FINANCING AGRICULTURAL VALUE CHAIN IN KENYA:
CHALLENGES AND OPPORTUNITIES IN THE DAIRY
SUBSECTOR

BY

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DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University in Nairobi for academic credit.

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This project report has been presented for examination with my approval as the appointed supervisor.

Signed: _________________________ Date: _________________________

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Signed: _________________________ Date: _________________________

Dean, Chandaria School of Business
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ABSTRACT

The role of value chain financing in the development field and especially, in the agriculture sector in agriculture is well established. Attempts to foster financial systems in the Kenyan dairy subsector have been advocated by officials concerned with the value chain financing. The purpose of this study was to investigate the financing agricultural value chain in Kenya where the focus was on challenges and opportunities in the dairy subsector. It explored value chain financing gaps in Nakuru, with a focus on the dairy value chain.

The research design was descriptive in nature focusing on dairy farmers in Nakuru. The target population of this study comprised of 3094 respondents who were the dairy farmers spread across the four districts in the County including Nakuru, Nakuru North, Naivasha and Molo. Nakuru was chosen for the study because of the large number of actors involved, especially at the level of producers and traders. Information was collected using a questionnaires developed by the researcher. Data was analyzed using Statistical Package for Social Sciences version 12.0 (SPSS), Ms Excel 2003/2007. Descriptive statistics were used such as mean and inferential statistics to analyze the data. Multiple regression models were used to analyze the data too. Moreover, a t-test for statistical significance level of 0.5 was used. Regression was as a statistical technique used to examine the way a number of independent variables relate to one dependent variable. This procedure attempted to predict a single dependent variable from any number of independent variables entered into regression equations.

The study found that the main financial services provided to dairy farmers in the county of Nakuru are loans, banking and insurance services. From the study, it is evident that most dairy farmers are not satisfied with the services rendered mainly due high cost of interests on credit and cost of inputs required in production.

The study further found that lack of positive relationship between access to financial services and reason for venturing in dairy sector could be extended to mean that most respondents did not fully see dairy farming as purely commercial enterprise and as such had not maximized returns on the venture. It was also evident from the data that high interest rates on credit remain a big barrier to access to finances by dairy farmers.
The study further found that there are various constraints facing the dairy value chain financing among dairy farmers in Nakuru in Kenya which include high interest rates, lack of collateral/loan security and information about credit products. The government has not put in place laws to regulate prices of dairy products and costs of inputs leading to a lot of difficulties on the part of the farmers.

To address this gap, the government and financial services providers should find ways of reducing interest on available credit products and the choice of financing among dairy farmers in Kenya as being both institutional factors being cost of credit, flexibility of loan repayment, collateral demands, application procedures, proximity to lending institutions and size of loan available and personal factors being age, gender, experience in business and level of education. The financial institutions should take cognizance of this fact be encouraged in policy and in practice in order to improve the lot of dairy sector entrepreneurs participation in their programs. A policy to give incentives to financial services providers giving cheap credit to farmers ought to be considered. With increasing unemployment in other sectors, agriculture and in particular dairy farming is an alternative source of employment. It should therefore facilitate the growth of this sector by putting in place policies that favor low interest borrowing, affordability of inputs among others.
ACKNOWLEDGMENT

I wish to thank The Almighty God for giving me a gift of life to write this work. I wish to express my gratitude to my supervisor, Dr. Amos Njuguna for his professional guidance in research methodology and motivation that enabled me compile this project. Special thanks are to my workmates who gave me the opportunity to study this degree. I also extend gratitude to my classmates whose presence offered me the psychological motivation and need to learn.
DEDICATION

I dedicate this work to my family for their moral support, their constant encouragement and demonstrating great concern during my study.
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<th>Full Form</th>
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<tr>
<td>USAID</td>
<td>United State Agency for Development</td>
</tr>
<tr>
<td>hCGAP</td>
<td>Consultative Group to Assist the Poor</td>
</tr>
<tr>
<td>TA</td>
<td>Technical assistance</td>
</tr>
<tr>
<td>NGOs</td>
<td>Non-Governmental Organizations</td>
</tr>
<tr>
<td>GTZ</td>
<td>Development organization of Germany</td>
</tr>
<tr>
<td>IIRR</td>
<td>International Institute of Rural Reconstruction</td>
</tr>
<tr>
<td>SACCOs</td>
<td>Savings and Credit Cooperatives</td>
</tr>
<tr>
<td>MFIs</td>
<td>Micro Finance Institutions</td>
</tr>
<tr>
<td>MSME</td>
<td>Medium Small and Micro Enterprises</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Per-capita</td>
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CHAPTER 1: INTRODUCTION

1.1 Background of the Problem

Agriculture is the backbone of the Kenyan economy directly contributing 24% of the GDP valued approximately at KSh342 billion in the year 2009 and another 27% indirectly, valued at KSsh.385 billion (Kenya National Bureau of Statistics, 2013; 2012). In 2008, the sector contributed 21% of real GDP. Dairy farming contributes makes up 3% of this GDP. Despite the fact that Kenya’s and Africa’s economic mainstay is Agriculture, financial institutions are not lending to this sector (World Bank, 2009).

The agricultural industry is important for the Kenyan economy as it provides opportunities for job creation, food production and overall spill over economic growth. According to USAID (2005), Agriculture has long been the economic base of most countries in Sub-Saharan Africa. However, financial access for agricultural production has been difficult. Some of the challenges include: high transaction costs for both borrowers and lenders, high risks faced by borrowers and lenders, lack of reliable financial information about rural households (compounding transactions costs and risk) and financial products are ill suited to the financial flows of the borrowers or lenders (USAID, 2005).

Agriculture continues to be a fundamental instrument for sustainable development and poverty reduction’ (World Bank, 2008), yet, ‘financial constraints in agriculture remain pervasive, and they are costly and inequitably distributed, severely limiting smallholders’ ability to compete’ (ibid). Sudden and dramatic changes in food prices have exposed the vulnerability of agricultural production in meeting global demand and call for increased investment in agriculture at all levels (Das & Baria, 2005). The question is how the right amount of investment can be acquired, particularly in a challenging milieu where financial uncertainty causes a reduction in available resources along with increased fear and scrutiny of risk. An answer to addressing these constraints goes beyond conventional measures since agriculture has always been difficult to finance through formal financial institutions and approaches (Ghore, 2007). The environment for agricultural finance is further influenced by the growing concentration of control in the agricultural sector.
Agricultural finance comprises the full range of financial services - loans, savings, insurance, and payment and money transfer services - needed, offered, or used in rural areas by households and enterprises and agricultural finance refers to financial services ranging from short-, medium- and long-term loans, to leasing, to crop and livestock insurance (USAID, 2007). Those in agribusiness require a range of financial services that include; provision of safe, liquid and convenient savings (deposit) facilities and access to credit facilities tailored to the meet the needs of Agri businesses; credit for consumption smoothing and investment in agricultural production, systems for effecting payments and transfer of remittances (Miller & Jones, 2010); and general insurance and cover against variability in output (especially as agriculture is largely weather-dependent), price and marketing uncertainty (Jansen & Averch, 2009).

As stated by Campion (2006), finance often looks different when provided within a value chain than from a financial institution. Not only is the nature of the finance often different, but so are the motives. Cherogony (2007) notes that in Africa ‘value chain actors are driven more by desire to expand markets than by the profitability of the finance’. Traders, for example, commonly use finance as a procurement facility while input suppliers often employ it as part of a sales incentive strategy. For financial institutions, it offers an approach to lower risk and cost in providing financial services. For the recipients of value chain finance, such as smallholder farmers or those purchasing their products, value chain finance offers a mechanism to obtain financing that may otherwise not be available due to a lack of collateral or transaction costs of securing a loan, and it can be a way to guarantee a market for products (Agrawal, 2007).

Understanding value chain finance can in actual terms improve the general effectiveness of those providing as well as those requiring agricultural financing. It can also improve the quality and the efficiency of financing the agricultural chains through identifying financing needs for the strengthening the value chain finance through; the tailoring of financial products in order to fit the needs of the participants in the chain; also by reducing the transaction of financial costs through direct discounting of repayments and also the delivery of financial services; additionally, also the use of value chain connection and knowledge of the chain so as to mitigate the risks concerning the chain and its partners (Gonzalez-Vega, 2006). The modernization of agriculture and agribusiness with the increased integration as well as interdependent relationships, including the
opportunity and the need for value chain finance therefore becomes increasingly important.

Driven by gains from economies of scale and globalization of the food chain along with access to resources, multinational and other interconnected agribusinesses have a greater impact in a sector that is characterized by increasing vertical and horizontal integration. The consequences of tightening integration are profound, especially for smallholders and others who are outside of the interlinked chains (Hegbe, 2007). In summary, agriculture is evolving towards a modern, extremely competitive system driven by consumer demand for higher value, more processed products, and consistent quality and safety standards. Hence, enhancing smallholders’ productivity, competitiveness and their participation in these global value chains have been noted as priorities of the agriculture-for-development agenda (World Bank, 2008). Agricultural finance of value chain offers an opportunity to reduce cost and risk involved in financing, as well as reaching out to the smallholder farmers. For financial institutions, value chain finance creates the impetus to look beyond the direct recipient of finance to better understand the competitiveness and risks in the sector as a whole and to craft products that best fit the needs of the businesses in the chain.

Naturally, this more comprehensive approach to agricultural financing is not unique to value chain finance; some leading financial organizations in the sector employ such a focus in their loan assessment processes but this is more often not the case (Cherogony, 2007). In fact, much of the finance available to value chains is not from financial institutions but rather from others within the chain. At the same time, value chain finance can help the chains become more inclusive, by making resources available for smallholders to integrate into higher value markets. Finance that is linked with value chains is not new and some types of trader finance, for example, have been around for millennia; what is new is the way it is being applied more systematically to agriculture, using innovative or adapted approaches, tools and technologies (World Bank, 2008). This suggests that structured value chains whereby producers are directly linked to a market have access to finance as is the case with the dairy value chain in Kenya.

The dairy industry is the most developed of the livestock subsectors in the agriculture sector and is comparatively well developed relative to the dairy industries of other countries in sub-Saharan Africa. Dairy production provides a unique development
strategy as a source of livelihood for most smallholder farmers not only providing income through milk sales but also, milk for home consumption (USAID, 2005). Despite significant contribution of the dairy sector, it is notable that agricultural financing in this sector is still not responsive to the needs of the dairy farmers.

1.2 Statement of the Problem

Although the Kenyan government has made some advances in broadening access to credit, most small-scale and emerging farmers still do not have access to affordable credit (World Bank, 2009). The role of value chain financing in the development field and especially, in the agriculture sector in agriculture is well established. Attempts to foster financial systems in the Kenyan dairy subsector have been advocated by officials concerned with the value chain financing. Due to its role in economic development value chain financing in agriculture has drawn much attention in the developed and the developing countries.

For instance, Heiko Bammann (2007): in his paper, ‘Participatory value chain analysis for improved farmer incomes, employment opportunities and food security’, states that, collaboration between government agencies, non-governmental agencies, and private agribusinesses offers the greatest potential for applying the value chain concept, with the aim of increasing income and employment through improved farming.

According to Farrington & Mitchell (2006) in response to these dynamics, value chain development is taking many forms and methods to address emerging challenges and leverage new opportunities. A critical input in facilitating AVC development is finance, in terms of availability of financial products to facilitate response to changing market requirements and meeting VC actors’ critical needs.

According to Campion (2006) agricultural finance has always been difficult for a variety of reasons including high transaction costs, high risk, asymmetric information, unfavorable economic policies, lack of guarantees, wide client dispersion, and suboptimal infrastructure in rural areas. However, empirical evidence on the challenges experienced by small scale farmers in accessing financial services is quite rare and too general.

Although there are many studies that have been done on dairy value chain financing, there are very few published accounts of the dairy value chain financing challenges based
on robust scientific research methodology. Based on the identified gap, this study aimed at providing answers to the following question using a case of Nakuru milk shed. This research is expected to establish financial constraints, challenges and opportunities experienced by rural producers working in the dairy sector in the context of the value chain.

1.3 Purpose of the study
The purpose of this study was to investigate the financing agricultural value chain in Kenya where the focus was on challenges and opportunities in the dairy subsector.

1.4 Research Questions
The study research questions were:
1.4.1 What are the core financial activities and services rendered to small-scale dairy farmers in Nakuru Milk shed by the financial services providers?
1.4.2 What are the constraints in the dairy value chain financing among dairy farmers in Nakuru in Kenya?
1.4.3 What are the policy implications influence the dairy value financing among dairy farmers in Nakuru in Kenya?

1.5 Importance of the Study
The study identifies the relationship and importance of finance in enhancing and making efficient agricultural value chains. The financing part of the value chain study was not well academically explored. This report would add to existing literature on value chain financing in the agricultural sector (the research also provides important insights and information to financial institutions on the opportunities existing in value chain financing in agriculture by properly managing risks and lowering of operations costs of the institutions. The report would provide information to the government and financial institutions on the pitfalls of financing certain segments of the sectors and actors in value chains. The results of the study would advise not only the financial sector, but also the government, and academic institutions on the importance of funding research in agriculture.

1.5.1 Agricultural Financiers
The study identifies the relationship and importance of finance in enhancing and making efficient agricultural value chains. The research also provides important insights and
information to financial institutions on the opportunities existing in value financing in agriculture by properly managing risks and lowering of running costs of this institutions.

1.5.2 Government Agencies and Policy Makers

The government/ministry of agriculture/livestock would also benefit from this study for decision making concerning the small scale dairy farming. The results of the study will guide policy making by the relevant institutions whose economic activities touch on dairy farming. The report would provide information to the government institutions on the pitfalls of financing certain segments and the actors in value chains especially in the agricultural sector. The results of the study would advise not only the agriculture sector, but also the government, and academic institutions on the importance of funding research in agriculture.

1.5.3 Farmers and Farm Managers

To farmers, the study would facilitate beneficial decision making touching on the factors that affect production of milk. This way the farmers would make better decisions addressing the actual challenges to milk production and therefore better management practices. Agricultural officers would also find this study a resource as they can use its findings and recommendations to advice the farmers on the proper milk production practices and hence enhance milk production in the area and the country as a whole.

1.5.4 Researchers and Scholars

The financing part of the value chain study was not well academically explored and this report would add to existing literature on value chain financing in the agricultural sector. The study findings would lay a foundation for further research and understanding of the financing agricultural value chain in Kenya with an aim of establishing the challenges and opportunities in the dairy subsector. Academicians in the area of management and performance would also gain from this study as reference source.

1.6 Scope of the Study

The study was conducted at the dairy value in the Nakuru. The Rift Valley Province has 64 districts. Nine of these districts (Nakuru, Naivasha, Nakuru North, Rongai, Molo, Njoro, Kuresoi, Subukia and Gilgil) form the Nakuru County where the investigation took place. Further, Nakuru is one of the key milk producing areas in Kenya. It has one of the largest milk shed in Kenya involving a wide range of actors. Accordingly, studying the
dairy value chain in Nakuru provided a representative sample of agricultural based value chains Kenya.

1.7 Definition of terms

1.7.1 Agricultural Finance

Agricultural Finance is ‘a sub-set of rural finance dedicated in the financing of agriculture-related activities, for instance, input supply, wholesaling, production, distribution and marketing’ (Painter, 2009)

1.7.2 Chain Actors

Chain actors are those directly involved in the production and sale of the agricultural products. This includes farmers, co-operatives and traders. Chain actors differ from chain supporters from the right to ownership they have over the product. Chain actors own the product. Chain supporters support actors in the chain in finance and other services but have no ownership right over the product (Debebe, 2010).

1.7.3 Chain Supporters

Chain supporters are the service providers e.g. banks, microfinance institutions, insurance companies, transporters, brokers and other supporters including NGO’s, government agencies and research centers, (Kula, Jeanne & Michael, 2006). These institutions provide services like loans, pre-financing, shareholdings, factoring and leasing.

1.7.4 Financing need

Chain actors need finances for different purposes of production. The farmers need funds to purchase inputs, traders to purchase the product and equipments while retailers need working capital for operations. One financial institution may support one or more actors in the chain. Outside the formal financial institution, actors often have trade finances like sales on credit and advance payments (Neven, 2008).

1.7.5 Value Chain

This is the full range of activities required to move a product or service from conception throughout the different phases of the process of production to the final delivery to final consumers and disposal after use (Kaplinsky, 2000). It the set of actors (private, public, and including service providers) and the sequence of value-adding activities involved in bringing a product from production to the final consumer. In agriculture they can be thought of as a “farm to fork” set of inputs, processes and flows (Miller & Jones, 2010).
1.7.6 Value chain finance
Value chain finance is the (financial) relationship between two or more actors within the value chain (Neven, 2008). In this study, value chain finance refers to finance flowing within the value chain (i.e., direct finance), as well as finance flowing to the value chain (i.e., indirect finance), such as from financial institutions.

1.7.7 Value Chain Analysis
It is the assessment of the actors and factors influencing the performance of an industry, and relationships among participants to identify the main constraints to increased efficiency, productivity and competitiveness of an industry and how these constraints can be overcome (Jansen, 2007).

1.7.8 Value Chain context
This covers the economic environment (inflation, interest rate, economic growth, competition), Political system, security, Infrastructure, natural environment, the legal system (Jansen, 2007).

1.7.9 Value Chain Finance
It is the linkage between financial institutions to the value chain, offering financial services to support the product or service flow and the creation of relationships in the value chain (Kaplinsky, 2000). These are financial services and products flowing to and/or through value chain participants to address and alleviate driving constraints to growth (Jansen, 2007).

1.8 Chapter Summary
Chapter one provides a background of value chain financing in Kenya. The chapter has presented the background to the research problem, the statement of the research problem, research questions and subsequently the specific objectives of the study. The significance and scope of the study as well as the definition of key terms and concepts have also been clearly presented. The general objective of this study was to investigate the challenges and opportunities in the financing of agricultural value chain in Kenya and specifically in the dairy subsector.

Chapter two reviewed the literature relevant to the specific objectives of the study. Chapter three discussed the research approach used in the study while chapter four presents the findings of the study in tables and figures based on the research objectives.
and lastly chapter five presented the findings and draw as conclusions and recommendations based on the findings of the study.
CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the literature on access to finance by agricultural value chains. There exists limited literature on agricultural value chain financing in the dairy subsector in the Kenyan Environment. However, several studies on the agricultural value chain exist in other countries. These studies both in the Kenyan, African and the world arena form the basis of the literature for this study. Sections covered by this report include the concept of value chain and its applications, importance and constraints of value chains, Framework of value chain finance and Ways of improving access to financial services.

2.2 Financial Activities and Services Offered to Farmers

According to Annica (2004), value chain finance refers to the financial relationship between two or more actors within the value chain. When a farmer sells a product to a trader, two things change hands: the product goes in one direction, and money goes in the other. This exchange is repeated at each stage in the chain. Value chain finance is when one, or more, financial institutions link into the value chain, offering financial services which build on the relationships in the chain. Finance is critical to increasing efficiency, improving product quality, and raising the productivity and income of value chain actors. Without access to finance, small farmers will continue to make little investment, have low-return production systems, and be unable to use their farm resources optimally.

Financial constraints may prevent small and medium-scale traders and processors from expanding their capacities, thus limiting the amount of produce they can buy from small farmers and other local raw material suppliers. Finance is therefore critical in the various stages of the value chain. There are two types of value chain finance are direct and indirect; Direct value chain finance; is finance that one value chain actor provides to another. This is practiced in developing economies like Nepal where the financial institutions are clustered around the cities and district headquarters (Painter, 2009). Through financing the agriculture value chain by considering the different actors from small farmers to corporate agribusinesses it is possible to overcome the challenges of agriculture in a country. This can only be possible through innovative approaches to serve the different segments by considering their differences in their activities, finance requirements, understanding of farming business and management of loans.
It has also been proved beyond doubt that access to finance to the different actors has helped in reducing production unit cost, increase production volume while adding value in the chain. Indirect value chain finance; finance is provided from outside the value chain actors (mainly from financial institutions) on the basis of the borrower’s value chain activities. Indirect value-chain finance from the financial institutions is a process that is long-term and complements as well as builds off the strength of value-chain relationships. The advantages of these value chain relationships include improved skills and secure markets which make potential borrowers much more creditworthy (attractive) to the financial institutions. Therefore lending by means of financial institutions is more explicit than the direct value chain lending because it is not entrenched into another commercial contract (Porter, 1998).

The importance of financial services to the smallholder farm enterprises cannot be over emphasized. These services may be provided through either formal institutions such as banks, government projects and contract farmer schemes and/or informal institutions including family and friends, local money lenders and rotating or accumulating savings and credit associations. The rural financial markets, in particular, continue to be characterized by a number of weaknesses including limited access to rural customers; high cost of services; absence of convenient savings facilities; financial non-viability of institutions; lack of active competition; and inability to expand services to respond to and create opportunities (Nwanna, 2000).

The actual implementation experience of many recent Bank projects containing components aimed at increasing the availability of rural, micro, or small enterprise financial services has been mixed. The availability of appropriately-designed financial services is an essential component of the enabling environment for rural economic growth and poverty reduction. Access to working capital or investment credit offered by rural finance institutions can substantially accelerate the adoption of modern agricultural technologies and production patterns which improve the ability of the rural sector to provide for the subsistence needs of the poor, produce the surplus in primary and intermediary products required for urban consumption and export, and avoid environmental degradation. Suitable credit products can also permit entrepreneurs to take advantage of investment opportunities in processing and off-farm enterprises.
2.2.1 Access to Financial Resources

According to KIT and IIRR, (2010), the common financial relation between actors in financial institution and actors is a one two one (bilateral relation). The other type of relation is where one or more financial institutions are working together with more than one actor in the value chain. Farmers get credit from microfinance institution and deliver the product to the trader and the traders pays the loan repayment to the financial institution behalf of the farmer, and remit the remaining value of the product to the farmers. This type of arrangement is called triangular value chain finance. The agreement covers product, finance, and information exchange and risk management (John, 1995).

On the other hand, this is not seen as the complete direct value chain financing since it never builds up financial relations among all actors of the value chain and as an alternative limits itself to the rural actors at the very lower levels of any given value chain – specifically, between the farmers, the immediate buyers at the level of the village, and input suppliers – and thus ignores the most powerful players in the value chain like the regional traders as well as exporters, who are seen to have a stronger financial base. The first actor groups in the dairy value chain are producers. Producers sell their products to a milk processor; traders sell their products to processors. Processors sell their end product to retailers and retailers sell their product to end consumers. The dairy processing industry in Kenya comprises of large, medium and small scale processors. Until the 1990s, the Kenya Creameries Corporation (KCC) processed all the milk in Kenya, but its monopoly slowly decreased between 1993 and 1996 (IFAD, 2003).

According to the industry statistics by the Kenya Dairy Board, in 2010, there were an estimated 27 processors, 64 mini dairies, 78 cottage industries and 1138 milk bars. The access to timely, in addition to reasonably priced financial resources plays a significant role in facilitating the inclusion of smallholders into markets that are competitive. Without the timely resources, it is hard to reach the market demands. Typical loans from banks entail relatively high transaction costs on both the lender as well as the borrower, plus the climatic and market risks of the sector which these make such loans unattractive to the lenders and also unavailable or unattractive to the smallholders. Similarly, the usual short-term, relatively the high-cost financing of most the microfinance loan products are not adapted well (Kalton, 1983).
2.2.2 Funding Institutions

The value chain approach resonates with financiers. Most financial institutions are concentrating their hard efforts on developing franchises from the salaried as well as merchant classes of the provincial centres, which they consider as the more attractive market than the poorer farmers. Financial institutions tend to be wary of agriculture per se, although may have particular interests in different sub-sectors such as the dairy, or livestock, or even sub-segments like the input suppliers, logistics, retailers, processors, and the packagers among others. It lines up with the approach to market segmentation which can be quite easily integrated within the marketing as well as risk management strategy of a given financial institution than agriculture as a whole (IFAD, 2003).

Most small-scale farms in Kenya are seen to be both family residences and businesses, which may cause problems when small-scale farmers apply for credit in financial institutions (Mapiye et al, 2006). The owners of large farms also have special credit needs, however because they are have more knowledge on their credit options, they are much more likely to be considered by lending institutions as businesses. This has led to formation of cooperative societies which tries to handle the funding problems facing farmers. With respect to existing credit and risk management for the beef value chain, the authors awarded only two percent of the possible four percent for this rater. This was due to the fact that while some very large commercial ranchers (approximately three percent of the producers) are both credit worthy and insured, the vast majority of producers are pastoralists who access neither credit nor risk management services.

Majority of the farmers will mainly obtain funding from cooperative societies in developing countries. The participatory governance of cooperatives, based on voluntary membership, autonomous decision-making according to one member-one vote, and the return of surplus according to use or to labour rather than to capital, is particularly valued as promoting equitable, democratizing development. Cooperatives are seen to be inclusive not only in enhancing the position of marginalized groups in competitive markets, but also in strengthening their control over the development process, through collective ownership and management of their own productive capacities. In this way, it is argued; cooperatives offer small scale farmers an alternative path of development from their reduction to a semi-agricultural proletariat. (Birchall 2004),
Farmers, suppliers, processors, and buyers need access to finance to operate and develop their businesses. Also, bankers often struggle to contain their risks and costs in financing agriculture. Cooperatives are often viewed as “development promoters” linking farming communities into wider – regional, national and international – networks of information and new knowledge. Cooperatives are also seen to play a particular role in community regeneration, mobilizing local strengths and capacities to address local needs, building on community networks and retaining wealth within the local area. However the funding from cooperative society is not adequate to sustain the financial needs of farmers and this leads to stagnated growth in the development of dairy farming (Attwood 1993).

Commercialized producers, private bulkers, transporters, the majority of cooperatives, processors and terminal markets dealers realize returns capable of attracting commercial finance and are thus creditworthy. Several financial institutions are lending to the dairy value chain (Equity Bank, Coop Bank, KCB, K-Rep and Family Bank, and others). Livestock mortality and theft insurance products are available and accessible.

2.2.3 Cost of Inputs

While intensive commercial dairy farms have developed in spite of the traditional domination of the industry by small backyard growers, they are still constrained in several important areas. High costs of inputs still plagues the industry aided by the low level of rainfall and the high incidence of over-reliance on napier grass and other farm weeds, factors which have cost the dairy industry valuable foreign exchange in lost export opportunities. While the market at the producer level is characterized by competition, the inputs wholesalers and manufacturers are granted local monopolistic power. As a consequence of the power of the inputs wholesalers and the limited market for dairy products, dairy farmers have faced a challenge of high input prices, (Ndebele et al, 2007).

The development of smallholder dairy production is constrained by inadequate livestock nutrition and poor quality feed, poor disease control practices, lack of vaccines, drugs and de-worming. At appraisal, it is found that small farmers and the landless relied on crop residues, low-cost feed and grazing. Weather as well as market factors create feeding challenges for the dairy producer. For instance, wild grass is the major source of feed for dairy cattle. Majority of the dairy farmers use conserved fodder, maize, stover and napier grass to feed their cows. Other used include finger-millet straw, soybean, Lucerne
and grass-hay and silage, (Mapiye et al, 2006 forages; Ngongoni et al, 2006 and Ndebele et al, 2007). Farmers also provide mineral blocks to supplement lactating cows.

2.2.4 Regulation of Financial Institutions

While the dairy value chain is well commercialized, trade is still dominated by small scale, informal traders. While there are technical support and credit relationships among value chain actors, these are far short of their potential. This is probably not so negative for the time being and in time competition and consolidation will increase economies of scale and strengthen relationships between actors. The Government of Kenya has strategically supported dairy and has wisely stepped away from any involvement in the buying and selling of dairy products. The financial success of traditional commercial banking institutions such as Equity Bank of Kenya in serving base of the pyramid markets has also been a catalyst for their peers and competitors to begin to focus more on service provision to this previously ignored market.

Additionally, due to the involvement of regulated financial institutions, the clients have more access to a wider range of financial services, such as insurance, savings, transfers as well as investment credit. The key to success in this kind of mechanism is to facilitate connections between savings and also the credit cooperatives, micro finance institutions (MFIs), as well as commercial banks, and to also help these institutions provide the needs of various actors in the value chain. The government puts emphasis on the private sector mechanisms for the dairy sector and has done much to counter the pressure of big players to keep off the informal dealers from the market. The Kenya Dairy Board, established by national legislation, is mandated to efficiently and sustainably develop, promote and regulate the dairy industry. The Kibaki Commission actually abolished contracted milk quotas and opened up KCC to all farmers. Any perceived interference by GoK in the dairy sector (research, disease prevention and control, etc.) is pro-development of the sector rather than impeding its growth, and has thus not had distorting impact on the dairy market.

Commercial banks can cater to regional traders and exporters who need a higher volume of financial services, while MFIs and SACCOs cater to smaller-scale traders, local input suppliers, and producers (Schmitz, 2005). In principle, indirect value chain financing is more efficient than direct financing because lead firm have uses for the funds, which if invested in upgrading their firm, could further enhance the value chains competitiveness.
Therefore, value chain finance is generally most developed when there are linkages to external finance, usually from formal financial institutions (Financial sector deepening, Kenya, 2009).

Agricultural finance in broad terms includes funds to farmers, primary producers’, and providers of agricultural inputs, processors and other participants in the agricultural value chain. There are four sources of agricultural finance in Kenya, own funds that are funds generated by producers, suppliers and distributors from market oriented activities which are recycled within the agricultural sector, informal credit that is funds from friends, relatives and merchants money renders. This is not always given due emphasis because of lack of adequate documentation. However, it may probably be the most important source for many farmers as giving and asking for mutual assistance is a strong African tradition in Kenya (Von Pischke, 2003). Institutional credit that is funds made available as interest bearing loans and credit by the banking and parastatals and grants.

2.3 Constraints in Value Chains

The precise opportunities that financing can create within a chain are driven by the context as well as business model and also the relative roles of each particular participant in the chain. Porter’s value chain concept refers to the series of value created by a firm in terms of competitive advantage (1998). In the recent past development organization and practitioners are using the term value chain in a different perspective to address the activities, the actors, the stakeholders of a certain product or services from production (or farm) all the way through the various distribution points to the final consumers (Porter, 1998). In addition, indirect actors, service providers and enabling environments are part of the value chain analysis in this context.

While Porter’s value chain is emphasizing the competitiveness of a firm, the concept of value chain by development practitioners is focusing on the overall efficiency of a value chain for the betterment of all actors, with special emphasis to the rural poor communities, with equitable interrelationship among actors and service providers (Kaplinsky & Mike, 2002). Despite the changes in agriculture and agribusiness, the typical offer for financial products and services for agricultural and rural production has been deficient and not particularly innovative; financial intermediaries still lack much depth in rural areas, and producers, especially smallholders, are still underserved. Conventional thinking is that the agricultural sector is too costly and risky for lending.
Yet, major banks in the sector express the view that agricultural credit is profitable if producers are well integrated into a viable value chain (Shwedel, 2007; Martínez, 2006).

It is recognized that increases in finance and investment are needed at all levels of the food chain, with special interest in increasing the access to finance by those agricultural households and communities who are most vulnerable to food insecurity and poverty. As such, although this book deals with agribusinesses of all sizes and types, significant consideration is given to the effects on small farmers and small agribusinesses that have the most to gain or lose in today’s rapidly changing agricultural and economic environment. As stated by Campion (2006), finance often looks different when provided within a value chain than from a financial institution. Not only is the nature of the finance often different, but so are the motives. Nyoro (2007) notes that in Africa ‘value chain actors are driven more by desire to expand markets than by the profitability of the finance’. In Kenya in general dairy production has declined especially among the small scale farmers. In particular, production of milk has been on the decline both in volume and quality in many parts of Kenya.

2.3.1 Barriers and Challenges

African agriculture by and large suffers from major competitiveness constraints due to poor and, or missing infrastructure. This includes both road and rail way transport, storage facilities, the irrigation schemes, as well as access to power plus telecommunications. It is not just producers who are affected, save for also agribusiness. The extra cost incurred, together with the waste and delay by constant power interruptions and transport delays fundamentally reduce domestic competitiveness. Evidently an agricultural strategy ought to identify these gaps, although public finances are more stretched to make the required investments. Additionally, the public sector at times lacks the technical as well as the project management skills required so as to effectively deliver projects (Campion, 2006). Even more important than the operational costs for transacting a loan or securing investments is the systemic or correlated risk in agriculture. This risk stems from both price volatility as well as from changeable weather patterns that can affect whole regions at a time, making repayment uncertain.

Such investment is not only costly for individual value chain businesses, but can only be undertaken if there is an assurance from elsewhere in the chain for supplies, produce or markets. This creates the need to strengthen the links and commitment amongst value
chain players, often through contracts. Agricultural transformation in the globalizing marketplace therefore not only creates new challenges but also new opportunities for using that integration to increase competitiveness and access to finance. Since more finance for agriculture is critical in meeting this challenge, it is hoped that financial institutions and policymakers can learn from and also engage more with value chain actors so as to develop new products as well as reach new markets (Gonzalez-Vega, 2006).

In conventional lending, collateral is used to mitigate risks to the lender but the typical mortgage type of collateral commonly required by the banks is often not available or feasible in rural areas. This is due largely to land tenure restrictions and/or other requirements that are often designed to protect the livelihood assets of the community, but in doing so effectively limit their use as collateral. Hence, collateral is a major constraint to access to finance in agriculture not only from banks, but also from credit unions and other financing institutions. Central Bank policies can often exacerbate this constraint by requiring high reserves or imposing other restrictions which in effect penalize uncollateralized lending (Muiruri, 2007). Furthermore, the collapse of the global financial markets and ensuing caution for financing activities with unknown and/or uncontrollable risk has led to financiers and investors requiring more assurance of markets, prices and controls.

MSMEs in developing nations (especially in Africa, and to a slightly lesser degree in Asia) encounter a huge number of barriers as well as challenges that obstruct their ability to access finance. According to an October 2010 report released by the IFC and global consulting firm, McKinsey & Co., entitled “Two Trillion and Counting”, the total unmet need for credit for all MSMEs in emerging markets is $2.1 (Shepherd, 2004). In sub-Saharan Africa, in particular, where the majority of the lesser developed countries of the world exist; increasing access to inclusive finance for MSMEs is being recognized as a critical component of the effort to break the existing cycle of poverty. Incorporating the poor into the economic mainstream is recognized as the only sustainable way to advance development in the world’s poorest countries (Kula & Elisabeth, 2004).

Despite significant contribution of the dairy sector, agricultural financing in this sector is still not responsive to the needs of the dairy farmers. Dairy farmers are faced with a myriad of problems. Of importance is the seasonality in cash flows. There is variability in
production of milk determined by weather conditions. Also, farmers often require financing for capital investments for example herd improvement. A value chain analysis study conducted by OKURUT in 2004) established that In Nakuru, all value chain actors were profitable on average. Producers on average earn annual returns above 100%. This is because farmers in Nakuru have larger herd numbers compared to other areas.

![Nakuru Milk Shed Value Chain](image)

**Figure 1: Nakuru Milk Shed Value Chain**
**Source:** USAID report on Value chain analysis (2010).

### 2.3.2 Financing Gaps
Financing to agriculture has always been susceptible to political interests. In many instances, loans have been made for political motives, collection has been difficult due to the inability or reluctance to prosecute those unwilling to repay, and loans have been forgiven or granted moratoriums on repayment, all of which lead to an unwillingness to lend to agriculture. Value chain finance is less affected by loans being forgiven or politically dictated interest rates, since these are commonly embedded into the marketing contracts and payment is often secured by product. A healthy financial sector is one that which both high-quality universal along with the niche financial institutions can flourish by accessing reasonably price funding, as well as the risk management approaches they require to manage their balance sheet. The situation varies widely, for example, Kenya
has a well-developed inter-bank market amid the commercial banks. In spite of this, there is limited access to the market for successful rural and small co-operative banks.

Despite the profitability of the actors, the study established that there are financing gaps in the milk shed. Gaps exist as a result of inadequate financial products and services that meet the needs of the actors as well as poor access. For example, Dairy is a cash business with huge daily cash flows. Producers are required to buy feed and other supplies nearly on a working basis. There are also other costs such as labor and transport that are incurred by the producers (Skees, 2003). If producers have to travel fifty or more kilometers to access current accounts where they are paid for milk or their pay points then this presents a huge problem to the entire value chain. This is because inadequate access to cash for slow all other transactions in the value chain as input suppliers rely on producers for payment (Spiro, 2002).

In this case therefore value chain actors especially producers need a variety of services ranging from Savings or Credit facilities for Herd Improvement, structured savings and credit for income smoothing and payment services especially cash transfers. Thus, the problem of access to suitable financial services by dairy value chain actors/farmers remains the major problem affecting their production capacity and level (USAID, 2007). This research is expected to establish financial constraints, challenges, and opportunities experienced by rural producers, cooperatives and small traders working in the dairy sector in the context of value chain (USAID, 2007).

2.3.3 Lack of Agricultural Extension Expertise

The dairy industry has clearly been constrained in the past through a lack of agricultural extension expertise at the village level. Limited level of communication, technological transfer and implementation of basic research by the agencies is responsible for developing low cost but high quality animal inputs for the dairy industry. Although the country can produce milk competitively, this advantage is lost due to inefficiencies in milk collection, marketing and processing due to lack of government support and poor government policies. It suggests that in line with global trends in milk producing countries, the country should promote policies that enhance the use of economies of scale and size while streamlining the delivery of inputs and services to farmers (Financial Sector Deepening, Kenya, 2009).
Beynon et al, (1998) also identifies a number of policy and institutional issues that need to be addressed by various stakeholders in the industry in charting the way forward. These include measures to enhance productivity and competitiveness of production and institutional framework to safeguard and improve hygienic standards of the raw milk while charting the path to suitable development for the informal milk market. There are various government policies affecting milk production in Kenya including policy to protect farmer-supply from outside, policy on hygiene conditions, incentives for farmers (subsidies), free and subsidized training for farmers, funding to farmers e.g. micro financing, subsidized AI services (semen) and extension officers to train and guide.

There is little objective financial data on the small farm enterprise. This target market is too fragmented, diverse and nebulous to effectively apply traditional financial analysis techniques. In the long run, however, financial institutions will need much more concrete data with which to segment the market, develop products, and make lending decisions. Currently, many farmers only deal with a financial institution with a view to obtaining credit. The financial institution, therefore, only has one set of data on which to make decision. Farmers rarely open savings accounts voluntarily, and tend to operate their business on a cash basis. This also denies the financial institution the opportunity to cross-sell other products to improve the overall profitability of the customer (Jansen, 2007). Exacerbating the situation is that many financial institutions – particularly those smaller ones in rural areas – do not have the IT systems or analytical capacity to really extract the full value from customer transaction behavior.

2.3.4 Opportunities in Value Chain Financing
Improved business services to small- scale farmers and processors – whose have transaction costs that are largely relative to the size of their output help them improve quality and efficiency, including the reduction of costs, and expansion of operations. Each of the primary support activity has, as a result, the opportunity to contribute to the performance of the business unit by facilitating it to produce in the market as well as deliver products or services that meet or surpass the value expectations of the buyers in comparison with those from the other value chains. The growing demand for reasonably priced as well as high-quality dairy products has produced the incentive for the rapid strengthening and industrialization of animal production, thus representing social, economic and environmental impacts of global dimensions (Banda et al 2000). This
evolution brings forth all those involved in agricultural production, processing as well as marketing with a lot of interlinked problems in addition to challenges of far-reaching importance.

Practicality and validity of the collaborative value chain management models have been widely questioned (Cox et al., 2001), especially with regards to the existing asymmetry of power in the UK food sector in favor of the multiple retailers. Cox (2001) argues that collaboration is only possible in situations of buyer dominance or where power is equally distributed between buyer and seller to create interdependence. Nonetheless, Hingley (2005) contends that it is possible for the weaker links in the food chain to engage in fruitful collaboration with powerful supermarkets given that they accept the inherent power imbalance in the chain and strive to make themselves invaluable to their key customers (i.e. the large supermarkets).

Rewards are in staying ahead of the game by anticipating future retailer service requirements and conceding to the control of the retailers in the chain (Hingley, 2005). Support from the dairy industry is very important for the improvement of the milk cluster’s performance in the condition of giving technical as well as financial assistance, monitoring activities along with others. Therefore, an active input of the dairy industry in the undertaking is highly desirable not just for the milk cluster, but also the dairy industry itself, because this will ensure the continuous supply of high quality raw materials.

2.4 Policies in Value Chain Financing

Meeting the challenges of consumer trends and the demand for more processed or value added products requires increased investment in equipment, working capital, and skills and knowledge. Value chain finance holds many positive attributes. These include ease of access, flexibility, and risk mitigation, all of which can lead to the increased competitiveness of a sector. Accordingly, value chain finance connects the value chain actors involved in the process of production, trading, processing and retailing with financiers who have different financing products the various actors (Kalton, 1983). The Value chain finance framework has four main components. These are the Value chain context, the value chain supporters, the value chain actors and their financial relationship. The value chain context covers the overall economic environment (inflation, interest rate, economic growth, competition etc).
The constituting elements of an enabling environment in any given economy are multifaceted, covering themes such as the rule of law, public sector governance, overall macro-economic conditions, infrastructure and regulations affecting business, and socio-cultural context among others. Governments and international organizations are now paying increased attention to the assessment and promotion of reforms of enabling environments, having acknowledged that a conducive business climate is an essential pre-requisite for investments in new enterprises and for the sustained growth and competitiveness of the existing ones. The World Bank (2009) ‘Doing Business’ survey has been established as an authoritative benchmark in this area of concern, generating country rankings that have been instrumental in engendering business climate reforms worldwide.

The application of value chain finance depends upon the environment in which it operates. As with all finance, the starting point is to have the conditions for profitable business activity with some level of stability. Within finance, some financial instruments can only be applied if certain regulations or compliance is in place. Macro-economic instability or erratic policies adversely affect risk perceptions and undermine the potential of value chain financing instruments. Yet, at other times, value chain financing serves as a method of alternative finance when conditions for loans and services from conventional sources such as banks are not in place. For this reason the business models for value chains and their financing are developed according to the operating conditions and the characteristics of those involved in the chain. More often than not, work on building an enabling environment requires interventions on multiple levels in order to be effective (Cherogony, 2007).

Small producers in Africa have a poor record for repaying loans. Sometimes this is a result of catastrophic environmental or economic conditions which have reduced capacity to repay, but there are often other factors at play (Shwedel, 2007). Notwithstanding the many valid reasons for the discontinuation of the former governmental approach to integrated chains in agriculture used in Kenya, there are two important features to note. First, the ‘full-service’ approach and the stability of prices promoted growth in income and use of technology, albeit at high cost. It also provided security for lending and for marketing procurement. When these were no longer available with the discontinuation of the interlinked programme, the result was an increase in lending default and breach of sales contracts (side-selling).
2.4.1 Financing Policies
The value chain context matter may help in the value chain by creating conducive environment, transparent and stable macro-economic environment and the likes (Jansen, 2007). The chain supporters are the service providers like banks, microfinance institutions, insurance companies and transporters the financial services they provide include loans, pre-financing as well as savings (John, 1995). On the other hand, chain actors those directly involved in the production and sales of the product. For example farmers produce milk and sell it to their cooperative or to a trader. The cooperative or the trader transport/store the milk and sell to a like Brookside Dairy or KCC, the processor pasteurize some of the milk and convert some to other dairy products and sell to retailers (like Supermarkets and kiosks) and finally retailers sell to end consumers (Financial Sector Deepening, Kenya, 2009).

2.4.2 Marketing Policies
According to Kaplinsky and Mike (2002), one of the strengths of value chain development is that it considers the producer and product within the larger commercial context. Linking production to global markets and regional markets, commercialization has led to viewing producers as investment opportunities that are critical for development of the sector’s and country’s economic growth and competitiveness (Kaplinksy, 2002). According to the World Bank, “Africa’s potential in agriculture is largely untapped, but, with value chains often being unproductive and also uncompetitive. This is because of a number of environmental, economic and social factors. One of the main challenges is the lack of finance to fund the growth of agriculture in Africa.” On the back of this, the African governments, the commercial financial institutions as well as the international community have strengthened their efforts to close the gap existing.

2.4.3 Agricultural Frameworks
The Comprehensive Africa Agriculture Development Program (CAADP) has been endorsed by key stakeholders in agriculture as framework for contributing to the reduction of food insecurity and poverty in Africa and to contribute to the Millennium Development Goal (MDG) of halving poverty and hunger by 2015. CAADP distinguishes the Maputo Declaration on Agriculture along with the Food Security and the 10 percent national budget allocation to agriculture development as one of the methods that agriculture in the continent could be improved. The Declaration contains several key
decisions on agriculture, but major among them is the commitment to allocate at least 10 percent of the national budgetary resources to agriculture as well as the implementation of the rural development policy in five years. However, a review conducted by NEPAD in 2006 indicates that African countries are not complying with the Maputo declaration. The survey found that 50% of the countries spent less than 5% of their national expenditure on agriculture development.

According to Miller and Jones (2010), there are two ways through which value chain finance in agriculture may provide solutions to the above-mentioned dilemma. For bankers as well as financiers, value chain finance in agriculture is a move towards financing that uses an understanding of the production, marketing and value added processes to determine financial needs and how best to provide financing to the ones involved. By gaining understanding in matters of the agricultural chain, the lender is capable of making more informed decisions of how to arrange financing so as to reduce the costs as well as the short and longer-term risks involved such that financing becomes incentive. Funding can be done at several levels in the chain and could enter the chain at one point and after that flow up and/or down through the chain to others. For the smallholders, the value chain financing offers two added options to conventional financing ways (Yin, 2003). They may often get financing from other stakeholders in the chain, like from contract farming arrangements where the contracting buyer gives the funding in cash or kind.

2.4.4 Regulation Frameworks
Governments play an important function in setting the guiding principles for agriculture and agribusiness, as well as for the rules that govern finance. In value chain finance the product-related standards noted above must not only be set for countries and globally, they must be enforced in order to ensure transparency, consistency and compliance. Not only is the reputation of the product and the country’s product at stake, but there is also the need for consistency in order to provide the ability to trade effectively and co-mingle products. Standard sized bags or weights, standard grades and regulated processes for insuring safety, for instance, must be enforced in order for value chains to be efficient.

Regulation and enforcement are both a public and private issue. In many food sectors such as fruits and vegetables, private companies and their industry associations impose regulations which are much stricter than governmental ones, either to meet international
or supermarket requirements or to maintain a quality standard. They may also be in a position to enforce the regulations better than the state judicial system because of a mutual interest among partners in the chain to maintain good working relations for the future. In value chain financing arguably the most difficult area for regulation and enforcement is contract enforcement, which is critical for ensuring follow through of commitments. It is noted, for example, if farmers are allowed to break contracts and side-sell to outsiders when the price is better, or if buyers are allowed to renege on purchases (or provide other control barriers) when their price contracted is disadvantageous, then the systems fail and all in the chain are affected. In Uganda, for example, it was shown that ‘governance structures that encourage long-term interdependent relationships generally facilitate increased access to finance’ (Johnston & Meyer, 2008).

The same holds true for countries which can shut off imports and cause problems or even failure for those actors in value chains dependent upon their market. Banking regulation is often geared toward conventional, collateral-based lending and regulation that can address the less common forms of loan security such as product-based financing security. This is often lacking, thus limiting the use of some of the value chain financial products. Yet the required regulation can be developed. When considering the example of microfinance for which new regulation was developed, a similar expansion of regulation can be expected to meet the requirements of value chain financing.

Before 1992, no persons were permitted to sell raw milk in Kenya – everything was usually processed through KCC. But after liberalization, many farmers started sending their unpasteurized products straight to consumers at a highly reduced cost (Katz, 2002). Consequently, only 30% of Kenya’s milk is currently processed. The government has made attempts for years to bring many farmers back into the official market. But meanwhile, private processors are finding it difficult to invest in the additional processing capacity needed to produce products like the long-life UHT milk or butter and also cheese. There basically is inadequate domestic demand for such. However, without more investment in less perishable products, it will be quite difficult to offset glut-scarcity cycles.

Smallholders are also able to use their relationships such as formal contracts or established informal agreements, with strong partners in their chain(s), so as to secure bank funding that may not have been available then. Moreover, they can increase their
access to capital and growth (Coulter, 2002). Miller and Jones (2010) summarize this as, the flows of funds both internal and external financial arrangements among the various links in the chain. They refer this as value chain finance. Stated another way, it is any or all of the financial services, products and support services flowing to and/or through a value chain. This can be internal financing directly from one value chain participant to another or external from a financial institution or investor based upon the borrower’s value chain relations and activities (Fries & Banu, 2004).

Vision 2030 isolates agriculture as a key sector if the country is to realize the targeted average GDP growth rate of ten percent annually in the next 25 years. The ministry of agriculture in its strategic plan (GOK, 2005) the main objective is sustainable agriculture through the transformation of agriculture from subsistence farming to commercial orientation. Private sector development and agribusiness could play a major role in achieving this objective. However, the private sector seems to be ill prepared to take over the role of agricultural development and unfortunately the agribusiness is faced with financial constraints because of inaccessibility to credit facilities (Mullei et al, 1999).

The agribusiness sector would play a critical role in fostering entrepreneurship in agriculture through trade of agricultural produce, development of light and medium size industries to add value to these products and services. Studies by Tadora and World Bank revealed the importance of increasing the total output of food per given area of land, which only can be possible through fostering of entrepreneurial practice and adoption of innovations in agriculture, which increases the efficiency of production. This would in turn ensure food security and an increase in smallholder real incomes.

Small farmers require credit to purchase inputs for their farming. This is the most obvious reason for credit though it goes further than that as the easiest form of credit for small farmers are from merchants. They provide the inputs on credit as well as purchase the outputs quickly for cash. These are actually simple and also low cost transactions for farmers but indeed the hidden costs can be considerable. Cash buyers are free to seek better discounts on purchases more than those who seek out to delay their payments till after the harvest or after the lambs are sold. Selling directly after harvest due to financial needs may lead to a low sale price. Although merchants are generally seen as the problem, farmers can suffer the same impacts from their cooperatives. Merchants are as well good at providing small amounts of credit for their purchases.
The unavailability of financial resources to farmers in the developing countries is one of the major constraints to increase farm production. The importance of agricultural credits, especially from the institutional sources, is widely recognized as affective tool to enhance agricultural productivity. Agriculture financing has developed a marked dependence on the rediscount window of the Central Bank of Kenya (CBK) to a much larger extent than the non-agricultural sector. In the absence of agricultural credit food security both at the household and national level is threatened, as access to agricultural factors of production is limited (GOK, 2004). Empirical analysis of agricultural credit has been of key scientific and political interest in recent years.

Based on a common analytical framework entailing a formal model of a credit rationed farm household, the methods are subjected to a comparative evaluation of their specific strengths or shortcomings. Six approaches are distinguished: measurement of loan transaction costs, analysis of qualitative information collected in interviews, analysis of quantitative information collected in interviews by using the credit limit concept, analysis of spill-over effects with regard to secondary credit sources, econometric household modeling, and the econometric analysis of dynamic investment decisions.

2.5 Chapter summary

This chapter has mainly review of the literature on access to finance by agricultural value chains with a bias to developing countries such as Kenya. Emphasis have been concentrated on literature on the concept of value chains and their application in development, importance and constraints of value chains, framework of value chain finance and ways of improving access to financial services (Fries & Annica, 2005). Value-chain development is impossible without adequately functioning financial institutions to provide funding for investment and business operations across the various segments. Specific segments have different needs and capacities to access finance. The pillar agenda can build on the various types of financial institutions, ranging from commercial banks to group based savings organizations such as rotating savings and credit associations (ROSCAs).

Financial institutions in most African countries, in particular commercial banks but also microfinance institutions, in general lack the skills to assess and manage risk related to lending to agricultural production, processing, and related enterprises (AREs). These constraints not only limit absolute access, but also add to the cost of credit. AREs,
conversely, lack the knowledge or skills to produce accurate information presented openly and transparently.
CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction
This section describes the methodology to be used in the study and is organized under the following subheading: Geographical area; study design; target population; sample and sampling design; methods of data collection data analysis techniques. The section also describes methods to be implemented to maintain validity and reliability of the instrument.

3.2 Research Design
Research design can be described as the structure of research (Cooper and Schindler, 2003). It is the strategy, plan, and the structure of conducting research. Research design is used to structure the research, to show how all the major parts of the research project are fitted together. A descriptive survey design was used. Descriptive research design is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way. Descriptive research does not fit neatly into the definition of either quantitative or qualitative research methodologies, but instead it can utilize elements of both, often within the same study. For this survey, both approaches were be used. According to Cooper and Schindler (2006) a survey obtains information from a sample of people by means of self-report, that is, people responds to a series of questions posed by an investigator.

In this study, a descriptive survey design was preferred because it provided a general account of the characteristics of respondents, for example behavior, opinion and knowledge of a particular situation. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection (Mugenda and Mugenda, 2003). The underlining concept is to select several targeted cases where an intensive analysis identified the possible alternatives for solving the research questions on the basis of the existing solution applied in the selected case study. The researcher used visual aids such as graphs and charts to aid in understanding the data distribution.

3.3 Population and Sample
3.3.1 Target Population
Target population refers to a group of people (or anything else) that interests a researcher (Creswell, 2009). A population is a collection of data whose properties are analyzed. A
population is a well-defined set of people, services, elements, and events, group of things or households that are being investigated. The population is the complete collection to be studied; it contains all subjects of interest. The survey population includes only those who will potentially be included in the sample. According to the Kenya National Bureau of Statistics, 2009 Nakuru has a total population of 1,603,325 out of which approximately 3094 comprises of the dairy farmers. As such the target population of this study comprised of 3094 respondents who were the dairy farmers spread across the four districts in the County including Nakuru, Nakuru North, Naivasha and Molo. Nakuru was chosen for the study because of the large number of actors involved, especially at the level of producers and traders.

Nakuru milk shed was purposively selected because farming system in the county are characterized by wide range of dairy production systems. These include commercial large scale and small-scale dairy producers. Further, Nakuru is one of the key milk producing areas in Kenya. It has one of the largest milk shed in Kenya involving a wide range of actors. The selection of Nakuru was therefore informed by the ability of the researcher to collect information from a representative sample within the set time frame time. The location was selected based on convenience and involvement of rural and peri-urban community. The demographics of the county are as described below.

Table 1: Target Population

<table>
<thead>
<tr>
<th>Geographical Area</th>
<th>Population Frequency</th>
<th>Sample Size (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nakuru district</td>
<td>973</td>
<td>31.4</td>
</tr>
<tr>
<td>Nakuru North district</td>
<td>721</td>
<td>23.3</td>
</tr>
<tr>
<td>Naivasha district</td>
<td>574</td>
<td>18.6</td>
</tr>
<tr>
<td>Molo district</td>
<td>826</td>
<td>26.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3094</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


**3.3.2 Sample Design and Sample Size**

Sample design is the process by which the researcher chooses the part of the population that will be included in the survey. To be useful, sampling must be a rigorous and thoroughly considered aspect of the research design. As useful as sampling is, a poorly designed sample may result in inaccurate survey results. Therefore, as Creswell (2009)
notes, anyone attempting to conduct a survey of any sort should pay ample attention to their sampling.

A sample is a part of the population of interest, a sub-collection selected from a population. A sample is a scientifically drawn group that actually possesses the same characteristics as the population. In statistics and survey methodology, sampling is concerned with the selection of a subset of individuals from within a population to estimate characteristics of the whole population. Simple random sampling was used to select respondents for the study from the list of eligible groups of actors.

Simple random sampling is a sampling technique whereby each of the units in the sampling frame has the same chance of being selected for the survey (Polit et al., 2001). Randomly drawn samples must have two characteristics: Every person has an equal opportunity to be selected for your sample; and Selection of one person is independent of the selection of another person. The advantage of simple random sampling is that it is simple and easy to apply when small populations are involved. However, because every person or item in a population has to be listed before the corresponding random numbers can be read, this method is very cumbersome to use for large populations (Australian Bureau of Statistics, 2006).

3.3.3 Sample Frame

According to Wallen and Fraenkel (2001), an ideal sample should be large enough so that the investigator can be confident with specified limits, be certain that a different sample of the same size, if drawn using the same procedure can give approximately similar result. In order to properly collect key data underpinning the analysis of the dairy value chain a statistically significant sampling strategy will be developed based on the Central Limit theory which states that the conditions under which the sum of a sufficiently large number of independent random variables, each with finite mean and variance, will be approximately normally distributed (John, 1995).

The sample size depends on three properties of the study namely; (a) the complexity of the characteristics under study (the number of categories used to measure it), (b) the precision required to approach these characteristics, and (c) the resources available. The researcher sought to sample a total of 354 out of 3094 dairy farmers from 4 cooperatives in the county of Nakuru. For stratified random sampling, the sample size was determined
on the basis of those variables in the sample that were likely to have the greatest variability and where the likely proportion was not known, it was assumed that 50% of the sample had the specified attribute. The sample was determined statistically using the equation below.

The sample size was given by:

\[ n = p \times q \times \left( \frac{z}{e} \right)^2 \]

Where: 
- \( n \) = was minimum sample size required
- \( p \) = the proportion belonging to the specified category
- \( q \) = the proportion not belonging to the specified category
- \( z \) = the value corresponding to the level of confidence required (90% certain=1.65, 95% certain= 1.96 and 99% certain=2.57)
- \( e \) = the degree of variability in the sample (0.5 is maximum and lowest risk)
- \( e\% \) = the margin of error required.

When the population is less than 10,000 the sample need to be adjusted according to minimum sample size formula as shown below:

\[ n'.= \frac{n}{1+n/N} \] where
- \( n' \) = the adjusted minimum sample size
- \( n \) = the minimum sample size (as calculated)
- \( N \) = the total population

Using:
- \( p=50\% \), \( q=50\% \), \( z=1.96 \) (95% certain) \( e= 5\% \) (i.e. within plus or minus 5% of the true percentage, the margin of error that can be tolerated), \( N=3094 \)

\[ n. = 50\times50 \times [1.96/5]^2 \]
\[ = 2500\times 0.153664 \]
\[ = 384 \]

Adjusted sample size

\[ n'.= \frac{384}{1+ (384/3094)} \]
\[ = 384/2.92 \]
\[ = 354 \]

Approx. = 354
Table 2: Sample Size

<table>
<thead>
<tr>
<th>Geographical Area</th>
<th>Population (Frequency)</th>
<th>Proportion</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nakuru district</td>
<td>973</td>
<td>(354/3094)*973</td>
<td>111</td>
</tr>
<tr>
<td>Nakuru North district</td>
<td>721</td>
<td>(354/3094)*721</td>
<td>82</td>
</tr>
<tr>
<td>Naivasha district</td>
<td>574</td>
<td>(354/3094)*574</td>
<td>66</td>
</tr>
<tr>
<td>Molo district</td>
<td>826</td>
<td>(354/3094)*826</td>
<td>95</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3094</strong></td>
<td></td>
<td><strong>354</strong></td>
</tr>
</tbody>
</table>

Source: Author (2013)

3.3.5 Data collection

A questionnaire was be used as a data collection instrument. A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. Questionnaires have advantages over some other types of surveys in that they are cheap, do not require as much effort from the questioner as verbal or telephone surveys, and often have standardized answers that make it simple to compile data. The study also adopted document reviews and discussions.

The questionnaire contains questions aimed at eliciting responses from respondents that are of use to this study. To enhance uniformity the researcher mostly used closed ended questions in the questionnaire. However, open ended questions were used where closed ended questions could not apply. The researcher had selected the questionnaires as the preferred quantitative method of data collection due to their ease of use and questions designed to produce answers that can be scored, eventually offering a summed measure of the respondent’s attitudes and opinions.

3.4 Pilot Test

Prior to the actual study, the researcher carried out a pilot study to pretest the validity and reliability of data collected using the questionnaire. According to Macky & Gass (2009) the point of carrying out a pilot study is to test-often to revise and finalize the materials and the methods. An instrument is valid if it measures what it is intended to measure and accurately achieves the purpose for which it was designed (Creswell, 2008). Creswell (2009) emphasizes that validity is a matter of degree and discussion should focus on how valid a test is, not whether it is valid or not. According to Creswell (2005), no test instrument is perfectly valid. The researcher needs some kind of assurance that the instrument being used will result in accurate conclusions. Validity involves the
appropriateness, meaningfulness, and usefulness of inferences made by the researcher on the basis of the data collected. Validity can often be thought of as judgmental. Validity is determined by judgments on the appropriateness of the instrument’s content.

Reliability on the other hand refers to the consistency of measurement and is frequently assessed using the test–retest reliability method. Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals and by using uniform testing procedures. Nunnally (1978) stated that reliability of a research instrument can be indicated at a minimal Alpha value of 0.6. To measure the reliability of the data collection instruments the study will select a pilot group of 10 individuals from the target population at Equatorial Commercial (Mugenda & Mugenda, 2003). The research utilized the Cronbach’s alpha of 0.70 to check internal reliability; the higher the alpha, the more reliable the research instrument (Mugenda and Mugenda, 2003).

To enhance the validity and reliability of the questionnaire, a pre-test (pilot study) was conducted on a population similar to the target population. This enabled the researcher to eliminate bias and ambiguity. The researcher selected a pilot group of 10 individuals from the target sample of the stakeholders involved in the dairy value chain financing to test the reliability of the research instrument. This was randomly chosen, interviewed and analysis was done to test whether the research tools are valid. The pilot study allowed for pre-testing of the research instrument. The clarity of the instrument items to the respondents is necessary so as to enhance the instrument’s validity and reliability. The aim was to correct inconsistencies arising from the instruments, which ensured that they measure what is intended. The pilot data was not included in the actual study.

3.4 Research Procedures
The study made use of a pre-tested survey questionnaire administered to each member of the sample population. The study administered the questionnaire individually to all respondents of the study. The study exercised care and control to ensure all questionnaires issued to the respondents were received and to achieve this, the study maintained a register of questionnaires, which were sent, and which were received. The questionnaire were administered using a drop and pick method.
3.5 Data Analysis

Qualitative and quantitative techniques were used to analyze the data. Qualitative methods involve the analysis and triangulation of the interview guides and evaluation of the text material. Quantitative data was analyzed using frequencies, percentages and means. The purpose of descriptive statistics is to enable the researcher to meaningfully describe a distribution of scores or measurements using a few indices or statistics (Mugenda & Mugenda, 2003). Analysis also included drawing conclusions and verifications, where data irregularities, explanations and causal flaws were discussed if any. Quantitative data from structured questionnaires was edited for completeness and consistency before processing. Results from the analysis are presented in tables, charts and bar graphs.

In addition, the researcher conducted a multiple regression analysis so as to determine the challenges and opportunities in the financing of agricultural value chain in Kenya and specifically in the dairy subsector. The regression equation \( Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon \): Whereby

\( Y \) = Access to financial services
\( X_1 \) = Gender
\( X_2 \) = Age
\( X_3 \) = Level of income
\( X_4 \) = Reason for venturing into the dairy sector

The study further conducted the Chi squares test where the various parameters and statistics regarding the reason for venturing into the dairy sector, level of income, age and gender were investigated in terms of strength and validity in influencing the outcomes for the realization of the study objectives.

3.6 Chapter Summary

Chapter three offers an insight on how the researcher intends to conduct research and collect data from the field. It shows how data will be collected, using what instruments and how data will be analyzed. This chapter is a pre-requisite to chapter four (presentation of results) as it offers the research an opportunity to underline his research framework and offer his results creditworthiness.
CHAPTER 4: RESULTS AND FINDINGS

4.1 Introduction
This chapter presents the findings from data collected through the use of questionnaires and by personal observations by the researcher in the study region. Respondents involved in the dairy sub-sector filled the questionnaires. The information gathered has been analyzed using the statistical package for social science (SPSS 19.0), presented and discussed as per the objectives of these study.

4.2 General Information
This section concerns itself with outlining and presentation of the findings obtained from the questionnaires distributed to the respondents. For clarity of the information, it was necessary for a review of the responses to ascertain that the information from the respondents was adequate and complete for purposes of the research. The analysis of the general information is presented in this section under gender, age, experience, years and highest formal qualification.

4.2.1 Distribution of the Respondents by Gender
In this study the respondents sampled were expected to comprise both male and female respondents. Study findings show that 75% of the respondents who participated in the study were women while the remaining 25% were men.

4.2.2 Distribution of the Respondents by Age
The research findings indicate that 6% of the respondents were below 30 years of age while 44% fell between ages 30-40. Forty one percent (41%) of the respondents were between 41-50 years while the remaining 10% were 51 and above years old. The Figure 2 below summarizes the findings.
4.2.3 Level of Education

The dairy farming sub-sector draws people from different socio-economic background hence different academic qualifications. This difference might contribute to differences in the responses given by the respondents. According to the study, 45.8% of the respondents had gone through the primary school education. Those with secondary school education were indicated by 33.5% of the responses. Those with university or college education were only 2% while the remaining 18.9% had no education at all. During the study, it was observed that the more educated entrepreneurs are able to comprehend lending rules the better. The graph below summarizes the findings.

Figure 3: Level of Education
The study found out that 95% of the respondents were married while 4% were single. The remaining 1% was composed of widows.

4.2.4 Experience in Dairy Farming

From the study, an overwhelming majority (61.0%) of the respondents reiterated that they had been involved in farming or dairy farming business for a period of between 11 and 15 years, 15.8% of them indicated that they had an experience of between 6 and 10 years, 14.7% if they had 1 to 5 years of experience, 4.8% had 16 years to 20 years of experience while 3.7% of the respondents had over 20 years of farming or dairy farming business experience. This shows that majority respondents had enough work experience in oil firms. The respondents are conversant with determinants of factors influencing petroleum exploration in Kenya.

<table>
<thead>
<tr>
<th>Length/Experience</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>52</td>
<td>14.7</td>
<td>14.7</td>
<td>14.7</td>
</tr>
<tr>
<td>6-10</td>
<td>56</td>
<td>15.8</td>
<td>15.8</td>
<td>30.5</td>
</tr>
<tr>
<td>11-15</td>
<td>216</td>
<td>61.0</td>
<td>61.0</td>
<td>91.5</td>
</tr>
<tr>
<td>16-20</td>
<td>17</td>
<td>4.8</td>
<td>4.8</td>
<td>96.3</td>
</tr>
<tr>
<td>over 20 years</td>
<td>13</td>
<td>3.7</td>
<td>3.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>354</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

4.2.5 Reasons for Venturing into Dairy Farming

Figure 4 below shows that 90% of the respondents ventured in dairy sector for commercial reasons. This implies that the majority of the farmers were engaging in dairy for commercial purposes rather than for subsistence. In this case, it is assumed that majority of them will have sought a financial service of one kind or the other. Analysis also shows that 7% engaged in the sector for traditional reasons. This group was mainly composed of agro-pastoralist who had shifted from pure pastoralism to agro pastoralism. The remaining 3% was composed of those who ventured into the sector for both commercial and traditional reasons. This could imply that some respondents drawn from Nakuru and its surrounding practice dairy farming not only because it is the traditional livelihood but with time also do it for commercial reasons. Many communities around Nakuru are pastoralists.
4.3 Financial Services
In order for the study to achieve its main objective the first specific objective of the study was to establish the core financial activities and services rendered to small-scale dairy farmers in Nakuru Milk shed by the financial services providers.

4.3.1 Access to Finance Services
In this regard the respondents were required to indicate whether they ever looked for financial services. An overwhelming majority (shown by 99.7%) of the respondents confirmed that they had sought for financial services, as compared to 0.3% of those who indicated otherwise.

Table 4: Whether the Respondents had ever sought for Financial Services

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>353</td>
<td>99.7</td>
<td>99.7</td>
<td>99.7</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>0.3</td>
<td>0.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>354</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Study findings indicate that all the respondents sought various financial services from banks, MFIs and SACCOs in Nakuru. Further analysis showed that 30.5% sought credit services while 28.5% sought both banking/saving and credit services. Those who sought for banking services only were 11% while 4.5% sought for insurance services. A minority of 1.1% sought hedging services. Figure 5 below summarizes the findings.
Majority (14.3%) of the respondents who sought for loan/credit services were aged between 30-40 years, those who sought banking/saving and credit services comprised of a majority drawn from 30-40 year olds, banking services were mainly sought by people aged between 41-50 years while insurance services and hedging services are mainly sought by people who are within the ranges of 41-50 years and 51 years and above.

Table 5: Cross-tabulation of Financial Services Sought Against Age

<table>
<thead>
<tr>
<th>Service</th>
<th>Less than 30 years</th>
<th>30-40 years</th>
<th>41-50 years</th>
<th>51 years and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan/credit services</td>
<td>1.3</td>
<td>14.3</td>
<td>13.4</td>
<td>1.5</td>
<td>30.5</td>
</tr>
<tr>
<td>Banking/saving and credit services</td>
<td>1.1</td>
<td>13.7</td>
<td>12.4</td>
<td>1.3</td>
<td>28.5</td>
</tr>
<tr>
<td>Banking services</td>
<td>1.3</td>
<td>3.3</td>
<td>4.2</td>
<td>1.7</td>
<td>11</td>
</tr>
<tr>
<td>Insurance services</td>
<td>1.7</td>
<td>0.3</td>
<td>1.1</td>
<td>1.4</td>
<td>4.5</td>
</tr>
<tr>
<td>Hedging services</td>
<td>0</td>
<td>0</td>
<td>0.9</td>
<td>1.6</td>
<td>1.1</td>
</tr>
<tr>
<td>Others</td>
<td>0.7</td>
<td>11.4</td>
<td>9.8</td>
<td>2.5</td>
<td>24.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
<td><strong>43</strong></td>
<td><strong>41</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The cross tabulation of level of education against the financial services sought from the financial service providers indicate that majority (45.8% and 33.3%) of the respondents who sought for the various services had acquired some levels of education, that is, primary and secondary education levels.
Table 6: Cross-tabulation of Financial Services Sought against Level of Education

<table>
<thead>
<tr>
<th>Service</th>
<th>No education</th>
<th>Primary</th>
<th>Secondary</th>
<th>University/ college</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan/credit services</td>
<td>4.8</td>
<td>15</td>
<td>9.4</td>
<td>1.3</td>
<td>30.5</td>
</tr>
<tr>
<td>Banking/saving and credit services</td>
<td>6.1</td>
<td>14.2</td>
<td>8.1</td>
<td>0.1</td>
<td>28.5</td>
</tr>
<tr>
<td>Banking services</td>
<td>1.8</td>
<td>3.1</td>
<td>5.9</td>
<td>0.2</td>
<td>11</td>
</tr>
<tr>
<td>Insurance services</td>
<td>0.3</td>
<td>2.3</td>
<td>1.9</td>
<td>0</td>
<td>4.5</td>
</tr>
<tr>
<td>Hedging services</td>
<td>0.8</td>
<td>0</td>
<td>0</td>
<td>0.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Others</td>
<td>5.1</td>
<td>11.2</td>
<td>8</td>
<td>0.1</td>
<td>24.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18.9</strong></td>
<td><strong>45.8</strong></td>
<td><strong>33.3</strong></td>
<td><strong>2</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The study conducted a cross tabulation of the financial services sought against reasons for venturing to farming and established that majority of the respondents that sought for various financial services had ventured into farming for commercial reasons.

Table 7: Cross-tabulation of Financial Services and Reasons for Dairy farming

<table>
<thead>
<tr>
<th>Service</th>
<th>Commercial reasons</th>
<th>Commercial and traditional reasons</th>
<th>Traditional reasons</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan/credit services</td>
<td>28.1</td>
<td>0.2</td>
<td>2.2</td>
<td>30.5</td>
</tr>
<tr>
<td>Banking/saving and credit services</td>
<td>27.4</td>
<td>0.1</td>
<td>1</td>
<td>28.5</td>
</tr>
<tr>
<td>Banking services</td>
<td>9.3</td>
<td></td>
<td>1.7</td>
<td>11</td>
</tr>
<tr>
<td>Insurance services</td>
<td>3.1</td>
<td>1</td>
<td>0.4</td>
<td>4.5</td>
</tr>
<tr>
<td>Hedging services</td>
<td>1.0</td>
<td>0</td>
<td>0.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Others</td>
<td>21.1</td>
<td>1.7</td>
<td>1.6</td>
<td>24.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td><strong>3</strong></td>
<td><strong>7</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The cross tabulation of years farming against the financial services sought from the financial service providers indicate that majority (28.5%) of the respondents who sought for the various services had a farming experience of over 20 years, followed by those with 16 – 20 years of experience in farming (28.0%), then respondents with farming experience of 1-5 years (22.1%) and finally those with 11-15 years of farming experience (21.4%). It is worth noting that the number of people seeking loan/credit services, banking/saving and credit services and banking services increases with increased farming experience while that of insurance and hedging service seekers increase with the decreasing experience. This could be attributed to the fact that new customers who seek
financial services could be much aware of the insurance and hedging concepts as compared to those who have been in the farming business for a long time.

Table 8: Cross-tabulation of Financial Services against Farming Experience

<table>
<thead>
<tr>
<th>Service</th>
<th>1-5 yrs</th>
<th>11-15 yrs</th>
<th>16-20 yrs</th>
<th>Over 20 yrs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan/credit services</td>
<td>5.3</td>
<td>5.8</td>
<td>8.2</td>
<td>11.2</td>
<td>30.5</td>
</tr>
<tr>
<td>Banking/saving and credit services</td>
<td>5.6</td>
<td>6.6</td>
<td>8.0</td>
<td>8.3</td>
<td>28.5</td>
</tr>
<tr>
<td>Banking services</td>
<td>1.4</td>
<td>2.3</td>
<td>3.2</td>
<td>4.1</td>
<td>11.1</td>
</tr>
<tr>
<td>Insurance services</td>
<td>2.2</td>
<td>1.1</td>
<td>0.8</td>
<td>0.4</td>
<td>4.5</td>
</tr>
<tr>
<td>Hedging services</td>
<td>0.5</td>
<td>0.3</td>
<td>0.2</td>
<td>0.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Others</td>
<td>7.1</td>
<td>5.3</td>
<td>7.6</td>
<td>4.4</td>
<td>24.4</td>
</tr>
<tr>
<td>Total</td>
<td>22.1</td>
<td>21.4</td>
<td>28.0</td>
<td>28.5</td>
<td>100</td>
</tr>
</tbody>
</table>

The proximity of the financial institution to their customers is an important consideration in choosing the suitable service provider. Nevertheless, findings from this research suggest that this not a major barrier as indicated by 32% and 30% of the respondents who disagreed or strongly disagreed with the view that the location of the banks hinder access respectively. Analysis also shows that 9% rated neutral while 8% agreed with the view. Those who rated strongly agreed represented 21% of the sample. From the analysis above, one could conclude that modern electronic banking, mobile banking and agency banking has made banks more accessible. The graph below summarizes the findings.

![Figure 6: Rating on Proximity of Financial Institutions to the Clients](image)

4.3.2 Cost of Outputs

On whether the respondents had training on financial management, 61.3% of the respondents recapped that they didn’t have training on financial management, while
38.7% of them had training on financial management. As the farmers set the prices they would like to ensure that their sales process cover for all the costs incurred in the production of the milk up to the point of sale. Labour is one such cost that must be considered and therefore as confirmed by the survey, cost of labour contributes to the price of the milk.

Table 9: Training on Financial Management

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>137</td>
<td>38.7</td>
</tr>
<tr>
<td>No</td>
<td>217</td>
<td>61.3</td>
</tr>
<tr>
<td>Total</td>
<td>354</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.3.3 Regulation of Financing

Research findings showed that the respondents remained divided on effects of having loan security on access to financial services. A cumulative percentage of 50% rated strongly disagreed, disagreed and neutral while the remaining cumulative percentage of 50% rated agreed and strongly agreed. This could be explained by liberalization of the banking industry that has enable banks to have flexible security demands on borrowers. The figure below summarizes the findings

Figure 7: Rating on Credit Security
4.3.4 Financing Institutions

The study also sought to establish the sources from where the respondents financed their businesses. According to the results depicted in Table 10, 59.9% of the respondents recapped that they financed their businesses from their saving, 17.8% of them indicated savings & microfinance institutions, 5.9% of the respondents finance their businesses from savings & commercial banks, another 5.6% of them indicated co-operative unions, 5.1% finance their businesses from commercial banks, 3.7% seek business finance from savings, co-operatives unions & co-operative unions, while 0.3% of them seek finance for their businesses from microfinance institutions.

<table>
<thead>
<tr>
<th>Source of Finances</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saving</td>
<td>212</td>
<td>59.9</td>
</tr>
<tr>
<td>Commercial Banks</td>
<td>18</td>
<td>5.1</td>
</tr>
<tr>
<td>Microfinance institutions</td>
<td>1</td>
<td>.3</td>
</tr>
<tr>
<td>Co-operative unions</td>
<td>20</td>
<td>5.6</td>
</tr>
<tr>
<td>Savings &amp; microfinance institutions</td>
<td>63</td>
<td>17.8</td>
</tr>
<tr>
<td>Savings &amp; commercial banks</td>
<td>21</td>
<td>5.9</td>
</tr>
<tr>
<td>Savings, co-operatives unions &amp; co-operative unions</td>
<td>13</td>
<td>3.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>354</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The study further sought to establish whether the respondents were members of co-operative societies. Accordingly, 73.2% of them unanimously agreed that they were co-operative societies while 26.8% of them were not.

4.4 Challenges Faced in the Dairy Value Chain and Opportunities Available

The second objective of the study was to establish the major constraints in the dairy value chain and opportunities available financial services providers in provisions of financing services to the Dairy sector.

4.4.1 Barriers and Challenges

Study findings indicate that lack of finances remains a major obstacle to business growth as indicated by 57.3% of the respondents. Lack of market for products and management constraints was cited as a major obstacle by 24.9%. The other reasons given by farmers include 6.5% of the respondents who cited lack of markets for products only. Both lack of
finances and management constraints were mentioned by 5.6% while 4.5% of the respondents cited lack of management skills as the major challenge.

![Figure 8: Challenges Faced in Expanding the Business](image)

On whether the respondents faced any challenges in getting financial services, findings showed that 92% faced challenges while 8% did not. It was assumed that the challenges faced resulted in poor credit which in turn culminated in poor access to loan facilities. This is summarized in Figure 9 below.

![Figure 9: Whether Respondents Face Challenges When Seeking Credit](image)
On kind of challenges faced, findings showed that 16% of the respondents cited from a combination of high interest rates and lack of collateral. Over 38% of the respondents cited high interest rates, also indicated they lacked loan security and information about credit products. Lack of information on available products challenged 7% of the respondents while 5% suffered from products not meeting their needs. Short repayment period hampered 1% while the remaining 1% cited from a combination of high interests, lack of collateral and short loan repayment period. Figure 10 summarizes the findings.

The findings are consistent with a regime of high interest rates charged by financial institutions in Kenya. It is not clear however why this is still a problem to members who belong to a cooperative. The issue is noted by over two thirds of the respondents who indicate that lack of information, collateral and lack of information is a key challenge. The basis of a cooperative is it is therefore supposed to offer better services. But according to WOCCU (2009a), this has not been the issue because of mismanagement. Consistent with these facts, is the need to seek financial services outside the cooperatives as shared during interviews with respondents.

**Figure 10: Challenges faced When Seeking Credit**

### 4.4.2 Financing Gaps

On whether the financial institutions ever refused financial services, 55.1% of the respondents recapped that they had never been refused financial services by the financial institutions, while 44.9% of them had been refused financial services by the financial
institutions. The respondents indicated that they were denied financial services which include loan, insurance service and hedging services.

Table 11: Whether the Financial Institutions Refused Financial Services

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>159</td>
<td>44.9</td>
</tr>
<tr>
<td>No</td>
<td>195</td>
<td>55.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>354</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The study further sought to establish whether the respondents take insurance for their products. From the results shown in Table 12, 88.4% of the respondents do not take insurance for their products as compared to 11.6% of those who indicated that they take insurance for their products. It is clear that majority of the respondents do not take insurance for their products. This is mainly because insurance is costly. Other reasons include lack of information on insurance products and lack of need for insurance.

Table 12: Taking of Insurance for Products

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>41</td>
<td>11.6</td>
</tr>
<tr>
<td>No</td>
<td>313</td>
<td>88.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>354</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

In the dairy sector, farmers are barred from accessing financial services by various issues such as high interest rates, lack of collateral among others. Research findings show that 48% respondents earned between Ksh.20,000 and 40,000. This is indicative of why majority of them (20%) strongly agreed that high transaction cost was very key in access to credit. It is also evident from the same group that for those with an income of Ksh.80,000 and above, only a few (2%) strongly agreed with the rating. They could be attributed to the amount money they required as credit and the cost associated. Its notable that at all levels of income, 14% of the responded rated strongly disagree with the issue of high transaction cost. Majority of them (6%) earned Ksh.20,000-40,000 and one could pose that these group only transacted less often or in small amount or required small amount in credit most of the time. From the above analysis, one could perhaps conclude that high
transaction costs remain an obstacle to accessing financial services. The table below summarizes the findings.

### Table 13: Level of Monthly Income

<table>
<thead>
<tr>
<th>Level of monthly income in Ksh.</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20,000 - 40,000</td>
<td>6%</td>
<td>10%</td>
<td>3%</td>
<td>9%</td>
<td>20%</td>
<td>48%</td>
</tr>
<tr>
<td>40,000 – 60,000</td>
<td>4%</td>
<td>5%</td>
<td>1%</td>
<td>4%</td>
<td>10%</td>
<td>23%</td>
</tr>
<tr>
<td>60,000 – 80,000</td>
<td>3%</td>
<td>5%</td>
<td>1%</td>
<td>5%</td>
<td>10%</td>
<td>24%</td>
</tr>
<tr>
<td>80,000-100,000</td>
<td>1%</td>
<td>1%</td>
<td></td>
<td></td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>Over 100,000</td>
<td></td>
<td></td>
<td>1%</td>
<td>1%</td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td>All Levels of Income</td>
<td>14%</td>
<td>22%</td>
<td>5%</td>
<td>18%</td>
<td>42%</td>
<td>100%</td>
</tr>
</tbody>
</table>

As indicated by a cumulative percentage of 51.7% of the respondents, most respondents lack enough information on financial services to make the right decision. Twenty five percent (25.4%) strongly disagreed with the view while 14.7% disagreed. Nineteen percent (19.2%) held a neutral view while 17.5% agreed with the view. The remaining 23.2% strongly agreed that they did not have adequate information on financial services offered to make the right decision. This fact could be explained by the fact that about two thirds of those sampled received up to primary education. Financial literacy as well as financial requirements and conditions may be difficult for these people to decipher. The Figure below summarizes the findings.
According to the study, loan requirements don’t necessarily hinder customers from accessing services. This view was shared by 18.6%, 20.3% and 20.6% of the respondents who rated strongly disagree, disagree and neutral in that order. However, 13.8% of the respondents agreed that loan requirement hindered access to financial services while 26.6% supported the view very strongly. The table below summarizes the finding.

**Table 14: Loan Requirements don’t Hinder Customers from Accessing Services**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>66</td>
<td>18.6</td>
<td>18.6</td>
<td>18.6</td>
</tr>
<tr>
<td>Disagree</td>
<td>72</td>
<td>20.3</td>
<td>20.3</td>
<td>39.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>73</td>
<td>20.6</td>
<td>20.6</td>
<td>59.6</td>
</tr>
<tr>
<td>Agree</td>
<td>49</td>
<td>13.8</td>
<td>13.8</td>
<td>73.4</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>94</td>
<td>26.6</td>
<td>26.6</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>354</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

This Research found out that 19.2% of the respondents strongly agreed with the view that inability of the financial products to meet their needs was the main barrier in accessing financial services. An additional 13.6% of the respondents agreed with the view but 19.5% remained neutral. Conversely, 24% of the participants disagreed with the view while 23.7% strongly disagreed with the view. Nearly a third of the respondents said that financial services do not products that meet their needs. This is because financial
institutions perceive agriculture as risky. This perception makes them averse and hence may not understand the factor well to develop appropriate products that match their needs. The graph below summarizes the findings.

![Graph](image)

**Figure 12: Rating on Ability of Financial Products to Meet Client’s Needs**

### 4.4.3 Lack Expertise

Milk is a perishable and productivity patterns are not consistent. This view was shared by 10.3% who agreed and 9.1% strongly agreed. Further analysis showed that, 17.9% of the respondents were neutral but 17.7% disagreed with the view. In addition, 45% strongly disagreed with the view. The fact that milk is perishable means that it has a short life and therefore cannot be stored and sold when demand is low like other agricultural commodities for example grains such as maize and rice. The farmer therefore sells the milk to the buyer at the buyer’s terms. Productivity of milk is affected by weather conditions and therefore the reasons for disparity in the production. Low periods of productivity may cause anxiety to financial service providers especially where provision of credit is concerned. On the other hand, products that factor in these risks could be developed. Furthermore perishability of the produce offers opportunity for financiers to provide business opportunities at the local level for storage facilities. USAID (2008) identified such opportunities in the dairy sector in Kenya.
4.4.4 Opportunities in Dairy Value Chain Financing

Rating on accepting group guarantees and security in form of products delivered shows rated 24.3% strongly agreed, 20.1% agreed while 15.8% neutral. Twenty four percent (24.9%) of the respondents rated disagreed while 15% rated strongly disagree. The rating shows that most respondent favor group security as opposed to providing own security for loan. This could be due to ability to fundraise within the group to offset loan payments which could be relatively easier as opposed to struggling as an individual. Group leading and guarantees also enables banks to relax their terms and at times interest. Those who disagree may bit favor the mechanism because of the social cohesion and group responsibility it bears. The table below summarizes the findings.

Table 15: Accepting Group Guarantees and Security such as Products Delivered

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>53</td>
<td>15.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>88</td>
<td>24.9</td>
<td>24.9</td>
</tr>
<tr>
<td>Neutral</td>
<td>56</td>
<td>15.8</td>
<td>15.8</td>
</tr>
<tr>
<td>Agree</td>
<td>71</td>
<td>20.1</td>
<td>20.1</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>86</td>
<td>24.3</td>
<td>24.3</td>
</tr>
<tr>
<td>Total</td>
<td>354</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Developing of financial products matching customer needs is an opportunity that 27.7% of the respondents strongly agreed with. Further, 19.3% of the respondents agreed with the view but 24.5% who were the majority remained neutral to the view. Further analysis
also showed that 20.2% disagreed while 8.4% strongly disagreed with the view. The Figure below summarizes the findings.

![Bar chart showing ratings](chart1.png)

**Figure 14: Rating on Development of Products Matching Customers Needs**

According to the study, a cumulative percentage of 56.7% respondents supported the view that enhancing customer financial training through seminars and workshops was an opportunity financial service providers could harness. Precisely, 31.1% agreed with the view while 25.6% strongly agreed. On the other hand, 9.9% strongly disagreed with the view while 17.7% disagreed. The remaining 15.7% were neutral. The rating by those who strongly agreed or agreed with view could be linked to marketing where customers seek to gain more insight of products and services available to them. The Figure below summarizes the findings.

![Pie chart showing ratings](chart2.png)

**Figure 15: Enhancing Customer Financial Training through Seminars and Workshops**
4.5 Policy Implications of Financial Services by the Financial Services Providers

The third specific objective of this study was to establish the policy implications of financial services by the financial services providers. In this regard the respondents were required to indicate their level of agreement with statements on what the banks should do to increase the services they offer to customers in the dairy sector.

4.5.1 Financing Policies

According to the research, 29.7% of the respondents strongly disagreed with the view that lowering interest rates would be an opportunities to financial services providers. 7.6% disagreed while 12.7% remained neutral to the view. On the other hand, 9.6% of the respondents agreed while 40.4% of the respondents who were the majority strongly agreed with the view. The sentiments above may be attributed to the fact that those sampled are from a cooperative. The fact that the owners of the cooperative are also members of the cooperative indicate that members join for different reasons. While some join to access financial services, others join so as to market their produce while others join so as to earn a dividend. The graph below summarizes the findings.

![Figure 16: Rating on Lowering Interests](image)

4.5.2 Marketing Policies

According to the study, 22.9% strongly agreed with the view that increasing the distribution channels would be an opportunity to service providers. Fifteen percent (15.3%) of those who participated in the study agreed with the view but 25.4% strongly disagreed. Further, 22% disagreed while 14.4% were neutral to the view. The main reason why distribution may not be a major factor is because financial services in Kenya can

66
now be reached through mobile banking services such as the M-pesa platform. The cost of transaction is therefore not high for such famers.

Table 16: Rating on Increasing the Distribution Channels

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>90</td>
<td>25.4</td>
<td>25.4</td>
<td>25.4</td>
</tr>
<tr>
<td>Disagree</td>
<td>78</td>
<td>22.0</td>
<td>22.0</td>
<td>47.5</td>
</tr>
<tr>
<td>Neutral</td>
<td>51</td>
<td>14.4</td>
<td>14.4</td>
<td>61.9</td>
</tr>
<tr>
<td>Agree</td>
<td>54</td>
<td>15.3</td>
<td>15.3</td>
<td>77.1</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>81</td>
<td>22.9</td>
<td>22.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>354</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.5.3 Agricultural Frameworks

Study findings indicate that 38.2% and 16.1% of the respondents strongly agreed and agreed (in that order) that educating stakeholders on agricultural financial services available was an opportunity available to service provider in reaching more customers. Seventeen percent (17.6%) held a neutral view but 21.8% and 6.2% disagreed and strongly agreed with the view respectively. The graph below summarizes the findings.

Figure 17: Rating on Educating Stakeholders on Agricultural Services Available

4.6 Inferential Analysis

4.6.1 Chi-Square Analysis

The null hypothesis was undertaken for analysis. To achieve this, a Chi-square ($\chi^2$) test of significance was used to determine whether or not a relationship other than chance existed between the variables investigated. A statistic that is often used to test the null hypotheses, i.e. that the row and column variables are independent, is the Pearson Chi-square. The calculated Chi-square was computed and then compared with the critical
points of the theoretical Chi-square distribution to produce an estimate of how likely or unlikely this calculated value was if the two variables were in fact independent. Any decision to reject the null hypothesis was based on the probability or the observed significance level.

H1: There is a significant relationship between access to financial services and gender

The results from analysis shows that there is no relationship between access to financial services and gender (P-value= 0.907) greater than 0.05 (95% confidence level). The null hypothesis (H0) that there is no significant relationship between access to financial services and gender was accepted. This analysis corresponds to the current financial environment where financial institution desists from discriminating access to finance based on gender. Women who formed over seventy per cent of the sampled population are becoming more and more active economically. As a result financial service providers do not discriminate against them. As a result gender is not barrier to financial access in this regard. The table below summarize the findings.

Table 17: ANOVA (b)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>.003</td>
<td>1</td>
<td>.003</td>
<td>.014</td>
<td>.907(a)</td>
</tr>
<tr>
<td>Residual</td>
<td>65.372</td>
<td>348</td>
<td>.188</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>65.374</td>
<td>349</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Predictors: (Constant), Have financial institutions ever refused you a financial service?

H2: There is a significant relationship between access to financial services and age

Chi-square analysis showed that there is no significant relationship between access to finance and age \( \chi^2 (3, N = 350) = 1.259 a, \ p =0 .739 \) greater than 0.05 (or 95% confidence level). The null hypothesis (H0) that there is no significant relationship between access to finance and age was accepted. Analysis also showed that the ratio of male to female respondents was approximately 1:2, applying this ratio to the cross tabulation of age vs access to finance, one can still conclude that there is no relationship.

H3: There is significant positive relationship between access to financial services and monthly income
Chi-square tests revealed that there is no significant positive relationship between access to financial services and monthly income (P-value 0.403) greater than p = 0.05 (or 95% confidence level). The null hypothesis (H₀) that there is no relationship between significant positive relationship between access to financial services and monthly income was therefore accepted. The assumption was that financial services providers understood that most dairy farmers’ monthly income data is not reliable. Therefore, more emphasis are put on securing services through other means such as group lending, use of land or farm house machinery as collateral. Consequently, in the dairy sector, unlike other sectors where a strong relationship between the variables would be expected, this analysis is valid.

H₄: There is a significant positive relationship between access to financial services and reason for venturing in dairy sector

Chi-square tests revealed that there is no significant positive relationship between access to financial services and reason for venturing in dairy sector \(\chi^2 (2, N = 350) = 0.618a, p = 0.734\) greater than 0.05 (or 95% confidence level)). The main assumption was that the propensity to seek financial services was dependent on one being refused or granted financial services. The alternative hypothesis (H₁) that there is no significant positive relationship between access to financial services and reason for venturing in dairy sector was rejected. The table below summarises the findings.

**Table 18: Chi-Square Tests for Reasons of Venturing in Dairy Sector**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
<th>Point Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>.618(a)</td>
<td>2</td>
<td>.734</td>
<td>.787</td>
<td>.787</td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>.634</td>
<td>2</td>
<td>.728</td>
<td>.787</td>
<td>.787</td>
<td></td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td>.598</td>
<td>2</td>
<td>.535</td>
<td>.284</td>
<td>.079</td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear</td>
<td>.495(b)</td>
<td>1</td>
<td>.482</td>
<td>.284</td>
<td>.079</td>
<td></td>
</tr>
<tr>
<td>Association</td>
<td>350</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.31.

b. The standardized statistic is .703.
4.6.2 Multiple Regression Analysis

In addition, the researcher conducted a multiple regression analysis so as to identify the constraints to the access to financial services in dairy value chains. Multiple regressions are a statistical technique that allows for the prediction of a score of one variable on the basis of their scores on numerous other variables. The main purpose of multiple regressions is to study and discover more about the relationship between several independent or predictor variables as well as a dependent or even criterion variable.

Table 19: Multiple Regression Analysis

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>2.837</td>
<td>.112</td>
<td>4.358</td>
<td>0.000</td>
</tr>
<tr>
<td>Gender</td>
<td>0.553</td>
<td>.146</td>
<td>0.330</td>
<td>2.276</td>
</tr>
<tr>
<td>Age</td>
<td>0.753</td>
<td>.088</td>
<td>0.167</td>
<td>1.379</td>
</tr>
<tr>
<td>Level of income</td>
<td>0.637</td>
<td>.075</td>
<td>0.235</td>
<td>2.793</td>
</tr>
<tr>
<td>Reasons for venturing into the dairy sector</td>
<td>0.474</td>
<td>.064</td>
<td>0.314</td>
<td>4.009</td>
</tr>
</tbody>
</table>

Dependent Variable: Access to financial services

The researcher conducted a multiple regression analysis so as to determinants of access to financial services and the four independent variables. The regression equation \( Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 \) now becomes:

\[
Y = 1.224 +0.2176 X_1 +0.1187X_2 + 0.2994X_3 + 0.2725X_4
\]

Whereby \( Y = \text{Access to financial services} \),
\( X_1 = \text{Gender} \),
\( X_2 = \text{Age} \),
\( X_3 = \text{Level of income} \),
\( X_4 = \text{Reason for venturing into the dairy sector} \)

From the above regression model, taking all factors (gender, age, level of income and reason for venturing into the dairy sector) constant at zero, the access to financial services realized would be 2.837. The data findings analyzed also shows that taking all other
independent variables at zero, a unit increase in gender lead to a 0.553 increase in access to financial services. A unit increase in age will lead to a 0.753 increase in access to financial services; a unit increase in level of income will lead to a 0.637 increase in access to financial services, whereas a unit increase in reason for venturing into the dairy sector will lead to a 0.474 increase in access to financial services. These results infer that age contributes more to access to financial services, followed by level of income and gender, while reason for venturing into the dairy sector contributes the least to access to financial services in Kenya. Based on the results, all the explanatory variables are statistically significant (p= 0.015, P= 0.041, P= 0.024, and P= 0.030). In statistics, a significant level of p <0.05 is significant. This means that the four predictor variables are useful for predicting the access to financial services among the dairy sector in Kenya.

4.7 Chapter summary
The purpose of this chapter was mainly to present analysis of low data collected using questionnaires (see appendix). Descriptive statistics were used to generate frequencies while inferential statistics were used in testing relationship between key variables. The chapter is composed of three section, that is, general data, rating analysis and hypothesis tests sections. Findings show that majority of the respondents had ventured in to dairy sector for commercial reasons. Study findings also show that that lack of finances remains a major obstacle to business growth.

The study also established that there are various financial services rendered to small-scale dairy farmers in Nakuru Milk shed by the financial services providers. The finance is sought from commercial banks, microfinance institutions and co-operative unions. There are various constraints facing the dairy value chain financing among dairy farmers in Nakuru in Kenya which include high interest rates, lack of collateral/loan security and information about credit products. The next chapter concentrates on providing the summary of the findings, giving the discussions and conclusions as well as making credible recommendations of the study based on the objectives of the study.
CHAPTER 5: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction
This is the final chapter in this study which gives a summary of the report, discussions on research questions, conclusion and recommendations based on the objective of the study and suggestions for further findings. It comes after identifying the background, problem at hand and the objectives in chapter one, literature review was done in chapter two, chapter three set out the methodology that the study used to collect data and chapter four analyzed the data obtained from the study. The chapter finally presents the suggestions for further studies.

5.2 Summary
This study aimed at examining access of finance for agriculture in Kenya with a view to identifying constraint and challenges which hinders the access to financial services in dairy value chains. This study sought to answer the following questions; what are the core financial activities and services rendered to small-scale dairy farmers in Nakuru Milk shed, what are the major constrains and opportunities available financial services providers in provisions of financing services to the Dairy sector, what can be done to improve access to financial services by dairy value chain producers and what are the policy implications.

The research methodology used in this study was descriptive in nature. A sample of 354 respondents in the dairy sub-sector was selected from Nakuru to participate in the study. Analysis shows that of the 354 respondents, 25% were male while 75% were female. Their ages ranged from less than 30 years to over 51 years. Further analysis showed that 18.9% had had no education but 81% had had at least primary level education. The income of the respondents ranged between Ksh.20, 000 and 100,000. Majority (48%) earned between Ksh.20, 000 and 40,000. Majority of the respondents at one time had applied or accessed credit from financial institutions which identified as banks, SACCos and MFIs.

All of these financial institutions primarily banks provided credit services. Further analysis showed there was high demand of credit products given over 57% of the respondent main constraint to growth was lack of finances. Further, rating shows that
50% of the respondents strongly agree or agree that lowering interest rates on credit would be an opportunity for financial institutions to capitalize on. Analysis also should there is need to improve access to finance in the dairy value chain given that 90% of the respondents invested in the sub-sector for commercial purposes.

The study found that there are various constraints facing the dairy value chain financing among dairy farmers in Nakuru in Kenya which include high interest rates, lack of collateral/loan security and information about credit products. The findings are similar to those by Beynon et al, (1998) who identifies a number of policy and institutional issues that need to be addressed by various stakeholders in the industry in charting the way forward including measures to enhance productivity and competitiveness of production and institutional framework to safeguard and improve hygienic standards of the raw milk while charting suitable development path for the informal milk market. They also observe that although the country can produce milk competitively, this advantage is lost due to inefficiencies in milk collection, marketing and processing due to lack of government support and poor government policies.

It is however worth noting that the observed lack of positive relationship between access to financial services and reason for venturing in dairy sector could be extended to mean that most respondents did not fully see dairy farming as purely commercial enterprise and as such had not maximized returns on the venture. It was also evident from the data that high interest rates on credit remain a big barrier to access to finances by dairy farmers as indicated by 59% who agreed/strongly agreed with the view.

The study established that any changes in these factors affect dairy sub sector to a great extent. On the effect that this had on dairy sub sector most of the farmers commented in the negative, saying, the production has been on the decrease. Farmers are not given any incentives to encourage them to increase their herds and put more effort in their daily farming. The government has not put in place laws to regulate prices of dairy products and costs of inputs leading to a lot of difficulties on the part of the farmer.

5.3 Discussions
5.3.1 Financial Services Offered
The main financial services provided to dairy farmers in the county of Nakuru are loans, banking and insurance services. From the study, it is evident that most dairy farmers are
not satisfied with the services rendered mainly due high cost of interests on credit and cost of inputs required in production. Miller and Jones (2010) suggests that by understanding the agricultural chain, the lender can make more informed decisions of how to structure financing to reduce the costs and the short and longer-term risks such that financing becomes attractive.

While it is evident that some of the services offered by the financial service providers do not address the specific needs of some farmers, there is some level of access to services such as banking (savings and other related transactions) and credit. These services are offered by a range of financial service providers such as MFIs, Cooperatives and banks. These service providers use different models to provide these services, these include, group guaranteed and use of collateral. It is evident that these models are rated differently by different categories of those interviewed with the group guarantee mechanism being the best rated. This is because a number of those interviewed may not have collateral. Also, others who may have the collateral such as land may not want to risk it in case of non-repayment because the land they possess may be traditional (that is land inherited from parents).

According to Mapiye et al, (2006), most small-scale farms in Kenya are considered to be both businesses and family residences, which can cause problems when small-scale farmers apply for credit. Funding has a big influence on dairy sub sector. The study brought out the fact that farmers are not able to secure loans to better their farming practices. Most of them have no other collateral to offer as security except the same cows that are not very well maintained. This in effect means that the farmers are not able to feed their animals on quality feeds, or even better breeding facilities like semen and purchase of quality animals. Farmers cannot afford to employ modern ways of farming because most of the requirements are out of their reach.

Although it is evident from the study that farmers continue to face challenges in accessing financial services. It is clear that financial services providers have created a level field in terms of access of finances by both men and women. Interviews held during this study show that financial services providers are keener on credit rating of the applicant and not the gender.
5.3.2 Constraints faced in the Dairy Value Chain Financing

Findings from this study however show that most financiers lack products that are affordable and accessible to all farmers. The main constraints to access of finance by producers in the sub-sector can also be extended to other agricultural sub-sectors where seasonality of production, adverse weather, diseases etc. affects income predictability. The risks associated with agribusiness limit access to finances, this observation made by Fries and Akin (2004) remains evident from study findings that show most respondents had failed to secure credit numerous times due to unpredictable income patterns. As such most farmers fail general credit rating applied by financial institutions.

For value chain finance actors in developing economies, the major challenge remains as provision of longer-term loans for capital investment. In sub-Saharan Africa, in particular, where the majority of the lesser developed countries of the world exist; increasing access to inclusive finance for MSMEs is being recognized as a critical component of the effort to break the existing cycle of poverty (FSD Kenya, 2009). The findings indicate that there is disconnect between the producers and financial service providers. With climatic changes and non-reliable production patterns, it is understandable that financial institutions are averse to this segment of the market. Opportunities to develop products especially for the dairy sector which has a developed value chain exist for financial service providers. USAID (2008) identified that all players in this value chain are profitable with various gross margins ranging from nine percent to three hundred percent.

5.3.3 Policy Implications

Incorporating the poor into the economic mainstream is recognized as the only sustainable way to advance development in the world’s poorest countries. The financial success of traditional commercial banking institutions such as Equity Bank of Kenya in serving base of the pyramid markets has also been a catalyst for their peers and competitors to begin to focus more on service provision to this previously ignored market. Interventions by the government through changes in lending policies for financial institutions dealing with farmers, policies allowing subsidies on agricultural farm inputs and policies on provision and scope of extension services are required to improve performance of the whole agricultural sector (FSD Kenya, 2009).

While it is imperative for financial service providers to understand the needs of the market, they are also in the business of providing financial services and being profitable.
With agriculture being the backbone of developing countries such as Kenya, the performance of all sub-sectors is paramount to performance of the whole agricultural sector in particular and the economy in general. The government and other private actors have put effort on financing and modernizing the agricultural value chain, the finance value chain finance which connects the actors involved in the process of production, trading, processing and retailing with financers who have different financing products has failed to satisfy the market. Further, the government in partnership with research institutions needs to invest in assisting banks to understand this sector better and hence provide relevant services that will positively contribute to growth.

In addition, such studies will inform the government on how to regulate financial institutions serving the agricultural sector. For example, WOCCU (2009b) indicates that a loan given to a salaried employee cannot be the same as that provided by a farmer of coffee who receives one payment per year. In this regard therefore, a value chain approach in understanding various sub sectors may be required. For example in the dairy sector the issue of perishability and therefore the need for good infrastructure is evident. Such services are usually provided by government. Research if conducted would inform the government on where and how to invest across various geographical area of the country.

5.4 Conclusions

5.4.1 Financial Services

The study concludes that the stakeholders in the dairy sector finance their businesses form their saving, microfinance institutions, commercial banks, co-operative unions and from savings, co-operatives unions & co-operative unions, while others seek finance for their businesses from microfinance institutions. Farmers in the dairy sector do not have sufficient forms of financing to support their dairy sub sector.

5.4.2 Constraints

The study deduced that the various constraints faced in the sector include lack of collateral, high interest rates, lack of loan security and information about credit products. In addition they face challenges like lack of information on available products, products not meeting their needs, short repayment period and a combination of high interests, lack of collateral and short loan repayment period. The regime of high interest rates charged
by financial institutions in Kenya is therefore seen as a major hindrance to financial services. The basis of a cooperative is it is therefore supposed to offer better services.

5.4.3 Policy Implications
The study further concludes that the banks should do to increase the services they offer to customers in the dairy sector. In addition, lowering interest rates would be an opportunity to financial services providers and increasing the distribution channels would be an opportunity to service providers. The main reason why distribution may not be a major factor is because financial services in Kenya can now be reached through mobile banking services such as the M-pesa platform. The cost of transaction is therefore not high for such famers. Further, group leading and guarantees also enables banks to relax their terms and at times interest and educating stakeholders on agricultural financial services available was an opportunity available to service provider in reaching more customers.

5.5 Recommendations
5.5.1 Recommendations for Improvement
5.5.1.1 Financing Services
In general terms as the size of the loans demanded by the businesses increases, there is a concurrent increase in complexity of application procedures and a greater need for the leaders to obtain collateral. At this stage, some dairy sector entrepreneurs become generally disadvantaged by lack of property. Therefore, the financial institutions should take cognizance of this fact be encouraged in policy and in practice in order to improve the lot of dairy sector entrepreneurs participation in their programs.

5.5.1.2 Challenges facing Dairy Value Chain Financing
Lending institutions must review their procedures and activities to focus on the vibrant dairy value chain. The current lending environment favors than business lending rather personal lending especially by those engaged in farming. As a result the entrepreneurs are unable to access capital in quantities that can satisfy their business needs. This capital is therefore not tied to the performance of the business. It’s therefore increasingly evident that lending institutions must focus more on the sector to enable them achieve their financial needs.
5.5.1.3 Opportunities in the dairy Value Chain Financing
The inability to access credit due to high interests that hampers growth in agriculture in an area the government needs to focus on. A policy to give incentives to financial services providers giving cheap credit to farmers ought to be considered. Together with a policy that gives tax subsidies to companies that deal in farm inputs or those buying farm produce, the mentioned policies would help more people engage in production thereby increasing volumes which will in turn contribute to the GDP.

5.5.1.4 Policy Implications
A favorable legal and regulatory framework should be established to facilitate availability of affordable credit to dairy farmer. The government cannot ignore that sector is crucial in performance of the whole economy. Further, with increasing unemployment in other sectors, agriculture and in particular dairy farming is an alternative source of employment. It should therefore facilitate the growth of this sector by putting in place policies that favor low interest borrowing, affordability of inputs among others.

5.5.2 Recommendations for Further Research
Given that dairy subsector is a key component of the agriculture sector in Kenya, agriculture infrastructural requirements as well as investment requirements and options for financing agriculture promoting projects including public private partnerships, project financing and/or an appropriate throughput tariff structure that will spur productivity of the sector development are imminently needed. There is need for a more focused research on all the other possible strategic approaches of enhancing financing performance of the agricultural subsectors in Kenya and the sector as a whole.

Other areas of further research that were identified include a similar study to be carried out on other sectors of the agriculture sector in Kenya. This could be on the same topic on challenges and opportunities in financing agricultural value chain in Kenya. The researcher recommends a study to be done to determine the effect of financing services investigated in this study on the dairy farming/agribusiness performance.
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APPENDICES

Appendix I: Quantitative Questionnaire

This questionnaire is meant to collect data for the purposes of an academic research. Information collected for this research from respondents will be used for academic purposes only and will be treated with utmost confidentiality;

Farmers

SECTION A: BACKGROUND INFORMATION

1. Gender
   - Male
   - Female

2. Age group
   - Less than 30 years
   - 30-40
   - 41-50
   - 51 and above

3. Level of Education
   - Less than 8 years
   - Primary
   - Secondary
   - University/College

4. Marital status:
   - Single
   - Married

5. How many years of farming/Business experience do you have? ………..
6. What are the major reasons for venturing into the dairy sector?

   For commercial reasons
   For traditional reasons
   As a hobby

7. What challenges do you get when expanding your business/herd?

   Lack of finances
   Lack of markets for products
   Management constrains
   Others (Specify)

SECTION B: FINANCIAL SERVICES

8. Have you ever looked for financial services?

   Yes  No

9. What financial services did you look for?

   Insurance
   Savings
   Credit
   Micro Leasing
   Other services (specify)
10. From where do you finance for your business?

   Savings
   Commercial banks
   Microfinance institutions
   Non Governmental Organizations
   Co-operative unions

   Others (Specify) .................................................................

11. Are you a member of a co-operative society?

   Yes   ☐   No   ☐

SECTION B: CHALLENGES AND OPPORTUNITIES TO FINANCING

12. Do you have challenges get finance for your business?

   Yes   ☐   No   ☐

13. If yes how would you rank the following challenges from 1-4

   High interest rates
   Lack of security & collateral
   Lack of information about products
   Products that don’t meet needs

   Others (Specify) ........................................................................

14. Have a financial institution ever refused you a financial service?

   Yes   ☐   No   ☐
15. What financial service were you denied?

- Credit
- Insurance service
- Leasing
- Savings (Transactions)
- Other Services (specify) ………………………………………………….

16. Do you have any training on financial management?

- Yes
- No

17. Do you take insurance for your products

- Yes
- No

18. If no why;

- It is costly
- Lack of information on insurance products
- In don’t need insurance
- Others (Specify) …………………………………………………………………

19. Please rate the following barriers to access to financial services (On a scale of 1 – 5 where 1 is the least barrier and 5 the biggest barrier to access to financial service by farmers)

<table>
<thead>
<tr>
<th>Please rate the following barriers to access to financial services</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High transaction costs (e.g. Interest rates)</td>
<td></td>
</tr>
<tr>
<td>Lack of distribution channels e.g. bank branches</td>
<td></td>
</tr>
<tr>
<td>Lack of security &amp; collateral to secure loans</td>
<td></td>
</tr>
<tr>
<td>Lack of information on the financial services</td>
<td></td>
</tr>
</tbody>
</table>
Requirement for banks to have operated with them before accessing credit services
Lack of financial products matching customer needs
Product perishability and production patterns

SECTION D: POLICY IMPLICATIONS
20. What should the bank do to increase the services they offer to customers in the dairy sector (Please rank on 1 -5 scale with 1 being the lowest and 5 the highest score)

<table>
<thead>
<tr>
<th>Please rate the following opportunities available to Finance service providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowering of transaction costs</td>
</tr>
<tr>
<td>Increase the distribution channels e.g. branches and agencies</td>
</tr>
<tr>
<td>Accept group guarantees and security in form of products delivered</td>
</tr>
<tr>
<td>Educate stakeholders on agricultural financial services available</td>
</tr>
<tr>
<td>Development of financial products matching customer needs</td>
</tr>
<tr>
<td>Enhance customer financial training through seminars and workshops</td>
</tr>
</tbody>
</table>