research Questions

- i. What is the effect of market access on livelihoods of local community farmers in Kiambu County, Kenya?
- ii. What is the effect of credit access on livelihoods of local community farmers in Kiambu County, Kenya?
- i. What is the effect of training on livelihoods of local community farmers in Kiambu County, Kenya?

1.5 Justification of the Study

Dairy farming contributes significantly to socioeconomic standing of a significant portion of rural residents, particularly in emerging nations, by giving poor additional income and

employment options. Despite sharp rise in demand for cattle products, data shows that a large percentage of farmers in developing nations still practise subsistence farming (Nabiswa, 2020). Because subsistence farmers have been among the more populous and impoverished of all farmers, several nations are trying to boost milk supply by helping them integrate into markets.

Kenya's economy equally depends on the productivity and production of dairy products. It is a significant source of nourishment and a direct and indirect revenue sources. Sustainable growth of dairy industry can be greatly aided by cooperatives. In this vein, government has encouraged small-scale farmers to become members of cooperatives to strengthen their negotiating position, obtain access to inputs and training, and boost productivity (Maswili, 2025). Cooperatives have also been designated by government as an entity with a particular purpose to accomplish Vision 2030 and the SDGs. The 2019 Cooperative Policy, that recognises contribution of cooperatives to the accomplishment of numerous development objectives, further emphasises this. Nevertheless, as dairy industry is not sustainable, local manufacturing of dairy goods and milk has not sufficiently served markets (Vuvor et al., 2025). As a consequence, more dairy products were imported, which further harmed Kenya's dairy industry's ability to grow sustainably. Additionally, it is necessary to comprehend the obstacles to dairy cooperatives' increased market competition in order to boost farmers' financial prospects. As a result, the investigation would have ramifications for academia, policy, and practice.

Comprehensive studies on the impact of cooperatives on the livelihoods of local communities' economic well-being are lacking, particularly in Kenya and the particular situation of the cooperatives in Kiambu County. By offering insightful information on the topic, this study seeks to close this knowledge gap and add to the body of literature (Ferronato & Torretta, 2019). The study's findings will add to the body of academic knowledge on the subject by thoroughly

analyzing how industrial zoning affects the economic well-being of nearby towns. This can be a basis for upcoming research, policy creation, and well-informed decision-making.

1.6 Scope of the Study

The aim of research was to evaluate effect of dairy cooperative services on livelihoods of local community farmers in Kiambu County, Kenya. The variable scope included market access, credit access, training, and livelihoods. The population scope included 20 cooperatives with a population of 73,319. Theoretically, the study was limited to cooperative theory, livelihoods framework, and social capital theory. Geographically, the study only focused on dairy farmers within Kiambu County. Meanwhile, regarding time scope, the research was done between the month of September and October, 2025.

1.7 Significance of the Study

1.7.1 Communities

The rural communities of Kiambu County are the main benefactors of this project. It is essential to comprehend how dairy cooperatives affect their livelihoods because this directly impacts their standard of living. By generating reliable revenue sources, expanding employment options, and improving access to markets for dairy products, the findings can significantly improve their economic well-being. Additionally, by giving local citizens a stronger collective voice, enhancing their bargaining power, and expanding their access to necessary resources and support services, this information can empower them and ultimately improve social and economic situations.

1.7.2 Policy-makers

The research findings can be a valuable resource for decision-makers in government and the policymaking process. They may more efficiently manage resources, create development

programs that meet the needs of these areas, and create laws that encourage the expansion of dairy cooperatives by understanding how dairy cooperatives affect rural communities. This may result in more focused expenditures in rural development and ultimately support achieving more general socioeconomic objectives.

1.7.3 Dairy cooperatives and management

This study can help dairy cooperatives by giving them a thorough grasp of what they can do to help local communities grow. The management can then improve their operations and tactics to better serve the interests of their members with the help of the study as they plan strategically. These groups may increase their reach, impact, and sustainability by understanding how cooperatives support rural development.

1.7.4 Academic and research

Building on the knowledge provided by this study will benefit the academic and research communities. Specifically, researchers and academics can utilize this research as a starting point for more exploration and analysis because the findings add to the knowledge on cooperative dynamics and their effects on rural development. This can help to advance current research and scholarly discussion in the field by creating a more excellent knowledge of cooperative models and their more significant implications for sustainable development.

1.7.5 Farmers

Dairy farmers within the county will gain knowledge and skills from training that will enhance their marketing ability alongside credit access and subsequently, management of acquired funds to improve livelihoods.

1.7.6 National and county governments

The research's recommendation will benefit both national and county governments. Specifically, it will help both governments to grasp the benefit of creating an enabling business environment that will enhance the operation of both the cooperatives and farmers within the county.

1.7.7 Student researcher

The study was beneficial to the principal researcher since it helped the student to gain more knowledge concerning how the available cooperative services such as market access, credit access, and training provided by the cooperatives improved the livelihood of Kiambu County residents.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, theoretical frameworks governing this research were presented. The second part entailed presentation of empirical studies in line with the research objectives. Further, the literature summary and gaps are also presented in the third section. The last section consisted of conceptual framework.

2.2 Theoretical Review

2.2.1 Cooperative theory

The theory lacks specific author. Actually, it is believed it emerged in the 17th century and one of its proponent is Owen (1771–1858). The cooperative theory is the foundation for understanding how cooperatives function and their significance in many economic areas, such as agriculture and dairy production. One of the key ideas in this framework is the Rochdale Principles, which emerged in 1844 in Rochdale, England, during the founding of the first modern cooperative (Nelson et al., 2019). These principles emphasise several significant ideals, including inclusive membership, democratic control, and community service. Open membership implies that cooperatives are hospitable by allowing individuals from various backgrounds to join voluntarily, regardless of their social or economic standing (Nelson et al., 2019). With each member having an equal voice in deciding the cooperative's direction, democratic control emphasises the importance of fair decision-making processes (Deng et al., 2021). The principle of "one member, one vote" is another aspect of the democratic ethos; it ensures that every member, regardless of the size of their investment, has equal power.

Following the Rochdale Principles, the cooperative's involvement in the community it serves is of utmost importance. This "Concern for the Community" principle highlights the cooperative's need to positively contribute to its region's social and economic development outside of the pursuit of financial gain (Malherbe, 2019). These guidelines offer a solid foundation for assessing dairy cooperative operations and their capacity to enhance local communities in Kenya's Kiambu County. By sustaining these ideals to encourage a sense of ownership and group responsibility among their members, dairy cooperatives aim to establish the trust and teamwork necessary for their success.

According to Nelson et al. (2019), the collective identity is a distinctive business model combining the best aspects of the private and public sectors. This identity enables cooperatives to balance achieving social and community-oriented aims and pursuing profit. By producing jobs, ensuring food security, and promoting sustainable agriculture, dairy cooperatives that adopt this model want to help their members economically and the more significant social fabric. In light of their importance in fostering economic democracy, social cohesion, and community development, these organizations become a crucial part of the socioeconomic landscape in Kiambu County and beyond, according to cooperative theory.

According to Dufays et al. (2020), based on the Rochdale Principles and collective identity, cooperative theory offers a solid foundation for comprehending dairy cooperatives' principles, organization, and goals. These values, which are the cornerstone for evaluating the influence of dairy cooperative services on the way of life of local community farmers in Kiambu County and other areas, emphasize open membership, democratic governance, and dedication to community welfare. Dairy cooperatives strive to follow these ideals to enhance not only the financial security of their members but also to positively influence the overall social and economic growth of their

local communities. This theory is used to inform the independent variable, dairy cooperative services hence its relevance to this study.

Cooperative theory has, nevertheless, consistently been questioned and criticised. For example, the word "cooperation" itself is vague, and it is still unclear if cooperative principle (CP) is part of a set of norms or principles. The explanations of the infractions are not very compelling. In fact, some researchers' misconceptions have led to these critical viewpoints. First, it fails to provide a self-definition of "cooperation" in the CP; second, proponents confuse the ideas and connections between the conversational maxims and the cooperative principle; Thirdly, they jail the maxims by indiscreetly forcing the cooperative nature within the CP on them.

2.2.2 Livelihoods framework

The theory was authored by Chambers and Conway in 1992. The Livelihoods Framework offer a broad and multifaceted lens to examine and comprehend the methods and resources people and communities use to enhance their well-being and standard of living (Nasrnia et al., 2021). This paradigm recognizes that people's ability to support themselves depends on various skills and resources. Human, social, natural, physical, and financial capital are the five main divisions of these assets (Hossain et al., 2023).

According to Nasrnia et al. (2021), community members' knowledge, skills, education, and physical and mental health are all part of human capital. It acknowledges that human resources are essential for raising the standard of living. For instance, in the context of dairy farming and cooperative services in Kiambu County, farmers' education and training in contemporary dairy farming techniques and cooperative management can significantly improve their capacity to generate a stable income from dairy activities. The theory is applicable to this study because it

argues improved livelihoods based on income generating activities which in this study includes dairy farming activities.

There are some objections to the theory. The utilitarian emphasis on finances and possessions at the cost of culture and religion, its propensity to ignore past events and structural variables, its excessive complexity that results in insurmountable quantities of information, and its lack of theoretical foundation in clarifying the fight for resources are just a few examples. Although the framework strives for a holistic picture, its initial versions have been accused of being depoliticised. It can also oversimplify dynamics or become bogged down in complexities, rendering an impartial assessment difficult.

2.2.3 Social capital theory

It was introduced by Bourdieu in 1986. Social capital theory has grown popular in the social sciences, especially sociology, economics, and political science. This theory's basic idea is that social networks, relationships, and the trust they contain are essential resources that can significantly impact people, communities, and societies (Gannon, 2020). The premise behind social capital is that interpersonal relationships and connections have intrinsic value beyond the sum of their constituent parts. The local populations of Kiambu County, Kenya, are very relevant to the Social Capital Theory, according to Ferlander (2007).

The concept holds that social relationships within a community, such as those formed via participation in dairy cooperatives, can significantly impact how well its inhabitants can sustain themselves. The social capital hypothesis relies on the contrast between "bonding" and "bridging" social capital. According to Gannon (2020), "bonding social capital" refers to the close ties and solid bonds among a group or community members, such as a dairy cooperative. These strong bonds may inspire members to lend a hand to one another, cooperate, and pool their resources. In

the case of dairy cooperatives, these close links can result in group decision-making, cooperative marketing projects, and resource pooling for the benefit of all members.

However, building linkages between distinct communities or groups is necessary to bridge social capital. In the case of dairy cooperatives, this may entail contacts and partnerships between various cooperative societies or between cooperatives and other stakeholders such as governmental organizations, customers, or financial institutions (Gannon, 2020). By bridging social capital, the cooperative may reach a wider audience and have a more significant influence. Furthermore, according to the Social Capital Theory, trust and social networks can promote cooperation and exchanging knowledge and resources. Dairy cooperatives in Kiambu County give members a place to collaborate productively. They advertise their dairy products jointly, bargain better prices with customers, and use training and extended services. These cooperative activities are frequently supported by the social capital created within the cooperative, which develops community among members, fosters trust, and gives members the confidence to collaborate for their mutual benefit.

The Social Capital Theory provides a valuable framework for comprehending how social ties, networks, and trust within dairy cooperatives affect the standard of living in Kiambu County's local communities. It emphasises that cooperative involvement has advantages beyond economic ones and is essential for promoting social cohesiveness, information exchange, and group action. Through these strategies, social capital greatly enhances community members' general well-being and resiliency. Therefore, it is used in this study to link credit and market access with the livelihoods of dairy farmers.

The term "social capital" and the query regarding if it qualifies as "capital" are the most open criticisms of the concept. This is a prevalent argument that has been present in social capital research. It comes from the bad analogy that the phrase "social capital" tries to draw. The reality

that social capital can have both good and negative effects makes it inconsistent with the term capital, in addition to not fitting into the conventional idea of capital. Many prominent economists, like Robert M. Solow, are among the many who oppose the inclusion of capital.

2.3 Empirical Review

Through many tests and observations made with the aid of prior studies, empirical examinations assist in confirming conventional research. The investigation being undertaken becomes more legitimate and professional because of the empirical evaluation. The work includes empirical reviews of past research.

2.3.1 Market access and livelihoods of local community farmers

The primary goals of dairy cooperative services in Kiambu County, Kenya, are to promote job opportunities and livelihoods. Empirical studies regularly provide evidence of the beneficial effects of these cooperatives on the elements above, highlighting the practical significance of the theoretical framework expounded in this paper.

In Sri Lanka, Thenuwara Acharige (2022) did a livelihood analysis on dairy farmers participation in milk markets. Secondary data from the literature review was utilised in the study. According to this study, because they had other reliable sources of income, smallholders were not so dependent on selling milk. Nevertheless, given the unpredictability of their revenue streams, milk sales were extremely important for smallholders with limited resources. This study contends, based on important findings, that the broad range of dairy producers must be taken into consideration in development policies pertaining to dairy commercialisation. Similar to this, connecting smallholders to the formal market might necessitate various interventions meant to alter each farmer's beliefs and values regarding dairying and equip them to interact with established organisations within the formal market by assisting in the expansion of their entire asset portfolio.

In India, Ali et al. (2025) assessed Direct Market Access (DMA) influence on profit (PM) margins, supply, and dairy farmers economic resilience. 248 farmers in all took part, accounting documents and structured surveys were used to gather data. ANOVA, multiple regression, t-tests techniques were used. According to findings, farmers who used DMA reported considerably more PM compared to those who used TMA. By lowering transportation expenses, delay to market, and wasted products, DMA improves SSE; efficiency ratings change significantly. Years of Experience (YoE), Farm Size (FS), and Education Level (EL) all have a significant impact on agricultural outcomes. Considering farms are large operations with a lot of resources to utilise, they have been greater scale efficiencies on larger farms. Education improves new technology, broadens knowledge, and motivates them to use performance monitoring. Decisions made with adaptive strategy, handling risks, and practical expertise are more effective as a consequence of YoE. Each of above factors are constant; for instance, large farms and educated producers with expertise have highest possibility of implementing new techniques and optimising profits and output. These enhancements give farming enterprises resilience, sustainability, and efficacy. DMA improved ER, which helped farmers sustain steady incomes and easily endure market swings. These results were additionally impacted by important variables like FS, EL, and YoE, with larger and better-educated farmers reaping more benefits through DMA. According to findings, DMA is a workable plan for enhancing financial sustainability. Nevertheless, to guarantee everyone receive full benefits from DMA, efforts to eliminate gender imbalances and provide education and building capacity are crucial.

Research by Jayasena et al. (2019) researched on a livelihood analysis on smallholder participation in milk markets in Sri Lanka. In Gonapinuwala, Southern Sri Lanka, 28 smallholder farmers serve as the case study for this research. Three types of smallholders were established

through data analysis, which was based on differences in milk selling, production practices, and livelihood portfolios. The portfolios that these groups possessed influenced how they conducted their commercial dairying. Furthermore, the importance of business dairying for smallholders' livelihoods was determined by how they assembled their portfolios of livelihoods. Results showed positive significance of supporting dairy farmers to access markets to improve livelihood. However, the study was done in a developed country that has a variation in context hence a contextual research gap that calls for the current study. This study attempted to bridge the gap by assessing the effect of market access on livelihoods community farmers with a specific focus on Kiambu County.

In Birar, Kumar et al. (2018) evaluated market-led extension approach for dairy farmers' livelihood security. A carefully planned interview schedule attracted 240 responses. Over the past 60 years, the nation's agricultural output has grown significantly, but this hasn't translated into higher farmer compensation. It is thought that insufficient marketing infrastructure and ineffective marketing channels are to blame for both the high and volatile consumer pricing and the fact that only a small portion of consumer rupees reach farmers. Extension agents must thus play a significant role in helping farmers develop their ability to handle new obstacles and in helping them obtain higher prices for their produce. This change in extension is known as "market-led extension," and it hasn't received much attention in the extension context up to this point. Therefore, focus of the extension ought to change from just production to end-to-end market-led extension. While mean livelihood security index score was 0.61 in general, over four-fifths (82.92%) of those surveyed had medium to high levels of livelihood security.

In Ethiopia, Mengistu and Meressa (2023) investigated dairy farmers' choice of milk market outlets. To analyse the data and look into what influences farmers' decisions to sell to local

markets, study employed the multinomial logit model. The findings indicate that, in comparison to local milk customers, farmers are more likely to choose the milk production pathways based on the total number of dairy cattle, family size, and the comparable cost of milk. Farmers are more likely to select cooperative market outlets when they have access to knowledge, farming expertise, health rules, cooperative association membership, and market information. On the other hand, farmers' choices of hotel/restaurant channels are influenced by their availability of dairy extension services and payment methods. However, because it was conducted in Ethiopia, a localised study was required.

In yet another study, Ouma et al. (2020) researched on the opportunities and constraints to smallholder dairy market development in Burundi. Five communes from three sample provinces in the target PRODEMA areas in Burundi were the location. The CGIAR Research Programme on Livestock value chain evaluation methods were employed in the study as part of a participatory appraisal technique. Focus groups, key informant interviews, and a wrap-up workshops with members of these groups comprised the discussion formats. The study found that, the main point of contact between dairy farmers and milk dealers (collectors) in milk producing areas is the marketing of milk products across the three regions, however transportation was somehow hectic to some farmers. They perform the crucial function of gathering milk that is produced by the numerous smallholder farmers, who are frequently dispersed throughout various geographic regions and are frequently too distant from the market hubs. Nevertheless, the study was done in Burundi, a country with varied geographical scope hence the call for the current study.

Further, Migose et al. (2018) studied the impact of urban market distance on the growth of smallholder dairy farming systems. Three different areas were selected for the farms, ranging in distance from Nakuru Town's urban market. In-depth interviews with farmers and focus groups

including eight stakeholder groups were conducted in order to gather information and testimonies regarding dairy cattle's roles in the market, farm performance, and production issues. The study utilised ANOVA to assess agricultural data and thematic content analysis to analyse qualitative data by grouping narratives based on predetermined themes. It was discovered that the timely transit of dairy products was impacted by distant markets, which in turn hampered the lives of small dairy producers. Milk was comparatively inexpensive in both official and informal market chains in the rural areas and this attributed to too much milk production by farmers. The study however focused on smallholder dairy farming system development but not co-operatives hence a contextual research gap. Further, despite the relevance of the research to this study, it did not expressly use livelihood as dependent variable. The current study thus attempted to bridge the conceptual research gap by assessing the influence of market access on livelihoods amongst the farmers in Kiambu County.

In Kenya, Wangu et al. (2021) assessed determinants to market orientation and marketing arrangements by dairy farming in rural Kenya. It employed a case study approach, combining both quantitative and qualitative research methods for a more complete empirical inquiry. The findings demonstrate that irrespective of the external support provided through marketing opportunities such as farmer co-operatives, smallholders' engagement in commercial farming and marketing is dictated by the socioeconomic attributes and market perceptions that are heterogeneous among households in a smallholder community. The study equally revealed that distance to market influenced access to customers and this lowered income generated from dairy products. The study nevertheless relied on information from the rural populace while current study assessed how dairy co-operative services have helped to create access to markets by both rural and urban farmers thereby improving livelihoods.

Additionally, Wangu et al. (2021) focused on dairy farmers' market orientation and marketing arrangements. It used a case study methodology, integrating qualitative and quantitative techniques to provide a more thorough empirical investigation. The results show that smallholders' participation in agricultural production and marketing is determined by socioeconomic characteristics and views of market that vary between families in a small-scale society, regardless of the outside assistance offered via marketing opportunities like farmer organisations. Yet, a significant percentage of smallholders aren't able to participate in market-oriented farming or might choose to utilise current alternative marketing systems, depending on the socioeconomic background of specific households, even in setting where farmers' organisations are actively marketed.

Ongwech et al. (2022) analyzed milk marketing channels and improved dairy value chain competitiveness. A representative group of 230 farmers had their data gathered through standardised questionnaires, and inferential as well as descriptive statistical techniques were used for analysis. The survey found three marketing channels: direct sales, milk bars, and milk processors showed statistically significant differences in milk yield, on-farm income, and years of education. According to logistic regression, marketing channels were strongly impacted by marriage status, extended accessibility, association involvement, mode of payments, and transport ownership. According to other findings, majority had no accessibility to market data. Consequently, it suggested policies that would increase the number of individuals with formal schooling and market knowledge to help choose best marketing channels, increase training on dairy farming techniques to increase milk production, improve access to transportation facilities to improve milk distribution to milk gathering centres, and review the payment agreements across dairy processors and farmers to prevent the issue of postponed payments.

In Kenya, Nabiswa (2020) established dairy cooperatives role in sustainable dairy development. The investigation employed a descriptive survey methodology, and desktop reviews and questionnaires were employed. Dairy cooperative supervisors, livestock production officials, county cooperative officials, and cooperative members were sampled. The findings demonstrated that the advantages that cooperative societies provide to small-scale milk producers are not shared equally. Accessibility to knowledge, the capacity to save, and budgeting received the lowest marks, whereas assured markets and increased income received moderate values. In Kenya, dairy cooperatives primarily provided marketing and milk gathering services. Cow insurance services, nonetheless are the least available. The findings also demonstrated that attainment of long-term dairy development depends on interactions among dairy cooperatives and participants in dairy value chain. An examination of Kenyan dairy cooperatives showed that, in spite of threats and weaknesses like dairy products' importation and poor infrastructure, taking advantage of current opportunities and utilising natural advantages of cooperatives could enhance long-term prosperity of dairy industry. The investigation suggested identifying factors influencing dairy cooperatives' performance as well as ways to improve their advantages.

2.3.2 Credit access and livelihoods of local community farmers

The impact of dairy cooperatives on the livelihoods of local communities in Kiambu County, Kenya, is significantly influenced by access to resources such as credit. The elements above strongly correlate with cooperatives' capacity to offer financial services to its members. The dairy cooperatives in Kiambu County play a significant role in facilitating credit access among their members through banking services. Karanja and Kibiego (2020) propose that the services offered may encompass savings accounts, loans, and credit accessibility. Individuals can obtain the required financial resources to allocate towards their dairy enterprises, procure vital resources

such as feed and equipment, and enhance the scale of their activities. The phenomenon of spillover effect has been extensively documented in several studies (Gathuru & Ngigi, 2017).

In Bangladesh, Uddin et al. (2022) researched on voluntary cooperativisation's effects on livelihood capital of dairy farmers. 255 individuals were surveyed using a basic random sample technique. In the opinion of nearly every farmer, the fee-based service was profitable. The percentage of farmers who achieved moderate and high gains from dairy farming was equal. The biggest gains were in individuals, financial, and physical capital resources. It was revealed that production has increased thanks to the credit facility, and the farmer-to-market connection has become stronger, maximising revenue and profit. Farmers used their increased revenue to construct tangible assets. Through the CDVF services, farmers were able to increase their knowledge, skills, employment, voice, social networks, green homesteads, and livelihood stability. The findings of the regression confirm that the factors that determine farmers' better asset base are gender, education, distance from the dairy center, greater milk output, and higher income.

In Indonesia, Purwanti et al. (2023) focused on unlocking credit access for dairy farmers. Descriptive statistics and a Probit Model were used in this study to examine data gathered via a questionnaire. Using a multistage random sample technique, 70 farmers were included. The results showed that a number of factors, such as farmers' educational attainment, collaterals, ownership of cattle, internet connectivity, involvement in dairy training programs, and family members' work, have a substantial impact on farmers' decisions to use loans. These characteristics' beneficial effects highlight the significance of focused initiatives to improve farmers' access to financing. In order to encourage farmers to accept credit access, cooperation between government agencies and stakeholders is crucial.

A study by Mundia et al. (2023) investigated how agriculture cooperatives helped rural populations in Zambia's Kabwe district improve their standard of living. 229 closed-ended questions were employed as data collecting instruments in conjunction with a case study methodology. Regression analysis and descriptive statistics were employed in the investigation. The results showed that having access to affordable credit for farmers raised household income, which in turn contributed to higher household income. Furthermore, in a binary logistic regression model, social capital and cooperative training had no effect on the rise of cooperative members' income levels although the dependent variable—household income growth—was significant at 1%. The context of this study varies from the ones witnessed in Kiambu County hence the need for the current study. Therefore, this study bridged the gap by assessing the effect of credit accessibility on livelihoods amongst dairy farmers of Kiambu County.

In another study, Raniga (2021) studied cooperatives' economic development role in enhancing women' livelihoods in Gauteng-South Africa. The research used qualitative technique and reported data from eight women who participated in cooperatives in Gauteng. This study discusses creating social economic capital such as offering friendly credit facilities to women to boost the growth of their businesses and this was alongside bearable payment periods. In the end, this collaborative initiative offers a constructive social and economic development method by providing financial support that supported women in achieving improved livelihoods. Nonetheless, it only focused on women in South Africa. The target population was also small and this could have presented methodological bias. This study bridged the identified gaps by having a broader population and sample size that enhanced the accuracy of the results that was obtained.

In addition, Yunusa, Micheal, and Joseph (2018) assessed cooperatives' contribution to the economic development in Kogi State-Nigeria. The main information were collected utilising oral

interview and questionnaire, which were given to 286 farmers who were randomly selected among various cooperatives. Findings indicated that over 40% of respondents had noted improved livelihoods based on the economic value such as financial support that was brought by their enrollment into co-operatives. Nevertheless, it showed a correlation between economic empowerment (financial support) resulting from co-operatives and livelihood improvements. The study suggests that in-depth local agents educate the people to improve their access to production technology, which will result in a rise in income. The study was nevertheless done in Nigeria, a country with different economic environment thus the necessity for local study that focused on establishing the effect of credit access on livelihoods among Kiambu County dairy farmers.

Further, Solomon (2022) studied the impact of Awach cooperative societies' participation on members' livelihood. The sample size of the research was 382. Participants were chosen at random. Focus groups and structured questionnaires were used to gather qualitative as well as quantitative information, respectively. The propensity score matching approach and descriptive analysis were applied. The research discovered that financial support in the form of microcredit with accommodative repayment terms had a significant and positive impact on the members' usual monthly income, consumption expenditures, health care, schooling, job generations, and dwellings condition. However, the study used members' participation as independent variable while the current study utilized access to credit as independent variable. Therefore, a localized study with aim of finding out the effect of credit access resulting from cooperatives on members' livelihoods was important.

Moreover, research by Waliaula (2017) assessed Agrarian co-operatives' effect on social-economic development in Sirisia constituency. The methodology used was a descriptive survey. Data gathered was qualitative and quantitative in nature. 534 cooperative individuals were its

target. 107 participants were chosen at random employing stratified sampling procedures. The results showed that the contemporary cooperatives have relatively minimal positive influence on the quality of life for the people living in the neighborhood. It found that cooperatives had a strong positive relationship with livelihood because it empowered their economic development through provision of cheap credits to farmers who in turn used such loans to improve their dairy activities. Despite that the study was done in Kenya it only relied on information from Sirisia thus excluding Kiambu that is the bedrock of Dairy farmers. To bridge the gap, the stud focused on all farmers in dairy cooperatives in Kiambu County to determine how they have enhanced livelihood for the community farmers.

In Kinangop Sub-County, Wadaya (2022) researched on credit access and dairy farm income. A total of 230 respondents were sampled from a population of 35,840 smallholder dairy farmers using both stratified and simple random sampling techniques. The study adopted descriptive survey research design, descriptive and inferential statistical methods in data analysis. From the descriptive analysis, respondents' socio-economic profiles were relatively homogenous across the wards. Moreover, significant variations in farmers' gender, form of management, financial education status, association membership status and value addition practice were observed between credit users and credit non-users. Significant differences in income of farmers characterized by gender, financial education status, association membership status and value addition practice were also observed. Furthermore, compared to credit non-users, borrowers had significantly higher levels of dairy output, additional income, on-farm income, land size, area under forage production, higher dairy animals. Additional findings show that 65.65% of those surveyed did not use credit. However, a greater number of women experienced financial exclusion. The participant's average household size was four people, and they had an average of seven years

of education. Farmers typically generated 341 litres each month, had two dairy animals per home, and had been in the business for 11 years. According to binary logistic, credit availability was favorably and significantly impacted by financial education, association affiliation, quantity of dairy cattle, education duration, savings' frequency, and marital status as the major occupation.

Njeri (2021) studied credit management influence on dairy cooperatives' financial performance. A descriptive design was used for investigation. Analysis was done using secondary data. Population totaling 1,245 dairy farmers was used and sample chosen by census. Regression models were used to analyse the data. High levels of illiteracy among cooperative members were one of the limitations encountered during data gathering. This was managed by guiding staff throughout many aspects of credit management so they could comprehend the ideas being investigated. The results demonstrated that return on investment, a gauge of the financial performance of Kenyan dairy cooperatives, was significantly impacted by credit management. Additionally, significance tests revealed impact was significant.

2.3.3 Training and livelihoods of local community farmers

Establishing training and sensitization is essential in understanding dairy cooperatives' influence on livelihoods of Kiambu County. Training and sensitization have a crucial role in augmenting the collective well-being and resilience of the community. The existence of training and sensitization in cooperatives enables people to gain skills, knowledge, abilities, and competency (Kariuki & Maina, 2019). As a result, this phenomenon improves the ability of small towns in Kiambu County to preserve their economic structures and improve livelihoods.

In Turkey, Research by Kustepeli et al. (2023) examined the effects of cooperatives on the human capital empowerment and bettering of living conditions. Semi-structured in person questionnaires were used to gather data. Data was analysed using descriptive statistics. The

findings via frequencies are consistent with the idea that belonging to cooperative is an important factor that influences training while also enhancing livelihoods in terms of perceived livelihood improvements. The study only used descriptive statistics, a basic data analysis tool. This study employed it together with inferential statistics (regression analysis).

Again, a study by Bontis et al. (2018) assessed intellectual human capital and in Social Cooperative Enterprises (SCEs) financial performance in Italy. A questionnaire was created and distributed. The investigation included 151 SCEs as the ultimate sample. Two models that suggested a beneficial relationship between IC sub-components—namely, human capital, structural capital, and relational capital—and the financial performance of SCEs were tested. The results show that human capital helps to explain economic success, which is influenced favourably by the presence of graduate personnel. However, the amount of training each person receives annually has a detrimental impact on economic performance of the cooperatives. Notwithstanding, its relevance to the current study, it was conducted in Italy, a developed hence drawing inferences with respect to the local scenario is impractical. The study thus presented a localized study by investigating the effect of training on livelihoods on Kiambu County community farmers.

In Ethiopia, Amenu et al. (2020) studied milk symposium review: Community training to enhance knowledge and practices regarding milk production. A total of 120 women were studied. In the initial post-training examination, the participants' knowledge score rose from 75.6-91.4%, and six months after training, it reached 90.0%. They discovered significant variance in the total attitude score during the initial post-training evaluation in comparison to pretraining, but not six months later. Similar gains in knowledge of appropriate procedures were noted, rising from 49.5% before to instruction to 64.7% six months later. The percentage of women who reported adopting certain desirable attitudes and actions prior to training was low, and the training-induced shift

nevertheless left a third of the participants with a negative attitude and 25% with incorrect practices in dairy farming and this needed training.

Further, Hatew et al. (2023) examined management training and genetics on dairy milk production amongst Ethiopian smallholder farmers. The findings demonstrated a highly substantial treatment effect on the yield of milk, as well as an intervention by week connection, with the impact of the treatment progressively growing. The experiment's cows had different percentages of Holstein-Friesian genome, ranging from 0% to 100%, which suggests that uncontrolled crossbreeding is common hence the need for training. Additionally, cows receiving supplemental feed training had better body conditions, fewer services per conception, and longer lactation durations. The results indicate that, in addition to improving genetics, a comprehensive strategy that combines better feed, feeding techniques, and training will boost milk output, enhance milk quality and body condition, and lengthen lactation.

In Nigeria, Chigozi and Onyia (2018) investigated the effect of human capital development on performance of SACCOs in South-East Nigeria. Data was gathered using self-administered questionnaire. The study employed descriptive research design. Data was analysed using factor analysis. It was shown that a company cannot compete effectively in the dynamic business marketplaces without investing in learning and adopting ongoing improvement, learning, sharing, mobilisation, distribution, nurturing, and practising, reviewing, and spreading knowledge. This means that cooperatives are vital in shaping performance of cooperatives by exposing members to human capital development to improve their business skills and knowledge. The fact that the study only used factor analysis resulted to a methodological gap that was bridged by using descriptive statistics together with multiple regression analysis.

Moreover, Kiswili et al. (2019) assessed effect of human capital development on the performance of SACCOs-Kenya. A description explanation research approach was utilised. The target population included 84 SACCOs. 184 managers were chosen using purposive sampling. Data was gathered using a semi-structured questionnaire. Both descriptive and inferential statistics were used to aid data analysis. The analysis used the Pearson correlation and regression. It was discovered that the performance of SACCOs is significantly and positively impacted by human capital empowerment via training and development. It found that SACCOs positively impacted farmers knowledge, skills, and experience. However, used performance as dependent variable hence a conceptual research gap. This study therefore strove to fill the conceptual research by using livelihoods as dependent variable. This study thus investigated the effect of training on the livelihoods of local community farmers in Kiambu.

Mwebia (2020) analyzed determinants of performance among dairy cooperatives in Kiambu County. The target group had 74 individuals. Surveys were used to obtain data. The SPSS v23.0 was employed to analyse descriptive and inferential statistics. The results showed a strong relationship between management and training and cooperatives' performance. Additionally, it was discovered that training improved performance. In spite its relevance to the current stud, it nonetheless focused on performance' determinants among dairy cooperatives in Kiambu hence a conceptual research gap. Therefore, to bridge this gap this study focused on effect of dairy cooperative services on livelihoods of local community farmers in Kiambu County.

Furthermore, Kabuga (2024) investigated training, education, and dairy farmers' productivity. This investigation used a non-experimental design. Both qualitative and quantitative information was gathered. Respondents were given standardised questionnaires to complete. Responders sample was chosen using convenient and purposeful sampling that yielded a sample

size of 338. The data was analysed using quantitative description and regression methods. The results of the study demonstrated that agricultural training increased the productivity of farmers.

In addition, the county government and dairy farmers' cooperation's should prioritize training small scale dairy farmers to enhance their agricultural knowledge and competencies to increase milk production and optimally operate their dairy farms. On the other hand, the Ministry of Education should permit early specialization at the secondary level allowing secondary level students to specialize in crop farming or livestock farming, thus gaining intensive knowledge of agricultural practices such as dairying, which could result in higher milk productivity and better dairy farming practices. But there were no appreciable changes in milk production between learners who pursued farming and those that didn't. The preponderance with elementary and intermediate agricultural education levels was cited as the reason for absence of substantial variations in mean daily milk output between groups. This suggests that participants did not receive enough specialised training on agricultural methods. According to findings, productivity is positively impacted by training. To increase dairy productivity, the research advises dairy producers to pursue training tailored to their industry.

2.3.4 Dairy farmers' livelihoods

In India, Gaillard and Dervillé (2022) studied dairy farming, cooperatives, and livelihoods. his study investigates industry's inclusivity and effects of cooperative membership on farmers' income and standard of living by polling 244 farmers in two significant but diverse Indian states. The publication's methodical approach to assets and households' activities is what makes it unique. The findings show that membership and farmers' collection facilities are linked to cooperative participation. Membership is linked to higher earnings, especially for small-scale owners and farmers with smaller land who rely on dairy earnings to escape poverty.

In yet another research, according to Mojo et al. (2017), farmers' income was positively impacted by cooperative membership. The selection of cooperatives was favourably influenced by family's head's level of education, family size, amount of land, and distance to gathering centre. According to Dan et al. (2021), the income of members in China was adversely and considerably dependent on village terrain and family status. They proposed that family status decreased reliance on agriculture income by increasing off-farm revenue-generating endeavours. The mountainous topography made transportation more expensive, which decreased farmers' earnings. Earnings was not much impacted by labour input, farmland acreage, or loan availability. Twumasi et al. (2021) discovered that off-farm employment had a negative effect on farmers' income, which is in contrast to their results. Nevertheless, revenue disparity amongst active cooperative members versus those who have chosen to sell to alternative marketing channels was not taken into account in these earlier research.

In Zimbabwe, Mhembwe and Dube (2017) focused on cooperatives' role in sustaining livelihoods amongst rural folks. Their mixed technique method for investigation employed a descriptive survey methodology. Primary research tools used were a questionnaire, interviews, and observation techniques. Data was gathered from government representatives and six cooperative members using purposeful sampling technique. This investigation had fifty research subjects. Cooperatives were discovered to have been created as a means of maintaining rural communities' means of subsistence. Through use of cooperatives, rural residents were able to improve their standard of living and lower poverty by creating jobs, increasing food production, empowering marginalised groups, particularly women, and fostering cohesiveness and integration. Insufficient funding, ineffective management and an absence of managerial expertise, and a shortage of competitive markets for produce are only a few of difficulties that majority of

cooperatives encounter. This research suggests that in order to enable rural cooperatives expand and broaden their economic activities, government and in particular, banks should give monetary backing. Additionally, cooperative members should get ongoing training in management techniques. In order to market produce with greater convenience, cooperatives, particularly those working in agriculture, must establish some producer organisations.

In Ethiopia, Fereja (2025) evaluated dairy cooperatives influence on smallholder farmers livelihoods. The study used ttests to examine microbiological and physicochemical characteristics of raw milk, as well as descriptive statistics and matching propensity scores to evaluate outcomes like milk yield, price for sale, revenue from household, consumption, and employment, using data from 205 dairy farmers (156 cooperative members and 49 non-members). Because members have better access to crossbred cows, veterinary care, inputs, and market knowledge, findings showed that cooperative participation considerably increases milk production and income for families. Cooperative members profit from steady costing, regular access to markets, and dividend profits, which lead to larger overall financial gains, while non-members obtain somewhat higher costs via direct sales. Because of larger herd sizes, membership is also associated with more job prospects. Informal markets, erratic demand, and quality issues are major obstacles for cooperatives; however, urbanisation, demographic changes, government assistance, and closeness to dairy industry present expansion potential. Significant disparities in quality between groups were found in laboratory evaluation of 45 sample milks (30 from members and 15 from non-members). In comparison to members, nonmember milk samples had reduced particular gravity readings (1.024-1.023). Additionally, the mean total solids (TS) and fat content of the milk sample from members were considerably ($P < 0.01$) greater. In general, the investigation found that association members

and non-members had significantly different milk quality, which led to suggestions for better milk handling procedures.

In Zambia, Cheng et al. (2025) examined smallholder dairy farmers participation in cooperatives. 515 smallholder dairy farmers in rural areas provided the data. A random forest model and a random effects logit model are used in the research to determine the variables affecting farmers' choices regarding joining dairy cooperatives. Three main conclusions were noted. First, RF model outperformed random effects model in terms of prediction accuracy, which is consistent with previous research on the improved predictive power of machine learning methods. Furthermore, random effects logit model revealed that current farmers' decisions to become members of dairy cooperatives were highly influenced by a number of important criteria, such as location close to cooperative facilities, level of education, and farming experience. Third, according to random forest model, most important indicators of cooperative membership for subsequent scenarios are anticipated to be demographic and economic factors, namely age of the household head, size of household, total livestock ownership, dependability ratio, and farming experience.

Onyango et al. (2023) investigated cooperatives impact on smallholder dairy farmers' income. The purpose of the investigation was to evaluate how smallholder dairy farmers' incomes were affected by their choice of cooperatives. A semi-structured questionnaire was used to gather information from a sample of 277 farmers in Nyamira and Homa Bay Counties. The data was analysed using endogenous switching regression model. According to the findings, farmers' revenues rose by almost 10% when they participated in cooperative markets. The findings also showed that number of lactation cows, farm size, farmer location, milk payment period, and market distance all had an impact on farmers' decisions to join the cooperatives. Additionally, the

number of breastfeeding cows, farm size, ability to access off-farm income, education level, and availability of extension services were important factors in affecting farmers' income. This study makes policy recommendations to boost Kenyan smallholder dairy producers' involvement in cooperative markets.

Kiarie (2025) investigated factors influencing Small Dairy Farmers' (SDFs') access to credit in Nyandarua County. The two main goals of the study were (i) to assess how credit availability affected SDFs' production and (ii) to investigate the variables influencing SDFs' ability to obtain credit. 400 SDFs were chosen using stratification and simple random sampling, and both primary and secondary information were examined. Data was gathered using structured questionnaires, and analysis was done using linear regression, logistic regression, and descriptive statistics. According to results, farmers who had access to financing produced 2.09 litres additional milk per cow every day than those who did not. Yet, 72% of farmers had financial difficulties, and just 28% had the ability to obtain finance. Even though 84.97 percent of them made their living from dairy farming, 77 percent made less than KES 15,000 per month, and 70 percent had operating expenses between KES 1,000-KES 20,000, indicating problems with profitability. Only 12% of farmers loaned from commercial banks, demonstrating restricted availability of formal financial institutions, whereas 72% of loans came from SACCOs. Access to loans was hampered by higher interest rates (56 %), collateral requirements (87 %), and trouble finding guarantors. Furthermore, 66% of farmers had never seen a veterinarian, indicating deficiencies in extension services. According to regression analysis, size of farm, farming expertise, and veterinarian visits had little effect on milk yield, whereas feed quality had most impact ($\beta = 0.255$), subsequent to loan availability. The research project came to the conclusion that dairy productivity was hampered

by restricted loan availability. It was discovered that removing financial obstacles was essential to raising SDF effectiveness and efficiency.

2.4 Research Gaps

The study reviewed various empirical studies using a funnel approach. These included global, Africa, and localized studies. The studies were then summarized in a table format to showcase research gaps. Table 1 shows the identified research gaps and how they are to be bridged.

TABLE 1

Research Gaps

Author	Title	Country	Methodology	Findings	Gaps	How to fill gaps
Jayase na et al. (2019)	Livelihood analysis on smallholder participation in milk markets in Sri Lanka.	Sri Lanka.	In Gonapinuwala, Southern Sri Lanka, 28 smallholder farmers serve as the case study for this research. Three types of smallholders were established through data analysis, which was based on differences in milk selling, production practices, and livelihood portfolios.	Results showed the significanc e of supporting dairy farmers to access markets to improve livelihood	However, the study was done in a developed country that has a variation in context hence a contextual research gap that calls for the current study	This study bridged the gap by assessing the effect of credit access on livelihood s among dairy farmers with a specific focus on Kiambu County.
Mundi a et al. (2023)	Investigated how agriculture cooperatives helped rural populations in Zambia's	Zambia	The study used 229 closed- ended questions as data collecting instruments in conjunction with	The results showed that having access to credit for	The context of this study varies from the ones witnessed	Therefore, this study bridged the gap by assessing the effect of credit

Author	Title	Country	Methodology	Findings	Gaps	How to fill gaps
	Kabwe district improve their standard of living		a case study methodology. Regression analysis and descriptive statistics were employed in the investigation.	farmers raised household income, which in turn contributed to higher household income. Furthermore, in a binary logistic regression model, social capital and cooperative training had no effect on the rise of cooperative members' income levels although the dependent variable—household income growth—was significant at 1%	in Kiambu County hence the need for the current study.	accessibility on livelihoods amongst dairy farmers of Kiambu County.
Ouma et al. (2020)	The opportunities and constraints to smallholder dairy market	Burundi	Five communes from three sample provinces in the target PRODEMA areas in Burundi	The study found that, the main point of contact between dairy	Nevertheless, the study was done in Burundi, a country with	The current study thus assessed the influence of market

Author	Title	Country	Methodology	Findings	Gaps	How to fill gaps
	development in Burundi		were the location. Focus groups, key informant interviews, and a wrap-up workshops with members of these groups comprised the discussion formats	farmers and milk dealers (collectors) in milk producing areas is the marketing of milk products across the three regions	varied geographical scope hence the call for the current study	access on the livelihood of Kiambu farmers
Waliaula (2017)	Assessed Agrarian co-operatives' effect on social-economic development in Sirisia constituency	Kenya	The methodology used was a descriptive survey. Data gathered was qualitative and quantitative in nature. 534 cooperative individuals were its target. 107 participants were chosen at random employing stratified sampling procedures	The results showed that the contemporary cooperatives have relatively minimal positive influence on the quality of life for the people living in the neighbourhood. It found that cooperatives had a strong positive relationship with livelihood	Despite that the study was done in Kenya, it only relied on information from Sirisia thus excluding Kiambu that is the bedrock of Dairy farmers	To bridge the gap, the study focused on all dairy farmers in Kiambu County to determine how they have enhanced livelihood for local community farmers

Author	Title	Country	Methodology	Findings	Gaps	How to fill gaps
				because it empowered their economic development		
Kustepeli et al. (2023)	Examined the effects of cooperatives on the development of human capital and bettering of living conditions in eight villages in Turkey's Aegean area	Turkey	Semi-structured in person questionnaires were used to gather data. Data was analysed using descriptive statistics	The findings via frequencies are consistent with the idea that belonging to cooperative is an important factor that influences human capital empowerment while also enhancing livelihoods in terms of perceived livelihood improvements	The study only used descriptive statistics that it a basic data analysis tool	This study used descriptive statistics together with regression analysis.
Chigozi and Onyia (2018)	Investigated the effect of human capital development on performance of SACCOs in South-East Nigeria	Nigeria	Data was gathered using self-administered questionnaire. The study employed descriptive research design. Data was	It was shown that a company cannot compete effectively in the dynamic business marketplace	The fact that the study only used factor analysis resulted to a methodological gap	The methodological gap was bridged using descriptive statistics together with

Author	Title	Country	Methodology	Findings	Gaps	How to fill gaps
			analysed using factor analysis.	ces without investing in learning and adopting ongoing improvement, learning, sharing, mobilisation, distribution, nurturing, and practicing, reviewing, and spreading knowledge		multiple regression
Mwebi a (2020).	Analyzed determinants of performance among dairy cooperatives in Kiambu County	Kenya	The target group had 74 individuals. Surveys were used to obtain data. The SPSS v23.0 was employed to analyse descriptive and inferential statistics	The results showed a strong relationship between management and training and cooperatives' performance. Additionally, it was discovered that training improved performance	In spite its relevance to the current study, it nonetheless focused on performance' determinants among dairy cooperatives in Kiambu hence a conceptual research gap	Therefore, to bridge this gap this study focused on effect of dairy cooperative services on livelihoods of local community farmers.

2.5 Conceptual Framework

The dependent variable was dairy cooperative services. It was measured using market access, credit access, and training. Further, market access for dairy products was operationalized using distant to market, means of transport and costs. Credit access was operationalized using availability of credit and use of collaterals to access credit. Meanwhile, training was operationalized using improved skills, knowledge, workshops, and experience. The dependent variable was livelihoods of community farmers that were measured using community/individual wellbeing and ability to afford basic needs.

Independent variables

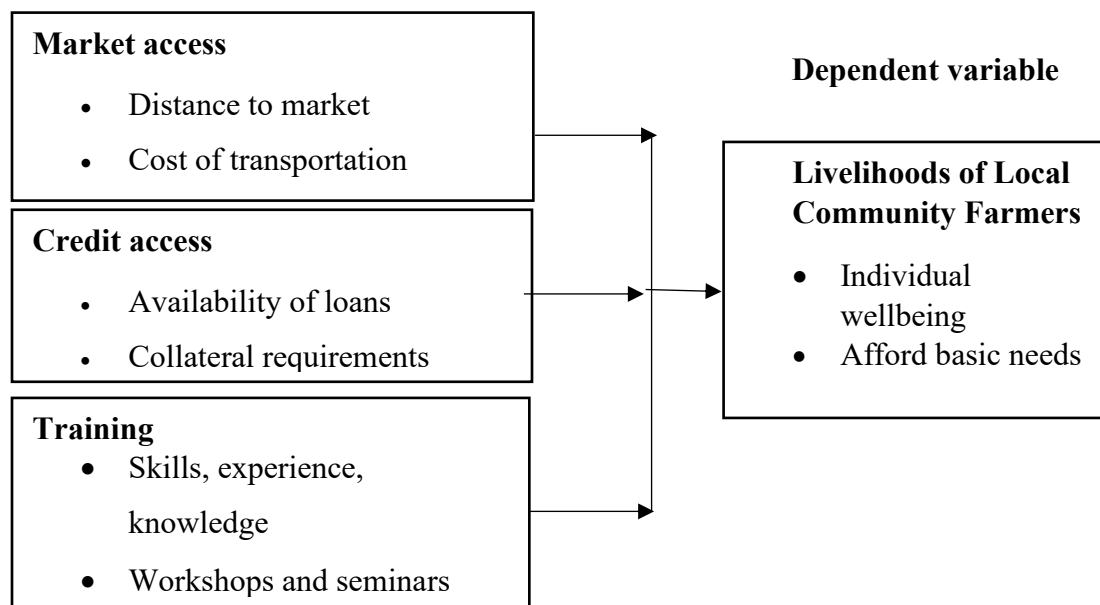


FIGURE 1

Conceptual Framework

2.5.1 Operationalization of variables

In this subsection, the research presents the operationalization of both independent and dependent variables. The variables' operationalization is presented as illustrated in table 2.

TABLE 2**Operationalization of Variables**

Variables	Type	Definition	Indicators	Measurement scale	Data Collection Method
Market access	Independent variable	Ability of a business to sell its products and services beyond its location	▪ Distance to market ▪ Cost of transportation	Ordinal	Questionnaire
Credit access	Independent variable	Ability to access financing facilities with the understanding that receiver will either repay the first party at a later date with interest	▪ Availability of loans ▪ Collateral requirements	Ordinal	Questionnaire
Training	Independent variable	The process of imparting knowledge, skills, and expertise related to certain practical competencies to an individual	▪ Improved skills/experience/knowledge ▪ Workshops and seminars	Ordinal	Questionnaire
Livelihoods of local community farmers	Dependent variable	An individual's social and economic daily lifestyle	▪ Community / individual wellbeing ▪ Ability to afford basic needs (medication, food, shelter)	Ordinal	Questionnaire

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The chapter presented research methodology that included design, populations together with sampling technique. Additionally, data gathering tools, data gathering procedure, piloting, and data analysis together with ethical consideration were included.

3.1 Research Design

Research design in the words of Bloomfield and Fisher (2019) is a commonality that connects every component of a research endeavour. The study employed a descriptive survey design that resonates with quantitatively collected data (Siedlecki, 2020). The research promoted the application of descriptive research since it enables researchers to investigate and characterise the pattern of distribution of many variables employing a methodology akin to the one used in the present investigation. Since it assisted in providing answers to questions regarding the present situation, the research design was appropriate for this investigation. Moreover, it was appropriate for the current research since it allowed for the collection of substantial volumes of data, which enabled the investigator to extrapolate the findings to a large population. The design chosen by the current research has been successfully used in studies by Mwebia (2020), Chigozi and Onyia (2018) and also Waliaula (2017).

3.2 Target Population

Target population is a group of people for whomever the study is meant to gather data (Stratton, 2021). The research was conducted among all active and registered dairy cooperatives in Kiambu County. The county has a total of 314 active and registered cooperatives but only 20 of them are dairy cooperatives. The study focused on all local community farmers who

are affiliated to the 20 dairy cooperatives totaling 73,319 based on Kiambu County Cooperative Department Records (2025). The 73,319 farmers formed the target population (unit of analysis) while cooperatives were the unit of observation.

3.2.1 Sample size and sampling technique

A sample size is the fraction of a population that is used to collect information. To reflect the population as a whole, a smaller proportion of the target population that is accessible is chosen (Bhardwaj, 2019). The research utilized scientific formula by Yamane (1967) to determine an appropriate sample size. The scientific formula was used because the population was huge hence the need for a manageable and accommodative sample size.

Yamane formula: $n = N/(1 + Ne^2)$

n = Sample

N = Population

e = Error (0.05)

Sample size: $n = N/(1 + Ne^2)$

$$n = 73,319/(1 + 73,319 \times 0.05^2)$$

$$n = 397.8296$$

$$n \approx 398 \text{ Farmers}$$

Choosing a small sample of individuals to serve as the population as a whole is known as sampling (Stratton, 2021). The research used simple random sampling to select a sample of 398 local community farmers in co-operatives (Table 3). Simple random sampling was used because it is unbiased and showed that every responder had a similar probability of partaking in the research.

TABLE 3**Sample Size**

Sub-counties	Target population	Sample size	Sampling technique
Limuru	9,875	54	Simple random sampling method
Kikuyu	5,342	29	
Kabete	4,788	26	
Lari	2,212	12	
Gatundu South	3,667	20	
Gatundu North	4,908	27	
Githunguri	22,644	123	
Kiambu town	5,321	29	
Kiambaa	3,968	22	
Ruiru	2,465	13	
Juja	2,697	15	
Thika Town	5,432	30	
Total	73,319	398	

3.3 Data Collection Instruments

A questionnaire survey was used in the research. The questionnaire was closed-ended and had six sections. Demographic data was included in the first section. Questions regarding particular study objectives were found in the remaining sections. Questionnaire used a five-point Likert scale, ranging from 1-5. One implied strongly disagree, two meant disagree, three denoted not sure, four implied agree, and five meant strongly agree.

3.4 Pilot Test

A pilot investigation is a very small experimental investigation intended to test logistics and collect data before a more comprehensive investigation (Williamson, 2004). Under the pilot experiment, a questionnaire sample with features akin to the real sample was employed. A pilot study was done in Muranga County, a different location but with similar characteristics. According

to Mugenda and Mugenda (2003), effective pilot research uses 1% to 10% while taking sample size into account, for a big sample. Therefore, 39 members of dairy cooperatives from Muranga County were used as the pilot. The 39 represents 10% of the entire sample size (398). To access the pilot sample, a list of farmers was requested from the dairy SACCOs management. The researcher then distributed questionnaires randomly to 39 members. Pilot test was employed to detect any possible problems, such as imprecise instruments, inadequate phrasing, and improper terminology in data collection equipment. Emphasizing unclear questions which respondents have understood differently was beneficial. Due to the fact that the instrument was consistently reliable, no necessary adjustments were made.

3.4.1 Validity of research instruments

The degree to which variations detected by a measuring tool represent actual variations amongst the subjects under investigation is referred to as validity (Kothari, 2008). The content and validity of constructs were tested by the investigator. The extent whereby the test's content aligns with the subject domain linked to the construct serves as proof of content validity. Research experts often assess the questions in relation to the test specifications when providing evidence that is content based. Content validity can be improved by having research experts assess the test parameters and item choice. The author enlisted the aid of KCA University supervisors as well as advice from fellow learners. The researcher took their feedback into consideration to increase the instrument's validity. The instrument was guaranteed to capture the essential components of the variables, such as market access, credit access, training, and livelihood by both content and construct validity.

3.4.2 Reliability of research instruments

Reliability testing was done as part of research. The capacity of a tool for study to produce consistent outcomes or responses following multiple administrations is known as reliability. A reliability test was conducted among Cooperatives within Muranga County. Cronbach's alpha coefficient was utilised to assess the questionnaire's reliability before participants were given the study instruments. To determine the degree to how the survey questions consistently generate identical replies when employed, Cronbach's alpha equation was utilised to determine the coefficient based on the replies received. When the Alpha coefficient is closer to 1.0, it indicates that the instruments employed are trustworthy and can be utilised for collecting information. The reliability results for market access, credit access, training, and livelihoods were 0.781, 0.792, 0.811, and 0.766, respectively.

3.5 Data Collection Procedure

The act of gathering data to back up an argument is known as data collecting (Beckett, Eriksson, Johansson, & Wikström, 2018). Before data collection, an introductory letter from the university authorizing collecting data was received as part of research ethics. The National Commission for Sciences, Technology, and Innovation (NACOSTI) researcher permit application was processed using the data gathering authorization document. By the help of a research assistant, the researcher delivered questionnaire to local community farmers who were affiliated to various co-operatives across all sub-counties. The survey was self-administered using the “drop and later pick” approach, which allowed respondents ample time to consider their answers thoughtfully and without interruption.

3.6 Data Analysis

Data analysis entailed cleaning, coding, entry, and computation (Diamantopoulos, Schlegelmilch, & Halkias (2023). Data was processed using Statistical Packages for Social Sciences (SPSS) version 31. Both inferential and descriptive statistics were useful in data analysis. Throughout the investigation, descriptive statistics that consider frequencies, percentages, tables, figures, and averages were employed.

The study also used Pearson correlation (r). Correlation was used to determine direct or causal relationship amongst variables. The range of values for the correlation coefficient (r) is -1 to +1. A score of "0" indicates that there is no positive correlation between the two predictors. The ideal positive correlation between the variables is indicated by a value of +1, which means that when the value of one variable increases, the values of the other variables also increase. Armstrong (2019) defines a negative connection as one whereby the figures of the two variables fall when one rises, as shown by a value of -1. One table format will be used to display the findings.

The study also utilized linear regression analysis. The method helped in establishing the relationship between predictor and dependent variable. Regression was presented into model summary, ANOVA, and coefficients. The results were presented into tables.

3.6.1 Empirical model

The research employed multiple regression model. The multiple regression model as suggested by Fahrmeir, Kneib, Lang, and Marx (2022), aids in overall inquiry regarding the most effective predictor variable.

$$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e_i$$

Where:

Y - Livelihoods of Local Community Farmers

α_0 -Is the constant.

X1-Market Access

X2- Credit Access

X3-Training

$\beta_1, \beta_2, \& \beta_3$ -Coefficients

e_i -Is the residual error term

3.7 Diagnostic Tests

To assess regression model's assumptions, the study employed a number of diagnostic tests. These tests comprise of multicollinearity, heteroscedasticity, and normalcy.

3.7.1 Normality

To ascertain if the data is normally distributed, the normality test will be used. It facilitates the attainment of data reliability and practical accuracy (Mishra et al., 2019). The Q-Q plot test was used to determine whether the data was normally distributed. The threshold for Q-Q plot is that dots must form pattern along the diagonal line to approve normal distribution.

3.7.2 Multicollinearity

This test aids in preventing bias in the data collected (Shrestha, 2020). Additionally, it aids in making sure that one variable's data is independent to another. When more than one variable (independent) has an exact or almost exact linear relationship with another, multicollinearity occurs. Thus, multicollinearity was tested using the variance of inflation (VIF). As a result, multicollinearity was present if the VIF is less than 1 or larger than 10. On the other hand, VIF readings ranging between 1 and 10 showed no multicollinearity.

3.7.3 Heteroscedasticity

Regression predictions are wasteful when heteroscedasticity is present, and this has to be fixed (Đalić et al., 2021). Plotting standardized residuals versus the fitted values should show no trend if the model is well-fitted. Whenever the criterion of a constant variance is broken, heteroscedasticity is established. Specifically, homoscedasticity (same scatter) is state in which variance remains constant throughout a range of data. It is known as varied scatter (heteroscedasticity) when the variance varies. The Breusch–Pagan test, which determines if heteroskedasticity existed was used. This was tested using residuals.

3.8 Ethical Consideration

According to Randall and Diener (1978), ethics is a perspective and a method for determining how to face challenging circumstances. The researcher requested KCA's approval for the data gathering activity to comply with research ethics. Additionally, the researcher applied for a NACOSTI data collecting permit. The organisation gave approval to ensure research was conducted. The anticipated respondents were informed by the investigator of the study' purpose, and they were assured that their answers, personal identities, and involvement status would all remain anonymous. Furthermore, the investigator ensured that participants did it voluntarily. Prior to the distribution of survey, respondents gave required authorization through consent form. Regarding anonymity, no participant, whatsoever, was required to mention their personal details during the exercise to maintain confidentiality. Concerning dissemination of the report, only interested farmers and cooperatives will be provided with both soft and hard copies upon request. Finally, but importantly, literary works that previous scholars and academics have cited were appropriately recognised with the appropriate references and citations.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

In this chapter, the research presented results from field data. Specifically, the section entailed response rates, respondents' demographic results, and subsequently, descriptive results based on research objectives. The study also presented diagnostic test scores alongside correlation findings. The final subsection had regression results.

4.2 Response Rate

The study distributed questionnaires to 398 respondents. Out of 398, 248 respondents returned complete questionnaires thereby resulting in 62.31%. This was deemed sufficient for data analysis as supported by Mugenda and Mugenda (2006) who opined that a 50% response rate is adequate for data analysis.

4.3 Demographic Information

In this subsection, the respondents' personal information including highest education level and duration as a dairy farmer were sought. The results are presented in the subsequent subsections.

4.3.1 Highest education level

Respondents were required to indicate their distribution by educational level. The results are captured in Figure 2.

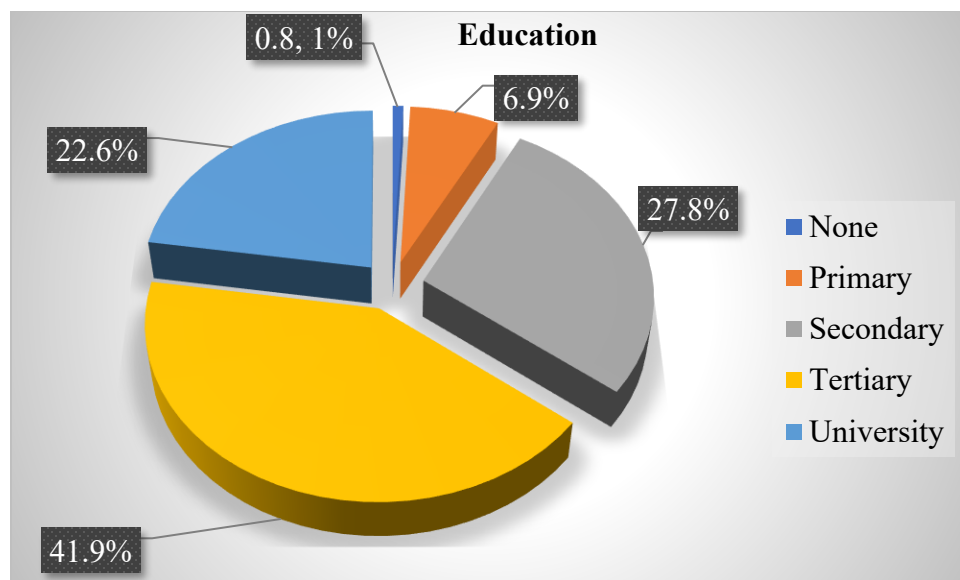


FIGURE 2

Education Level

In figure 2, 41.9% of the respondents reported that they had tertiary/college as their highest educational level. Meanwhile, 27.8% indicated that they had attained secondary education as their highest education level whilst 22.6% had university educational levels. From the findings, it can be said that dairy farmers in Kiambu County are fairly educated hence with proper training in dairy farming, their livelihoods would equally improve.

4.3.2 Duration

Respondents were asked to provide information on duration they have been involved in dairy farming. Figure 3 shows result acquired from the field.

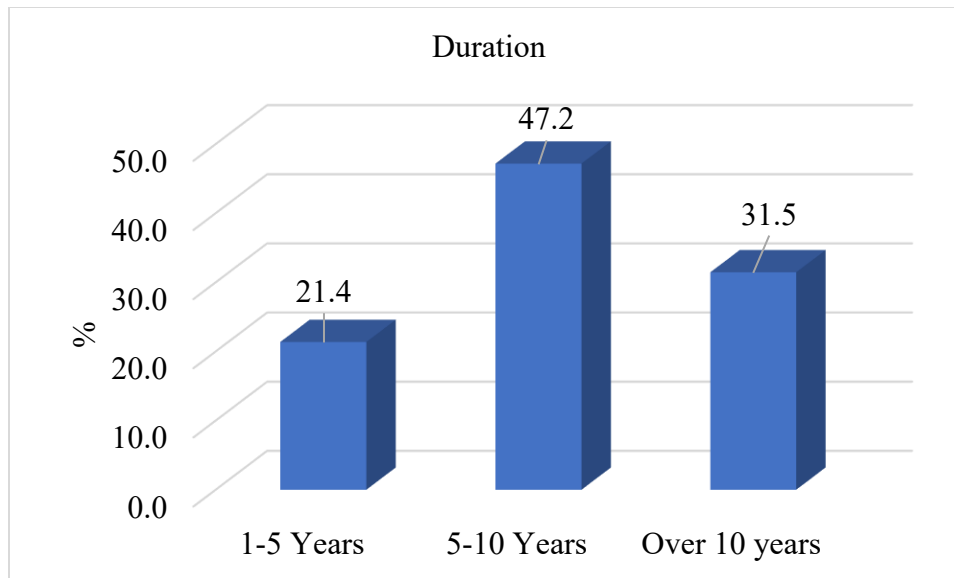


FIGURE 3

Duration

The results indicate that most farmers had a duration of 5-10 years as reported by 47.2% whilst 31.5% had a period of 10+ years. A further 21.4% said that they had a dairy farming duration of 1-5 years. From the findings, it can be reported that majority of farmers had garnered adequate experience in dairy farming related activities hence this could have a positive impact on their livelihood.

4.4 Descriptive Statistics

Under this subsection, descriptive statistics' results are presented. In particular, the results were presented in line with specific objective. The following subsections captures detailed findings.

4.4.1 Effect of market access on livelihoods of local community farmers

In order to establish the effect of market access on livelihoods of local community farmers in Kiambu County, responses on various items were sought on a Likert scale of 1-5 1= Strongly

Disagree (SD), 2= Disagree (D), 3= Not Sure (NS), 4= Agree (A), 5= Strongly Agree (SA). Table 4 show results.

TABLE 4
Effect of Market Access on Livelihoods of Local Community Farmers

	SD (%)	D (%)	NS (%)	A (%)	SA (%)	Mean	Std. Dev
The markets for selling dairy products are distantly located hence affecting timely deliveries	2.4	5.6	0.0	66.9	25.0	4.06	0.832
Due to stiff competition from other farmers within the county, we sometimes sell cheaply	1.2	1.6	0.0	45.6	51.6	4.45	0.701
The cost of transportation makes it harder for many farmers to realize good income	0.8	3.2	0.0	41.9	54.0	4.45	0.735
Poor road networks in remote areas have hugely contributed to untimely delivery of our dairy products	0.4	0.8	0.0	36.3	62.5	4.60	0.582
Stringent health related standards inhibit our ability to scale up milk sales to distantly located markets	0.8	1.6	0.0	71.8	25.8	4.20	0.597

As presented in table 4, respondents predominantly agreed that markets for selling dairy products are distantly located hence affecting timely deliveries as supported by a mean score of 4.06 with a small variability of 0.832. In agreement, Jayasena et al. (2019) found that how farmers conducted their commercial dairying in markets determined their access to various buyers. Specifically, results showed the significance of supporting dairy farmers to access markets to improve livelihood. It was again revealed that respondents widely agreed that due to stiff competition from other farmers within the county, they sometimes sell dairy products cheaply as reported by a mean score of 4.45 with a small Std. Dev of 0.701. Again, it was established that most respondents agreed that the cost of transportation makes it harder for many farmers to realize good income as indicated by a mean of 4.45 alongside a Std. Dev of 0.735. In concurrence, Migose

et al. (2018) discovered that milk was comparatively less costly in informal market chains in the rural areas and this was attributed to too much milk production by farmers. Ouma et al. (2020) found that, the main point of contact between dairy farmers and milk collectors is marketing of milk products, however, transportation was somehow concerning to some farmers. Further, poor road networks in remotest areas were found to have hugely contributed to untimely delivery of dairy products as indicated by a mean of 4.60 with a variability of 0.582. In yet another study, Migose et al. (2018) discovered that timely transit of dairy products from rural areas was impacted by distantly located markets, which in turn hampered the lives of small dairy producers. Again, Wangu et al. (2021) equally revealed that distance to market influenced access to customers and this lowered income generated from dairy products. The study established that stringent health related standards inhibit farmers' ability to scale up milk sales to distantly located markets as reported by a mean of 4.20 with a smaller variation of 0.597. Mengistu and Meressa (2023) established that farmers were more likely to select cooperative market outlets when they have access to knowledge to health rules and market information.

4.4.2 Effect of credit access on livelihoods of local community farmers

To determine effect of credit access on livelihoods of local community farmers, responses on various items were sought. Table 5 show results.

TABLE 5**Effect of Credit Access on Livelihoods of Local Community Farmers**

	SD (%)	D (%)	NS (%)	A (%)	SA (%)	Mean	Std. Dev
I am able to access loans in real time to boost my dairy farming related activities	0.4	1.6	0.0	38.3	59.7	4.55	0.628
The cooperatives provide loans to eligible members with no collateral requirements	0.0	0.0	0.0	33.1	66.9	4.67	0.471
Availability of credit offered by cooperatives make it easy for me to apply and access loans within shorter time	0.0	0.0	0.0	25.0	75.0	4.75	0.434
The credit repayment duration is friendly to dairy farmers within Kiambu County	0.0	0.0	0.0	75.0	25.0	4.25	0.434
The interest charged on loans can be said to be friendly to majority of us	1.6	2.4	0.0	71.4	24.6	4.15	0.684
My cooperative offers adequate grace period before starting to service credit provided	0.4	0.8	0.0	30.2	68.5	4.66	0.569

In table 5, it established that farmers were able to access loans in real time to boost their dairy farming related activities as agreed most respondents with a mean score of 4.55 and Std. Dev of 0.628. In congruence, Karanja and Kibiego (2020) argued that cooperative services include savings accounts and credit accessibility that promotes farming activities. Specifically, farmers can obtain the required financial resources to allocate towards their dairy enterprises, procure vital resources to enhance scale of their activities. The research also found that the cooperatives provided loans to eligible members with no collateral requirements as supported by a mean of 4.67 alongside a small variation of 0.471. However, the work of Purwanti et al. (2023) showed that a

number of factors, such as collaterals, cattle ownership, and family members' work had a substantial impact on farmers' decisions to use loans. These characteristics' beneficial effects highlight the significance of focused initiatives to improve farmers' access to financing. Concerning whether availability of credit offered by cooperatives made it easy for farmers to apply and access loans within shorter time, respondents predominantly agreed with the statement as revealed by a mean of 4.75 and Std. Dev of 0.434. The results resonate with research by Uddin et al. (2022) revealed nearly every farmer appreciated that low fee-based credit service was profitable and production has increased thanks to the credit facility and the farmer-to-market connection that has become stronger thereby maximising revenue. The credit repayment duration was found to be friendly to dairy farmers as reported by a mean of 4.25 alongside a Std. Dev of 0.434. based on these results, Solomon (2022) discovered that financial support in the form of microcredit with accommodative repayment terms had a significant and positive impact on the members' income, consumptions, health care, fee payment, job generations, and dwellings condition. It was also found that the interest charged on loans was friendly to majority of farmers as indicated as indicated by a mean of 4.15 with a small variability of 0.684. Raniga (2021) found that creating social economic capital such as offering friendly credit facilities to women to boost the growth of their businesses alongside bearable payment periods improved farming related activities. Lastly, it found that cooperatives offered adequate grace period before starting to service credit provided as reported by a mean score of 4.66 with a variability of 0.569. The results concur with the work of Mundia et al. (2023) that showed that having access to affordable credit for farmers raised household income which in turn contributed to higher household income and improved livelihoods.

4.4.3 Effect of training on livelihoods of local community farmers

To find out effect of training on livelihoods of local community farmers, several items were presented and results are shown in Table 6.

TABLE 6
Effect of Training on Livelihoods of Local Community Farmers

	SD (%)	D (%)	NS (%)	A (%)	SA (%)	Mean	Std. Dev
My cooperative regularly offers basic education on business management techniques to us	0.0	0.0	0.0	13.3	86.7	4.87	0.340
The training received from my cooperative has enabled me to generate more income	0.0	0.0	0.0	7.3	92.7	4.93	0.260
My skills on dairy farming management have been improved thanks to ongoing training by my cooperative	0.0	0.0	0.0	12.5	87.5	4.88	0.331
My business development knowledge has enhanced, and this is attributable to financial management education received from my cooperative	0.0	0.0	0.0	87.5	12.5	4.13	0.331
My cooperative offers free training sessions hence most members have acquired adequate knowledge in running their dairy activities	0.0	0.0	0.0	24.6	75.4	4.75	0.432
My cooperative regularly organizes workshops and seminars for members	0.0	0.0	0.0	15.3	84.7	4.85	0.361

Table 6 shows that cooperatives regularly offered basic education on business management techniques as indicated by most respondents who agreed with a mean of 4.87 and Std. Dev of 0.340. Moreover, most respondents strongly agreed that training received from various cooperatives enabled farmers to generate more income as supported by a mean of 4.93 (Std. Dev=0.260). However, Amenu et al. (2020) discovered significant variance in the total attitude

score during the initial post-training evaluation in comparison to pretraining. Specifically, percentage of women who reported adopting certain desirable attitudes and actions prior to training was low, and the training-induced shift nevertheless left a third of the participants with a negative attitude and 25% with incorrect practices in dairy farming and this needed further training. It was again revealed that farmers' skills on dairy farming management have been improved thanks to ongoing training by various cooperatives and this is supported by a mean of 4.88 and small Std. Dev of 0.331. Kustepeli et al. (2023) findings are consistent with the idea that belonging to cooperative is an important factor that influences training while also enhancing livelihoods in terms of perceived livelihood improvements. Furthermore, it revealed that business development knowledge amongst farmers has enhanced courtesy of financial management education received as indicated by a mean of 4.13 and Std. Dev =0.331. Hatew et al. (2023) indicated that, in addition to improving genetics through knowledge acquisition via training, a comprehensive strategy that combines better feed, feeding techniques will boost milk optimum output thereby enhancing milk quality. On whether cooperative offered free training sessions to enable farmers acquire adequate knowledge in running their dairy activities, most respondents were agreement as attributed to a mean score of 4.75 with a variability of 0.432. Bontis et al. (2018) showed human capital helps to explain economic success, which is influenced favourably by the presence of graduate personnel who were fairly educated. However, the amount of training each person received has no impact on economic performance of the cooperatives. This means that training had detrimental effect on cooperatives' dairy farming. It was finally found that various cooperative regularly organizes workshops and seminars for members as shown by a mean score of 4.85. In yet another research, Chigozi and Onyia (2018) found that farmers must invest in learning and adopting ongoing improvement, knowledge sharing, mobilisation, and distribution of dairy products. This means

that cooperatives are vital in shaping farmer knowledge by exposing members to human capital development to improve their business skills and knowledge.

4.4.4 Livelihoods of local community farmers

In reference to livelihoods of local community farmers, various statements were analysed and presented. Results are illustrated in Table 7.

TABLE 7
Livelihoods of Local Community Farmers

	SD (%)	D (%)	NS (%)	A (%)	SA (%)	Mean	Std. Dev
My family's wellbeing has improved thanks to dairy cooperatives	0.0	0.0	0.0	16.9	83.1	4.83	0.376
I am able to afford food courtesy of dairy cooperatives that supports the development of my dairy business	0.0	0.0	0.0	4.8	95.2	4.95	0.215
I am able to educate my children thanks to continuous financial and business management support from dairy cooperatives within the county	0.0	0.0	0.0	20.6	79.4	4.79	0.405
My income level has risen due to my membership with various cooperative societies that supports the growth of my dairy activities	0.0	0.0	0.0	6.0	94.0	4.94	0.239
I am able to open savings account as a result of business development support from my cooperative society	0.0	0.0	0.0	94.0	6.0	4.06	0.239

In table 7, this research revealed that most respondents agreed with a mean of 4.83 (Std. Dev=0.376) that family's wellbeing has improved thanks to dairy cooperatives. In reference to whether farmers were able to afford food courtesy of dairy cooperatives that supports the development of dairy business, most participants strongly agreed with the statement as supported

by a mean of 4.95 and Std. Dev of 0.215. In agreement, Solomon (2022) discovered that credit support in the form of microcredit had positive impact on members' income, consumptions, health care, fee payment, job generations, and dwellings condition. It was also established that farmers were able to educate their children thanks to continuous financial and business management support from dairy cooperatives as evidenced by a mean of 4.79 and Std. Dev of 0.405. Regarding whether farmers' income level has risen due to membership with various cooperative societies that supports the growth of dairy activities, most respondents strongly agreed as indicated by a mean score of 4.94 and a Std. Dev of 0.239. Lastly, it was indicated that farmers were able to open savings account as a result of business development support from cooperative societies as agreed by most respondents who had a mean of 4.06 and Std. Dev=0.239.

Further, the research sought to establish via open-ended question how farmers' membership with cooperatives influenced their livelihoods. The results showed that affiliating with cooperatives help in combining milk from numerous smallholder farmers, giving them more negotiating leverage when selling in bulk to manufacturers or brands as opposed to selling separately.

Further, it was established that due to quality control and pooled supply, cooperative membership frequently gives access to more reliable buyers and occasionally lower pricing. Projects such as Dairy Hub at Githunguri (via technical training and public-private partnerships) have demonstrated improvements in milk collection, revenue generation, and milk yield per cattle. This results in increased income.

Again, it was revealed that via cooperatives, members can keep a greater portion of what they produce since cooling and storage infrastructure reduces losses (like spoiling). One example

of such is the government's funding of milk coolers through Dairy Value Chain Support Programme (DVCSP).

Moreover, the study established that cooperative participation/affiliation frequently entitle individuals to extension services and training (in disease prevention, breed development, livestock husbandry), which boosts output. In fact, to cut expenses, cooperatives have implemented technologies such as sexed semen and also make more efficient use of cow manure (for biogas or fertiliser).

It was again found that shared amenities (such as milk coolers and collection centres), marketing, and transportation courtesy of cooperative membership lower individual expenses for members. It was also noted that affiliating with various cooperatives increased production and steady income thus enabling families to pay for necessities, make investments in health care, education, and other areas.

Cooperative membership also increased household income and stability by improving milk sales and reducing spoilage thus enabling investments in dairy including better breeds, better feed, better cattle health that otherwise would be hard for individual farmers.

The dairy cooperatives were also valuable to farmers since they provided some risk mitigation like sharing burdens, access to collective inputs or services. Cooperatives also helped farmers by improving access to information, training, and sometimes credit/financing opportunities.

4.5 Diagnostic Tests

To test regression's assumptions, various tests were carried out. These included normality and multicollinearity.

4.5.1 Normality

The study used Q-Q plot to test for normality. The results are captured in the subsequent figures. As presented in figures 4, 5,6, and 7, all the variables had the dots forming a pattern along the diagonal lines. This means that data was normally distributed as seen in all Q-Q plots hereafter.

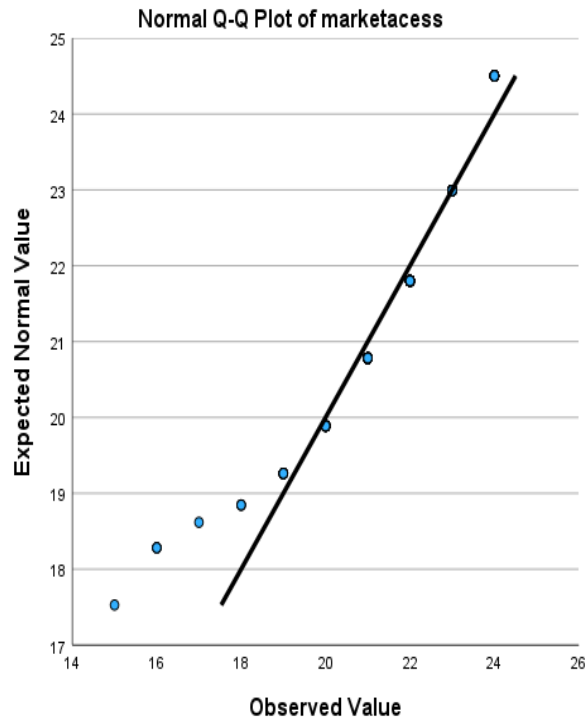


FIGURE 4

Market Access' Normality

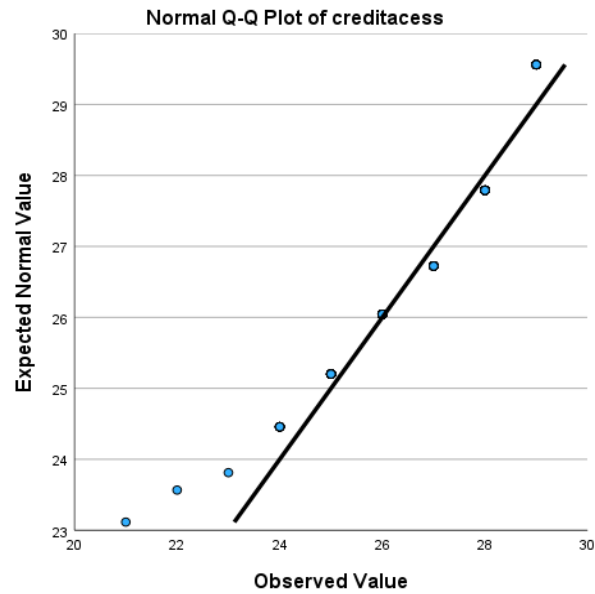


FIGURE 5

Credit Access' Normality



FIGURE 6

Training' Normality

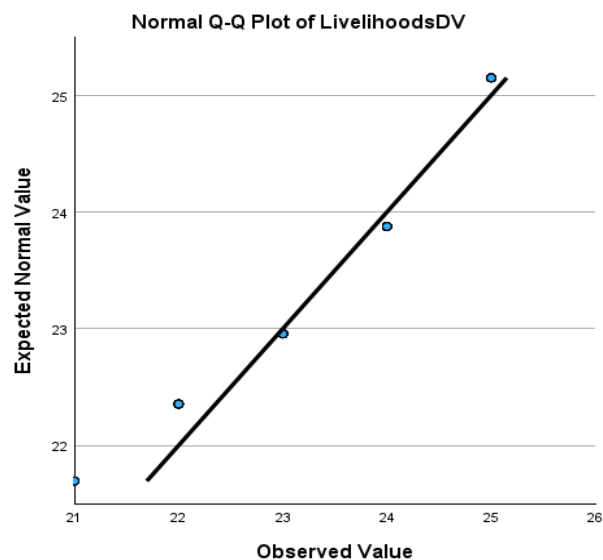


FIGURE 7

Livelihoods' Normality

4.5.2 Multicollinearity

The study employed VIF to determine whether multicollinearity is present or otherwise. Table 8 shows result.

TABLE 8

Multicollinearity

	VIF
Market access	1.318
Credit access	1.228
Training	1.275

In table 8, market access, credit access, and training had a VIF of 1.318, 1.228, and 1.275, respectively. In fact, all variables had their VIF >1 and <10 hence an indication that multicollinearity was absent.

4.5.3 Heteroscedasticity

The study used Breusch-Pagan to test for heteroscedasticity's residuals. The results are shown in table 9.

TABLE 9

Heteroscedasticity

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.000	3	.000	.000	1.000 ^b
Residual	159.912	244	.655		
Total	159.912	247			

a. Dependent Variable: Squared Residuals

b. Predictors: (Constant), training, credit access, market access

As shown by residual table above, the significance value is >0.05 . This means that the model is homoscedastic, thus no indication heteroscedasticity.

4.6 Correlation

Correlation was tested to determine the strength and direct association between variables. The results are showed in Table 10.

TABLE 10**Correlation**

		Market access	Credit access	Training	Livelihoods
Market access	<i>R</i>	1	-.279**	.334**	-.226**
	Sig.		0.000	0.000	0.000
Credit access	<i>R</i>	-.279**	1	.216**	.204**
	Sig.	0.000		0.001	0.001
Training	<i>R</i>	.334**	.216**	1	0.065
	Sig.	0.000	0.001		0.306
Livelihoods	<i>R</i>	-.226**	.204**	0.065	1
	Sig.	0.000	0.001	0.306	
	N	248	248	248	248

** . Correlation is significant at the 0.01 level (2-tailed).

Table 10 indicates that market access depicted a direct negative significant correlation with livelihood of dairy farmers ($r = -0.226$; sig. = 0.000). The results imply that a decrease in market access will lead to not improve farmers' livelihoods. A study by Jayasena et al. (2019) showed positive significance of supporting dairy farmers to access markets to improve livelihood. In yet another research, Kumar et al. (2018) found that insufficient marketing infrastructure and ineffective marketing channels were to blame for both the high and volatile consumer pricing and the fact that only a small portion of consumer rupees reach farmers. Again, it was established that credit possessed a positive correlation with livelihoods ($r = 0.204$; sig. = 0.001). The results could be interpreted to mean that by increasing credit access, farmers' livelihoods will equally increase. In support, Yunusa et al. (2018) showed a positive correlation between financial support resulting from co-operatives and livelihood improvements. The research revealed that training had a positive insignificant correlation with livelihoods ($r = 0.065$; sig. = 0.306 > 0.01). Therefore, by increasing training amongst farmers, their livelihoods will in turn increase courtesy of improved knowledge

and skills in dairy farming. However, research by Mwebia (2020) showed a strong relationship between management and training and cooperatives' performance. Specifically, it was discovered that training improved performance as indicated by the current study that also established that training improved farmers livelihoods.

4.7 Regression Analysis

Regression was utilized to establish the relationship between predictors and dependent variables. The subsequent tables illustrate the results.

TABLE 11
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.290 ^a	0.084	0.073	0.80955

a. Predictors: (Constant), Training, Credit access, Market access

The table shows that R^2 is 0.084. This means that the model predicts about 8.4% in the variation in farmers' livelihood. The remaining fraction can be represented by other variables that were not utilized in this research.

TABLE 12

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	14.633	3	4.878	7.442	<.001 ^b
Residual	159.912	244	0.655		
Total	174.544	247			

a. Dependent Variable: Livelihood

b. Predictors: (Constant), Training, Credit access, Market access

Table 12 shows that the model is significant at 0.01, actually, the p-value is 0.001. This implies that F-stat (7.442) that has MS OF 4.878 is significant. From the results, it can be said that the model was significantly reliable hence suitable for analysis.

TABLE 13

Coefficients

Model	Unstandardized	Standardized		t	Sig.
	Coefficients	Coefficients			
	B	Std. Error	Beta		
1 (Constant)	20.528	2.180		9.416	0.000
Market access	-0.131	0.039	-0.235	-3.342	0.001
Credit access	0.067	0.041	0.112	1.649	0.100
Training	0.143	0.083	0.120	1.728	0.085

a. Dependent Variable: Livelihoods

$$Y = 20.528 + -0.131\text{Marketaccess} + 0.067\text{Creditaccess} + 0.143\text{Training} + 2.180$$

It was revealed that market access had a negative significant relationship with dairy farmers' livelihoods ($\beta = -0.131$; p-value= 0.001). The results can be interpreted to mean that a reduction in market accessibility by -0.131 will fail to improve livelihoods amongst farmers in Kiambu. Meanwhile, works by Jayasena et al. (2019) showed positive significance support of dairy farmers to access markets to improve their livelihoods. Additionally, Ouma et al. (2020) found that, the main point of contact between dairy farmers and milk dealers (collectors) in milk producing areas is the marketing of milk products across the three regions, however transportation was somehow hectic to some farmers and this impeded access to markets. Further, it was determined that credit access had positive insignificant relationships with livelihoods ($\beta = 0.067$; p-value=0.100). This implies that by increasing credit accessibility, farmers livelihoods will improve by 6.7%. In congruence, Waliaula (2017) found that cooperatives had a strong positive

relationship with livelihood because it empowered their economic development through provision of credits to farmers who in turn used such loans to improve their dairy activities. Lastly, it was established that training possessed positive insignificant relations with livelihoods ($\beta = 0.143$; $p\text{-value} = 0.085$). Therefore, by increasing training related activities by 14.3%, farmers' livelihoods will equally increase by similar fraction. Notably, training depicted the highest prediction on farmers' livelihoods. These results are line with Kiswili et al. (2019) who established that farmers' performance is significantly and positively impacted by human capital empowerment via training and development. In fact, similar to this research, SACCOs positively impacted farmers knowledge, skills, and experience.

Further, the t-stat (9.416) for the constant (20.528) is also significant with a p-value of 0.000 and SE of 2.180. This means that the Y intercept is statistically significant, therefore, the research model showed a non-zero outcome with all predictors remaining at zero.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The first subsection of this chapter presents findings' summary. Meanwhile, the second part contains conclusion based on the findings. Finally, recommendations were also drawn as per the findings.

5.2 Summary

5.2.1 Effect of market access on livelihoods of local community farmers

The research established that respondents predominantly agreed that markets for selling dairy products are distantly located hence affecting timely deliveries. It was again revealed that respondents widely agreed that due to stiff competition from other farmers within the county, they sometimes sell dairy products cheaply. Again, it was established that most respondents widely agreed that the cost of transportation makes it harder for many farmers to realize good income. Further, poor road networks in remote areas were found to have hugely contributed to untimely delivery of dairy products while stringent health related standards inhibited farmers' ability to scale up milk sales to distantly located markets.

Using correlation, it was indicated that market access depicted a direct negative significant correlation with livelihood of dairy farmers. Similar, to correlations, regression revealed that market access had a negative significant relationship with dairy farmers' livelihoods.

5.2.2 Effect of credit access on livelihoods of local community farmers

It was established that farmers were able to access loans in real time to boost their dairy farming related activities and cooperatives also provided loans to eligible members with no collateral requirements. Meanwhile, it was realized that availability of credit offered by

cooperatives made it easy for farmers to apply and access loans within shorter time whereas credit repayment duration was friendly to dairy farmers. It was also found that the interest charged on loans was friendly to majority of farmers and cooperatives also offered adequate grace period before starting to service credit provided.

Via correlation, it was established that credit possessed a positive correlation with livelihoods. The correlation results support regression that also revealed that credit access had positive insignificant relationships with farmers' livelihoods.

5.2.3 Effect of training on livelihoods of local community farmers

The results showed that cooperatives regularly offered basic education on business management techniques and that training received from various cooperatives enabled farmers to generate more income. It was again revealed that farmers' skills on dairy farming management improved thanks to ongoing training and this contributed to business development knowledge courtesy of financial management education received from cooperatives. It was also found that cooperatives offered free training sessions to enable farmers acquire adequate knowledge in running their dairy activities in as much as they regularly organized workshops and seminars for members to enhance their knowledge.

From correlation, results revealed that training had a positive insignificant correlation with livelihoods. These results are similar to regression that equally established that training possessed positive insignificant relations with livelihoods.

5.2.4 Livelihoods of local community farmers

This research revealed that farmers family wellbeing has improved thanks to dairy cooperatives. This is demonstrated by the fact that they were able to afford food courtesy of dairy cooperatives that supports the development of dairy business, they were able to educate their

children thanks to continuous financial and business management support from dairy cooperatives. Further, improved livelihood also improved as a result of increase on farmers' income level due to membership with various cooperative societies that supports the growth of dairy activities. Additionally, farmers were also able to open savings account as a result of business development support from cooperative societies within the county.

5.3 Conclusions

In reference to effect of market access on livelihoods of local community farmers, the study concluded that market access had negative effect on the livelihoods of the local dairy farmers. The negative effect was occasioned by distantly located markets for selling dairy products, stiff competition from other farmers within the county, cost of transportation, and poor road networks especially in remote areas.

In connection to effect of credit access on livelihoods of local community farmers, the study concluded that credit access had a positive effect on dairy farmers livelihoods. This was rightly so as evidenced by the fact that farmers were able to access loans in real time, cooperatives' credit with adequate grace period were available alongside friendly interest rates charged.

Concerning effect of training on livelihoods of local community farmers, the research concluded that training had positive effect in farmers' livelihoods. This supported by most farmers who argued that cooperatives regularly offered basic education through training, seminars, and workshops that consequently improved their skills on dairy farming management.

In relation to livelihoods of local community farmers, this research concluded that farmers wellbeing had improved since they were able to afford food, educate children, and open savings account as a result of increase on their income level that resulted from membership with various cooperative societies.

5.4 Recommendations

On effect of market access on livelihoods of local community farmers, this research recommends that local and national government should support in the upkeep and repair of rural roadways to enable the efficient and economical delivery of dairy products by farmers. More pickup points should also be introduced to ensure that farmers access markets on timely basis to avoid spoilage and unnecessary additional transportation costs. Farmers' income and standard of living would increase as a result of these measures since it would decrease spoiling rates, lower transportation costs, and improve market accessibility.

Regarding effect of credit access on livelihoods of local community farmers, the research recommends that cooperatives should create loan solutions that suit farmers' needs and preferences in order to boost credit uptake. This could involves offering monetary services that meet the needs of both investment and consumption as well as credit with adjustable payback plans that align with dairy income cycles. These customised goods can strengthen farmers' capacity to make investments in farm upgrades, which will raise output and revenue, and ultimately, improved livelihoods.

In line with effect of training on livelihoods of local community farmers, the research recommends that Cooperatives ought to add financial literacy to their training curricula, emphasising subjects like debt management, savings, and budgets. Superior resource allocation and higher revenue would result from farmers being able to arrive at well-informed financial decisions. Cooperatives must also put in place training initiatives that instruct farmers on how to enhance dairy products' values. This could involve entrepreneurial, marketing, and product creation abilities, encouraging creativity and opening up new revenue streams for farmers.

5.5 Areas for Further Research

The study focused on dairy cooperative services and livelihoods of local community farmers in dairy farming in Kiambu County, Kenya. The study recommends that a future study ought to focus on a similar topic but with a focus on all dairy farmers in selected counties in Kenya. Such research is necessary since it will give a national general outlook on how dairy cooperative services affect livelihoods of local dairy farmers across the country.

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APPENDICES

APPENDIX I: INTRODUCTION LETTER

Dear Participant,

RE: DATA COLLECTION REQUEST

I am a Master student of Science in Development Finance at KCA. I am required to complete a thesis study entitled “**DAIRY COOPERATIVE SERVICES AND LIVELIHOODS OF LOCAL COMMUNITY FARMERS IN KIAMBU COUNTY, KENYA**”. To help me fulfil my academic goals, I humbly ask for your assistance in this study. The information provided will solely be utilised for educational purposes and will be handled with the highest confidentiality.

Thank you in advance,

Yours sincerely,

James Muiruri

APPENDIX II: QUESTIONNAIRE FOR FARMERS

Please check the relevant box (close-ended questions). Additionally, please complete open-ended question.

PART ONE: DEMOGRAPHIC INFORMATION

1. Highest educational Level? [] None [] Primary [] Secondary [] College/tertiary [] University []

2. Duration as a farmer-years? Below a year [] 1-5 [] 5-10 [] Over 10 years []

PART TWO: EFFECT OF MARKET ACCESS ON THE LIVELIHOODS OF LOCAL COMMUNITY FARMERS IN KIAMBU COUNTY.

3. The statements regarding the effect of market access on the livelihoods of local community farmers in Kiambu County are provided below. Kindly rate each of the following items on a scale of 1 to 5, with 1 denoting strongly disagree, 2 disagree, 3 not sure, 4 agree, and 5 strongly agree.

Items	1	2	3	4	5
The markets for selling our dairy products are distantly located hence affecting timely deliveries					
Due to stiff competition from other farmers within the county, we sometimes sell cheaply					
The cost of transportation makes it harder for many farmers to realize good income					
Poor road networks in remote areas have hugely contributed to untimely delivery of our dairy products					
Stringent health related standards inhibit our ability to scale up milk sales to distantly located markets					

PART THREE: EFFECT OF CREDIT ACCESS ON THE LIVELIHOODS OF LOCAL COMMUNITY FARMERS IN KIAMBU COUNTY.

4. The statements regarding the effect of credit access on the livelihoods of local community farmers in Kiambu County are provided below. Kindly rate each of the following items on a scale of 1 to 5, with 1 denoting strongly disagree, 2 disagree, 3 not sure, 4 agree, and 5 strongly agree.

Items	1	2	3	4	5
I am able to access loans in real time to boost my dairy farming related activities					
The cooperatives provide loans to eligible members with no collateral requirements					
Availability of credit offered by cooperatives make it easy for me to apply and access loans within shorter time					
The credit repayment duration is friendly to dairy farmers within Kiambu County					
The interest charged on loans can be said to be friendly to majority of us					
My cooperative offers adequate grace period before starting to service credit provided					

PART FOUR: EFFECT OF TRAINING ON THE LIVELIHOODS OF LOCAL COMMUNITY FARMERS IN KIAMBU COUNTY.

5. The statements regarding the effect of training on the livelihoods of local community farmers in Kiambu County are provided below. Kindly rate each of the following items on a scale of 1 to 5, with 1 denoting strongly disagree, 2 disagree, 3 not sure, 4 agree, and 5 strongly agree.

Items	1	2	3	4	5
My cooperative regularly offers basic education on business management techniques to us					
The training received from my cooperative has enabled me to generate more income					
My skills on dairy farming management has been improved thanks to ongoing training by my cooperative					

My business development knowledge has enhanced, and this is attributable to financial management education received from my cooperative					
My cooperative offers free training sessions hence most members have acquired adequate knowledge in running their dairy activities					
My cooperative regularly organizes workshops and seminars for members					

PART FIVE: THE LIVELIHOODS OF LOCAL COMMUNITY FARMERS IN KIAMBU COUNTY.

6. The statements regarding the livelihoods of local community farmers in Kiambu County are provided below. Kindly rate each of the following items on a scale of 1 to 5, with 1 denoting strongly disagree, 2 disagree, 3 not sure, 4 agree, and 5 strongly agree.

Items	1	2	3	4	5
My family's wellbeing has improved thanks to dairy cooperatives					
I am able to afford food courtesy of dairy cooperatives that supports the development of my dairy business					
I am able to educate my children thanks to continuous financial and business management support from dairy cooperatives within the county					
My income level has risen due to my membership with various cooperative societies that supports the growth of my dairy activities					
I am able to open savings account as a result of business development support from my cooperative society					

7. As a member of cooperative society, how has your membership with cooperatives influenced your livelihoods?

APPENDIX III: ETHICAL APPROVAL LETTER



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BOARD OF POSTGRADUATE STUDIES

KCAU/BPS/2025

Date: Thursday, September 25, 2025

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION (NACOSTI)
P.O BOX 30623-00100
NAIROBI

Dear Sir/Madam,

RE: JAMES KARANJA- REG NO.17/00685

It is my distinct pleasure to introduce James Karanja, a student at our institution pursuing Master of Science in Development Finance degree in the School of Business.

James is conducting research on the topic *“Effect of Cooperatives on livelihoods of local community members in dairy farming in Kiambu county, Kenya.”* His study has been reviewed and approved by the University’s Ethics Review Committee, Approval No. KCAUSERC/SOB0310. The Approval period is from 8th September 2025 – 8th September 2026.

Any assistance accorded to him is highly appreciated.

Yours faithfully,

DR. JACKSON NDOLO
DIRECTOR, BOARD OF POST GRADUATE STUDIES

APPENDIX IV: NACOSTI RESEARCH PERMIT

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 924458	Date of Issue: 08/October/2025
RESEARCH LICENSE	
	
This is to Certify that Mr., James Muiruri Karanja of KCA University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kiambu on the topic: DAIRY COOPERATIVE SERVICES AND LIVELIHOODS OF LOCAL COMMUNITY FARMERS IN DAIRY FARMING IN KIAMBU COUNTY, KENYA for the period ending : 08/October/2026.	
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