



**ASSESSMENT OF THE ROLE OF CO-OPERATIVES IN SMALL HOLDER
DAIRY PRODUCTION AND MARKETING. (THE CASE OF BIFTU BERGA
DAIRY COOPERATIVE UNION, OROMIYA NATIONAL REGIONAL STATE,
WEST SHOWA ZONE, ETHIOPIA)**

BY

KEFIYALEW BEYENE HUNDERA

**ATHESIS SUBMITTED TO INDIRA GANDHI NATIONAL OPEN
UNIVERSITY (IGNOU) IN PARTIAL FULFILMENT FOR THE DEGREE OF
MASTERS OF ART IN RURAL DEVELOPMENT**

NOVEMBER, 2015

ADDIS ABABA, ETHIOPIA



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DECLARATION

I, Kefiyalew Beyene declare that this thesis, which I hereby submit for the partial fulfillment of masters of art in Rural Development to the University of Indira Gandhi National Open University (IGNOU), New Delhi, is my work and has not previously been submitted to IGNOU or to any other institutions for the fulfillment of the requirement of any course of study.

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Signature _____

CERTIFICATE

This is to certify that Mr. Kefiyalew Beyene student of masters of art in rural development from Indira Gandhi National Open University (IGNOU) New Delhi, has been working under my supervision and guidance for this project work. His project work entitled “ASSESSMENT OF THE ROLE OF CO-OPERATIVES IN SMALL HOLDER DAIRY PRODUCTION AND MARKETING. (THE CASE OF BIFTU BERGA DAIRY COOPERATIVE UNION, OROMIYA NATIONAL REGIONAL STATE, WEST SHOWA ZONE, ETHIOPIA.)”

which he is submitted is genuine & original work.

Place: Addis Ababa, Ethiopia

Date: November, 2015

Signature: _____

Name: Wondimagegne Chekol (PhD)

ACKNOWLEDGEMENTS

First and foremost I would like to thank GOD, because his blessings and grace makes all possible.

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DEDICATION

I Dedicate this research to my father Beyene Hundera who sacrificed much to bring me up to this level but not lucky to see the final fruits of my effort.

ABSTRACT

The study investigated the role of co-operatives in smallholder dairy production and marketing taking Biftu berga dairy cooperative union as the case study. The study was undertaken to determine the effectiveness of co-operatives in improving production and marketing as well as in minimization of transaction costs. Both quantitative and qualitative method were used for this study and primary data were collected from 90 smallholder dairy farmers which was supplemented by information from focused group discussion with dairy producers, board members of the cooperative and key informants. Results of the survey indicate that co-operatives play a positive role in production and marketing activities of smallholder dairy farmers, although certain developments such as provision of support programmes need to take place in order for them to make a more significant contribution. Co-operative members produce and sell higher quantities of milk (19.3% higher and 24.5% higher respectively), which is mainly attributed to provision of technical inputs. Co-operatives also provide farmers with a reliable market, although price paid is lower compared to that of independent farmers in the same areas. Low income is compensated by the fact that co-operative members incur lower transaction costs indicated by the lower transportation costs per unit of output, adequate access to market information through frequent visits of extension officers and regular training, as well as a lower percentage of losses incurred compared to independent farmers. Results of the study confirm the hypothesis that co-operative members perform better and incur lower transaction costs than independent farmers. Results of the regression model indicate that distance, access to market information, milk output and co-operative participation significantly influence the quantity of marketable milk, and hence contribute to lower transaction costs incurred. The results show that co-operative farmers incur lower transaction costs although they sell their milk at a lower price. Nevertheless, the fixed price effect renders co-operative farmers not susceptible to price fluctuation risks that independent farmers are faced with because of their volatile prices. The study suggests that there

is a need for support programmes that will help motivate individual farmers and strengthen co-operatives, as their contribution to smallholder production and marketing is still marginal. Support programmes include provision of a supportive policy environment, infrastructure development, access to financial and credit facilities and improvement of training and extension to provide more extensive dynamic opportunities to farmers. In terms of further research, the study recommends that a similar study be undertaken in other areas of the country so that the study is representative of the whole country. In addition, further research is needed on performance of dairy co-operatives to enable replication of successful co-operatives in the country which will go a long way in improvement of the dairy industry as a whole.

Key Words: *Co-operatives, Smallholder, Marketing, Production, Transaction Cost.*

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CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND

The livestock sector in developing countries plays an important role in contributing to rural livelihoods, particularly those of the poor. The sector is estimated to constitute approximately a third of agricultural GDP in developing countries and this share is rising (World Bank, 2009:16). The rapid increase in livestock production in these countries is attributed to a fast-growing demand for livestock products, resulting especially from an increasing urban population as well as a rising consumer income. Dairy production forms part of the livestock sector and is regarded as an important farming activity, especially in the developing world, providing supplementary income, employment and nutrition to a number of people, particularly in rural areas (International Fund for Agriculture Development, 2001:20).

Dairy production is also an important activity in Ethiopia. It is a source of income and employment generation for small and marginal farmers in the country. In addition to this, it is a source of food for those who traditionally consume in the form of sour milk. However, despite of the country has for dairy production, the sector is largely underdeveloped. Due to this milk production has not yet increased significantly although the demand especially in the urban area. The low performance and underdevelopment of the dairy sector is attributed to the fact that smallholder farmers, who constitute a large percentage of the dairy subsector, are still facing with serious limitations in accessing essential inputs, shortage and fluctuation in quality and quantity of feed, poor genetic resource base, poor management practices, poor market infrastructure, poor service delivery, policy and institutional arrangements (MOA, 2004:20). Though these problems are the major constraints for milk production, still farmers produce milk.

To improve dairy development and remove some of the important constraints, efforts have been made by government and non government in various aspects to help develop the industry and help smallholder farmers to improve particularly their production and marketing capabilities. These efforts include the provision of input and services, such as veterinary service, breed improvement, feed resources development, extension services and development, credit accessibility and marketing. However, such efforts have not made milk shortage in the country. In addition, policies and strategies put into place to promote milk production have not yet addressed the key concerns of smallholder milk collection and processing activity. This has been also considered as a limiting factor in the success of many development projects in the dairy sector. The problems encountered by smallholder dairy farmers in the country indicate that, the general problems of smallholder farmers encounter in most developing countries, were limited access to physical and financial resources which restricts their opportunities to increase scale of production due to high transaction costs (Kruijssen, Keizer & Giuliani, and 2006:2). In addition, farmers have limited technical skills, lack of access to training on production and processing, information on market requirements, and lack bargaining power. Experiences gained particularly in East Asia and East Africa indicates that co-operatives are among the institutional arrangements that can help smallholder farmers to overcome the numerous constraints they are faced with. Co-operatives have the potential to improve productivity in the smallholder sector as well as enhance market participation by farmers (Birthal, Joshi & Gulati, 2005:2). In this regard, the Government of Ethiopia has recognized farmer-controlled co-operatives as an instrument of change that can effectively reduce transaction costs, increase farmer productivity as well as enhance market participation by smallholder farmers. Consequently, policies have been drafted for co-operative development to encourage more producer organizations, especially in the smallholder dairy sector. Encouraging farmers to act collectively is therefore seen as one viable strategy for Addressing constraints, especially in the smallholder sector (Shiferaw, Obare & Muricho, 2006:3:).

Although co-operatives have had an unhappy history, especially in Africa, evidence indicates that they have the potential of linking farmers to market (Develtere, Pollet & Wanyama, 2008:366) by reducing transaction costs. Improving smallholders' access to market is considered essential to enhance their income and increase the number of marketing options available to them (Markelova, Meinzen-Dick, Hellin & Dorhn, 2009:1).

Difficulties in market access limit income-generating opportunities by farmers which can result in subsistence rather than market-oriented dairy production systems. Organizing farmers through dairy co-operatives has many advantages over individual farming. It improves or facilitates access to market information, reduces costs of marketing, increases producers' access to technology, extension and related services, thereby enhancing efficiency in production and marketing of milk as well as dairy products (Lapar, Trong Binh, Tuan Son, Tiongco, Jabbar, & Staal, 2006:2). Hence, development interventions should be aimed at improving production and marketing activities of smallholder farmers by addressing constraints in the smallholder sector. This can be achieved through collective organisations such as farmer associations and co-operatives. Similarly, Government has a role to play in development of infrastructure and provision of technical services as co-operatives are unable to do so due to their limited access particularly to financial resources. However not all cooperatives are successful in assisting small holder farmers engaged in dairy production. Thus, this study will urges to assess the role of cooperatives in small holder dairy production and marketing.

1.2 PROBLEM STATEMENT.

During the late 1990s, the government of Ethiopia revived its interest in cooperatives and they become part and parcel of the country's agriculture and rural development strategy (Getnet and Tsegaye, 2012; Ministry of Finance and Economic Development, 2006). In particular, the government strongly promoted agricultural cooperatives to encourage smallholders' participation in the market (Bernard et al., 2008). As

proclaimed in the new legal framework, this new wave of cooperative organizations was thought to be different from previous cooperative movements. The new policy allows cooperatives to be diverse and independent participants in the free market economy. While there is evidence that suggests a consequent growth in the cooperative movement in Ethiopia, its coverage remains 35 per cent of *kebeles*, and only 17 per cent of the households living in those *kebeles* are members (Bernard et al., 2008). With regards to performance, the roles of cooperatives on its members are less studied. There have been only a few attempts made to understand their production and marketing role and the results are mixed. Ethiopia has a huge untapped potential for market-oriented development of smallholder dairy production. The population of milking cows in the country is estimated at 9.9 million heads (CSA, 2008) although the majority of these fulfill multiple functions besides dairy production. The agro-ecology, particularly of the Ethiopian highland mixed crop–livestock systems, is considered conducive and relatively disease-free to support crossbred dairy cattle (Ahmed et al. 2004). Livestock currently support and sustain livelihoods for 80% of all rural poor. Female cattle constitute about 55.48% of the national herd. Of the total female cattle population, dairy and milking cows total 16,941,361, of which 14.24% are dairy cows (cow of any breed kept primarily for milking purposes) and 20.12% are milking cows (cow of any breed which has been milked but not necessarily been kept for milking purposes (CSA, 2008). Eighty-three percent of all milk produced in Ethiopia comes from cattle with the remainder coming from goats and camels (MoARD, 2007). Ethiopia produces approximately 3.2 billion liters per year from 10 million milking cows. The farm-level value of the milk is an estimated 16 billion Ethiopian Birr per year. On the other hand, the dairy sub-sector is currently facing a number of problems that have persisted for decades. Productivity of the dairy herd is low. The population of exotic and crossbred dairy cows accounted for less than 1% of the total dairy cattle. High mortality rates occur due to poor nutrition which makes cattle vulnerable to disease. Producers in the rural areas lack access to markets and extension services which reduces the

ability of smallholder producers to be competitive. Feed production and distribution is not coordinated. Only 0.15% of rural livestock holders are involved in an on-farm production of improved forages like alfalfa and Napier grass (Tefera, 2010); the use of industrial by-products like oil cake, bran, and brewery residue is negligible (0.8%) (Tefera, 2010). Efforts have been made in various aspects to help develop the local industry and to especially help smallholder farmers to improve their production and marketing capabilities. Despite this and decades of developments, small-holder dairy farmers still lack essential inputs, have limited access to guaranteed markets and credit for their produce and are faced with high transaction costs. As stated in the background, evidence from countries in East Asia and East Africa, such as India and Kenya, suggests that co-operatives are a viable strategy in which challenges in the smallholder dairy sector can be addressed. Co-operatives play a major role in improving productivity, minimizing transaction costs, and improving marketing capabilities of farmers. As a result, a number of producer co-operatives have been established in the dairy sector and formation of these organizations is being encouraged by the Government. This has been done with the certainty that dairy co-operatives will yield the same results as countries that have been successful in their development of the smallholder dairy sub-sector and positively influencing production. For farmers to improve their productivity and access markets, they need to overcome the constraints they are faced with. Considering the fact that dairy farmer co-operatives can benefit the smallholder sector, the focus of this study therefore to generate information on whether co-operatives in the study area are able to promote smallholder dairy production and marketing by minimizing the numerous constraints and the high transaction costs that characterize this sector. The study will further contributing in investigating which policies can be put in place to help boost performance of dairy farmers as well as co-operatives in the process of improving smallholder production and marketing in the study area.

1.3 RESEARCH OBJECTIVES

The main purpose of the study is to assess the role that co-operatives play in the development of smallholder dairy farmers with respect to production and marketing the case of Biftu berga dairy cooperative union. The study has been guided by the following specific objectives:

- To examine the performance of dairy farmers participating in co-operatives
- To identify contribution of dairy cooperatives in reducing transaction costs of smallholder dairy farmers.
- To identify the dairy co-operative challenges and opportunities.

1.4 STATEMENT OF HYPOTHESIS

The hypotheses to be tested in the study are:

Hypothesis 1

Dairy co-operatives play a significant role in smallholder dairy production and marketing, resulting in a better level of performance in terms of yield/cow, productivity, marketing, income levels and better management practices to co-operative members.

Hypothesis 2:

Co-operative farmers incur lower transaction costs per unit of output sold indicated by a higher quantity of marketable surplus of milk.

1.5 SIGNIFICANT OF THE STUDY.

Dairy production is an important activity in Ethiopia. It provides income-generating opportunities for the rural and urban population and contributes to the nation's nutrition. As noted in the background, the study will provide useful information on whether co-operatives benefit smallholder dairy farmers in dealing with

challenges they are faced with. Assessing the role played by co-operatives, especially in the smallholder sector, is cardinal for the improvement of milk production and marketing in the country. Therefore, the study sheds light on whether dairy co-operatives do indeed contribute to smallholder dairy development with respect to production and marketing. Producer co-operatives are identified as being essential for dairy development and dairy farmers need to organize themselves to overcome the problems of accessing essential inputs, transport, processing and marketing of milk (Ortmann & King, 2007b:225) through reduction of transaction costs. This information is vital for policy makers to take appropriate action towards facilitating the establishment and development of more dairy co-operatives. Addressing constraints in the smallholder sector will enable more participation of farmers in markets and thereby satisfy the high demand for milk in the country. The dairy enterprise in the country has been seen to be profitable, especially for farmers who sell their produce via the informal marketing channel because of higher prices offered in such markets (MOA, 2008:20). However, smallholder farmers are unable to fully exploit from their dairy products, because of challenges in the smallholder sector. For them to realize the profitability of the dairy enterprise, they need considerable support from Government and other development agencies, such as NGOs. Development and implementation of policies as well as programs in the dairy industry to support the establishment, development and sustainability of co-operatives is imperative. This will help in increasing incomes because of guaranteed markets and access to adequate inputs. Therefore, minimization of constraints will help farmers to be more productive and will result in an increase in milk production which will in turn help to curb the severe milk shortage in the country. Literature indicates that effective co-operatives are those where external linkages play a major role. Satgar and Williams (2008:129) verify that farmer organizations require ongoing training and capacity building for them to be effective in playing their role. Therefore, by working together, Government, the private sector, NGOs and all stakeholders can provide services that co-operatives cannot provide through the

provision of a supportive environment for effective operation and management of co-operatives. Development of both physical and economic infrastructure is some of the services that can be provided to co-operatives in order to deal with challenges in the sector. This will facilitate improvement of dairy production and marketing through co-operative activity.

1.6 LIMITATIONS OF THE STUDY

The study was constrained by finances and time. Since, there was no money allocated for data collection or no fund was obtained from other sources. In addition, some of the respondents were reluctant to give out information about their production and marketing activities. Furthermore, the study found that the majority of farmers do not keep records. Hence, some of the collected information was based on recollection of recent events, such as procurement rates. The inputs provided by the farmers therefore could not be checked for authenticity.

1.7 ORGANIZATION OF THE REPORT

The study is organized into six chapters. The first chapter gives a brief background of the study, the problem statement, objectives, the hypothesis, the justification of the study and the methodology that was used in the study. The second chapter contains literature reviewed on the role of co-operatives in agricultural development and dairy production. The third chapter gives an overview of transaction costs, particularly in dairy farming. The results and discussions on household characteristics, dairy production and marketing are presented in Chapter four. Chapter five contains descriptive as well as econometric results on the effect of co-operatives on transaction costs. Finally, Chapter six gives a summary of the findings, conclusions as well as policy recommendations aimed at solving the current problems in the dairy industry.

CHAPTER TWO: METHODOLOGY

2.1 Description Of The Study Area

Biftu Berga Dairy Production and Marketing union is located in Oromiya National Regional State, West showa zone, Wolmera district, in the central highlands of Ethiopia. It is located at about 45 km west of Addis Ababa along the main road to Ambo. The area receives an average annual rainfall of around 1100 mm, more than 85% of which falls in the main rainy season (June to September). The altitude of the area ranges from 2200 – 2600 m above sea level (a.s.l), and the average annual temperature ranges from 6 – 21°C. The major crops grown include teff (*Eragrostis tef*), wheat, barley and faba bean. The woreda is characterized by a crop-livestock mixed farming system in which livestock in general and dairy production in particular contribute significantly to livelihoods. Biftu berga dairy production and marketing cooperative union was established seven years ago in October, 2008. Currently, the union covers three districts out of which two districts (Ejere and Ada'a barga) are belongs to west showa zone and the remaining one (Welmera) is currently located in Oromiya special zone surrounding Finfine. Currently the union has 13 primary dairy cooperative societies consisting of 645 household members (M 435 and 210) with an initial capital of 164,568birr. Nowadays, the milk is collected from member primary cooperatives and transported and delivered to large scale private processors in Addis. The union has also its own small scale processing equipments being supplied by NGOs like Self Help Africa and ACDI/VOCA. Major Current services provided by the union to its members include quality management and control, provision of concentrated feed, AI service, Veterinary drug, training, provision of market information and other similar related service. Biftu berga dairy union is purposively selected for this study due to its accessibility, potential of milk and availability of smallholder dairy farmers as well as relatively well developed infrastructure.

2.2 Methodology

This section presents the research methodology used to answer key study questions.

2.2.1 Sampling Procedure

Biftu Berga dairy production and marketing union was purposively taken for this study to assess the contribution of cooperatives in improving the smallholder dairy farmers in their production and marketing system. First a list of members and non members of the primary cooperative was obtained from the dairy union and from other reliable relevant sources. Then primary cooperative members were stratified into

three groups based on the district they are located. Next one from each member of primary cooperatives in each district was drawn purposively based on accessibility and ease for transportation. From each three primary cooperatives a total of 45 households were selected randomly using Probability Proportionate to Size (PPS). Similarly a total of 45 non member households were selected randomly from the village of three districts where the sampled primary cooperatives are situated. Based on this the total sample size for this study are 90 smallholder farmers.

Table 1.1: Profile of dairy farmers in the study area.

District	Name of cooperatives	Members	Non members
Welmera	jitu	58	203
	Biftu bakaka	31	145
	Loan Wayyaa	59	180
	Galgal	32	167
	Lalisa	26	152
Ejeree	Biru Tesfa	59	214
	Dhanga Kusa'e	20	155
	Dandi Gudina	76	230
	Galoo Gudina	32	146
	Abdi Gudina	137	321
Ada'a barga	Talila Barga	48	194
	Bilacha Barga	46	160
	Kalacha Booruu	24	89
		648	2356

Source: District co-operative promotion office.

The target population (smallholder farmers) was divided into two strata: co-operative members and non co-operative members. Farmers were then randomly selected from two lists to make up a sample size of 90 farmers. The co-operative farmer list used in the sampling process will be chosen from 3 Primary dairy co-operatives listed in the table above. The sample size is representative of the total population of smallholder dairy farmers in their respective district. It is evident from Table 1.1 that there are more

independent farmers compared to co- operative farmers in the study areas which can be attributed to the fact that most farmers prefer working alone rather than being part of a co-operative. However, for ease of analysis the same numbers of co-operative and independent farmers were used in the study. Hence, 45 independent and 45 co-operative member farmers made up the sample size of 90. The number of farmers interviewed in each area is given in table 1.2.

Table 1.2: Selected Cooperatives and sampled respondents.

Study area	Sampled co-operative members	Sampled non cooperative members
Jitu	18	16
Birehu tesfa	19	17
Kalacha Boru	8	12
	45	45

Source: Survey data, 2014

2.2.2 Data Collection

Relevant data were collected from both primary and secondary sources. Primary field surveys of sampled smallholder farmers who are co-operative and non co-operative members were conducted to gather information on their production and marketing activities through the use of a questionnaire. Data from secondary sources that include both published and unpublished documents were obtained from relevant sources including Internet.

Questionnaire development.

The study made use of primary data collected by means of structured questionnaire (Appendix A). Both open-ended and close-ended questions were used in the questionnaire. Data that were collected by using the questionnaire comprised of farmers' socio-economic characteristics, dairy production and marketing, input and output levels of milk, farm management practices, as well as income received from dairy

activity. The prepared, questionnaire was discussed with extension officers and relevant personnel before pre-tested to ensure validity and reliability of data to be collected. Five farmers were selected for pre-testing of the questionnaire. After approval of pre-testing, a face-to-face interviews were conducted to generate all the required data from farmers.

2.2.3 Data Analysis.

Primary and secondary data collected was analyzed using with the help of Microsoft excel the analysis was to characterize the sample households dairy production as well as marketing, while an econometric analysis was used to determine whether co-operatives have a positive influence on minimizing transaction costs.

Descriptive analysis

A descriptive analysis was used to compare characteristics of the different sampled households whereby frequencies, percentages, means and standard deviations were used to describe the socio-economic characteristics of smallholder farmers, dairy production and marketing, input and output levels, milk handling and farm management practices, as well as income received from dairy activity. Tables and figures were created to illustrate trends, especially in performance indicators, such as herd size, milk production and income levels among co-operative participants and non participants. This provides a general insight into how co-operative and non co-operative members differ in terms of their production and marketing behavior. In addition, the descriptive analysis of the effect of co-operative participation on transaction costs was done. This was made possible by analyzing problems and constraints, differences in location of farmers as well as differences in their marketing systems.

Econometric analysis

An econometric analysis was carried out to determine whether being a co-operative farmer has any positive influence on minimizing transaction costs incurred by smallholder dairy farmers. This was captured through the amount of milk farmers sell; whereby milk marketed by co-operative farmers is hypothesized to be higher than milk sold by independent farmers, hence co-operative farmers are perceived to incur lower transaction costs. A better understanding on the effect of co-operatives on transaction costs minimization will help in designing programs that will enable co-operatives to be more effective in improving smallholder dairy farmers' marketing activities. This is because particularly transaction costs are said to be the main inhibitor for smallholder farmers' marketing activities.

CHAPTER THREE: LITERATURE REVIEW

3.1 INTRODUCTION

The main objective of this study is to assess the role of co-operatives in dairy production and marketing activities. In order to analyze this role, the international experience with co-operative development and the role of these forms of horizontal co-ordination in assisting farmers' access to input and output markets as well as credit markets have to be studied. The purpose of this chapter therefore is to present a review of the international experience on the role played by co-operatives in dairy production and in the broader context of agricultural development as documented in secondary literature. Empirical studies on the role of co-operatives and their challenges are also presented in this chapter.

3.2 OVERVIEW OF ISSUES CONCERNING CO-OPERATIVES

3.2.1 Defining co-operatives

The International Co-operative Association (1995) defines a co-operative as an autonomous association of people united voluntarily to meet their common economic, social and cultural needs as well as aspirations

through a jointly-owned and democratically-controlled enterprise. The definition of co-operatives implies that firstly, they are formed by groups of people who have a specified common need or problem. Secondly, the organisation is formed freely by members after contributing to its assets. Thirdly, the organization is formed and governed democratically so as to achieve desired objectives. Fourthly and lastly, the organization is an independent enterprise promoted, owned and controlled by its members to meet their needs. According to Galor (2003:1), co-operatives are economic enterprises that are initiated by their members and belong entirely to their members. These enterprises are formed with the intention of providing the best possible services at the lowest possible cost to their members when markets fail to provide required goods and services at affordable prices and acceptable quality. Co-operatives can be formed in any sector of the economy and they vary greatly in terms of size and scale with regard to the functions they perform (Rondot & Collion, 2001:2). They can operate at village level, regional and even national levels. Like all forms of businesses, co-operatives are also guided by a set of principles that were first set out by the Rochdale Society of Equitable pioneers in 1844 (Ortmann & King, 2007a:41; Rheingold 2008:2). These principles are universally applicable to all co-operatives. Co-operatives differ from other organizations in the sense that profit is returned as benefits, depending on the type and structure of the co-operative (Suber, 2005:5). Member benefits are relative to the amount that a member utilizes the co-operative services. Generally, benefits include quality supplies at discount rates, increased market power; a share of the earnings relative to the percent of business performed with the co- operative as well as increased economic activity within the local community.

3.2.2 History of co-operatives.

According to Shiferaw et al. (2006:5), farmer co-operatives were historically introduced in Sub-Saharan Africa (SSA) during the colonial period for promoting the production of cash crops by peasant farmers. After independence, a number of governments, including donors, promoted co-operatives and other rural

organizations as a potential source of decentralized grassroots participation in agricultural credit, input and commodity markets (Ortmann & King, 2007a:44). The performances of cooperatives were mixed and this was attributed to technological problems and poor management. Generally, co-operatives were controlled by government hence being considered as an extended arm of government and not as institutions that can help farmers in accessing markets as well as required inputs (Satgar & Williams, 2008:5). The political interference by governments also contributed to co-operatives' poor performance. However, in the 1980s, the situation changed in the sense that economic liberalization opened up new opportunities for producers to be actively involved in organizations that they owned (World Bank, 2008:154). This led to reconsideration of the role of co-operatives in development despite past failures and bitter experiences (Kodama, 2007:87).

3.3 RATIONALE FOR THE ESTABLISHMENT OF CO-OPERATIVES

Improvement in the ability of poor smallholder farmers to participate in markets is a serious challenge in most developing countries. This problem is especially acute in the SSA region, given the dominance of smallholders in the agricultural sector (Onumah, Davis, Kleih & Proctor, 2007:3). Evidence suggests that the proportion of farmers engaged in subsistence agriculture in this region is still high because of high transaction costs that inhibit them from participating in markets (Bernard, Gabre-Madhin & Taffesse, 2007:1). They lack essential inputs and improved technologies preventing them from improving their production as well as participating in markets. Development programs designed in developing countries to develop smallholder farmers are unable to do so especially at the initial stages. The difficulties farmers face in accessing markets where they can acquire agricultural inputs as well as sell their produce are major inhibiting factors in improving their livelihoods and levels of production (Sinja, et al., 2006:2-3). Farmers who can produce a surplus are also unable to sell their produce because of a lack of access to profitable

markets which then forces farmers to sell at the farm gate or to sell to convenient buyers and at any price that the buyer offers. Markets supporting institutional arrangements, such as farmer organizations, have been proposed as having the potential to bridge market imperfections and promote co-ordination in markets for enhancement of opportunities for the poor in markets. Over the past decade, donors and governments have revived interest in collective action mechanisms to overcome smallholder marketing constraints as well as ensuring that they realize the perceived benefits (Bernard & Spielman, 2008:60; Collion & Rondot, 2001:1). This interest is due to the fact that governments and donors have realized the usefulness of these organizations, especially as a medium for sustainable development. Moreover, the renewed interest is to a certain extent in response to changes that have occurred in the global agricultural economy that have presented rural producers with both new challenges and opportunities (Hellin, Lundy, & Meijer, 2007:2-3). This is of significant importance, especially for high-value product farmers who are constrained by high transaction costs. Because of these challenges, co-operatives and other farmer organizations have been suggested as institutional innovations that can contribute to the development of production and marketing activities in the smallholder sector (Abdulai & Birachi, 2008:119; Shiferaw, et al., 2006:3) by enhancing market participation through collective action. They have been viewed as appropriate in reaching the poor smallholder farmers because of being owned and controlled by smallholder farmers when other development programs have failed to do so. They present significant institutional change believed to change economic opportunities available to smallholder farmers by production improvement through better access to necessary inputs, better technologies and access markets (Negassa, 2009:3).

3.4 CONTRIBUTION OF CO-OPERATIVES TO AGRICULTURAL DEVELOPMENT

Agriculture is considered to be one of the important vehicles for realizing Millennium Development Goals (MDGs), which are intended to halve the number of people suffering from intense poverty and hunger (World Bank, 2008:1). Statistics indicate that three out of four poor people in developing countries live in rural areas and depend directly or indirectly on agriculture for their livelihood (Rondot & Collion, 2001:1). Thus, in much of SSA, agriculture is a strong option for encouraging growth, overcoming poverty and enhancing food security. However, considerable development that has taken place especially in agriculture has not offered a lot of benefits to rural poor people and has not made a significant impact on alleviating rural poverty (Pinto, 2009:3). These people constitute the smallholder sector in developing countries which in most cases is left without any effective support that offers rural people new opportunities to move out of poverty. Dorward, Chirwa Kachule, Kumwenda, Kydd, Poole, Poulton, Stockbridge (2005:1) acknowledge that recent years have indeed seen extensive interest in farmer organisations, which includes co-operatives and other collective marketing associations, as instruments for supporting agricultural development. A number of countries have called for more comprehensive measures to overcome problems hindering smallholder market access. Such measures include increased investment in infrastructure, in market institutions and in agricultural research and extension services, together with a greater role for producer groups (World Bank, 2002:18). Hence, most countries' policies and development strategies now reveal a strong emphasis on promotion of farmer associations in order to facilitate farmer access to inputs, credit, output markets, market research, technical training and to improve co-ordination within the smallholder sector. The role played by co-operatives is evident and more significant in the agricultural sector than any other sector. This is because, as an area of productive activity, the agricultural sector has some sector-specific attributes that distinguish it from other sectors (Valentinov, 2007:57). Agriculture is an asset-specific sector and agricultural production is also dependent

on nature, including biological and climatic factors. The high reliance on nature implies that farmers have relatively low control over production processes which puts them at a disadvantage (Valentinov, 2007:57-59). Because of their advantages, co-operatives help farmers to compensate for the problems encountered in this sector and have appeared to generate systematic incentives for farmers to form co-operatives. Consequently, the co-operative sector is now a widespread phenomenon in both developed and developing countries, especially in the agricultural sector. They are viewed as instruments that can help achieve the productivity revolution in the smallholder sector. Similarly, the importance of the role played by co-operatives in agricultural development is demonstrated by the fact that the co-operative sector in most developing countries has been viewed as a potential significant contributor towards the realisation of MDGs (Francesconi, 2006:2). Co-operatives in the agricultural sector are considered to be the most important organisations that pay attention and try to support rural development in general as well as agricultural development, especially through activities and services intended for farmers. They have mainly contributed to the agricultural sector by raising productivity, linking farmers to markets, reducing risk and vulnerability, facilitating agricultural entry and exit as well as increasing farm income and enhancing environmental stability. Pur, Gwary and Gaya (2003:2) reveal that a review of co-operatives' role at an international level indicates that they play a vital role in all aspects of agricultural production which can range from the land clearing to the consumption stage.

3.4.1 Raising agricultural productivity

Co-operatives play a major role in raising agricultural productivity through the various activities they undertake. One way in which they raise agricultural production is through the provision of necessary inputs and services to smallholder farmers. This places farmers at a better position to operate efficiently because they can organize more resources than they would otherwise be able to achieve in an individual capacity and are thus able to improve their productivity. Pur et al., (2003:2) describe co-operatives as a

medium through which services, such as the provision of farm inputs, farm implements, farm mechanization, agricultural loans, agricultural extension, members' education, marketing of members' farm produce and other economic activities and services, are rendered to members.

Through timely delivery of agricultural inputs and services required, farmers are able to improve their productivity and produce good quality products, increase farm income and become more competitive (Pur, et al.,2003:2). Inputs are usually not easily accessible and transport costs are high, and co-operatives have made it possible for collective buying of inputs and lowering transportation costs. In other words, co-operatives form a link between farmers and input dealers, enabling easy access of inputs. This accelerates transformation of agriculture and rural economic development because it brings about productivity improvement in the agricultural sector through improved access to inputs as well as service delivery. On the other hand, co-operatives have also played a major role in agricultural development through the improvement of access to credit by farmers. This has been made possible by enabling the poor to access reasonably priced credit at terms and conditions favourable to them (Hovhannisyan, Urutyan & Dunn, 2004:5). As a result, production has increased in the smallholder sector, when considering that a large number of farmers without land titles or any form of security usually find it difficult to access credit. Thus co-operatives offer smallholder farmers the opportunity to access credit affordable to them which is vital for the development of the rural economy as well as helping the rural poor build assets (World Bank, 2009:23). Improved access to finance facilitates the use of purchased inputs, including mechanization, which is thus an improvement in agricultural production. Co-operatives provide education and support to farmers, improving their managerial capacity as well as enhancing the competitiveness of the agricultural sector. They promote capacity building and human capital investment through member training and education programmes in a variety of topics depending on members' needs (Satgar & Williams, 2008:23). As a result of globalization, farmers are forced to become more Competitive and this is through education

and training. Education and training provided by co-operatives help to facilitate dissemination and adoption of new technologies by farmers (Kariuki & Place, 2005:4). This positively improves agricultural production.

3.4.2 Linking farmers to markets:

Farmers come together for the main purpose of marketing their product and co-operatives have always been an important vehicle for collective marketing and thereby strengthening farmers' links to markets. Provision of an assured marketing outlet sufficient to producers is an essential condition of increased production which, in most cases, acts as an incentive for farmers to participate in co-operatives (Ayenew, Wurzinger, Tegegne & Zollitsch, 2009:2). This implies that farmers can avoid market imperfections through co-operatives that help co-ordinate markets. For instance, experience in Uganda and Kenya has pointed to marketing outlets being a key initiator of milk production by smallholders. As far as development is concerned, co-operatives have expanded modern markets in rural areas by providing a ready market for farmers' produce and absorbing transaction costs that hinder smallholder farmers from market participation (Holloway, Nicholson & Delgado, 1999:10). This has generated a high income for farmers through the marketing of their produce in markets that they previously had no access to (Ortmann & King 2007a:44). This is particularly the case for traditional commodities that still play a major role in many developing country economies and offer substantial opportunities for future growth (World Bank, 2009:22). The co-operative sector also makes a contribution to infrastructure development which enables the linking of farmers to markets (Bienabe & Sautier, 2005:4; Kariuki & Place, 2005:4; Negassa, 2009:3). The smallholder sector is characterised by poor roads, poor communication facilities, unavailability of storage facilities and poor market infrastructure leading to post harvest losses. Market failures caused by asymmetric information and high transaction costs are more pronounced in areas with underdeveloped road and communication networks and other market infrastructure (Shiferaw, et al., 2006:6). Cooperatives

have assisted in development of rural markets that provide farmers with a ready market for their produce hence enable farmers minimize costs associated with travelling to distant markets. They have also contributed in investment of primary processing facilities through pooling of resources to allow for value addition. In addition, the worldwide food and financial crisis poses many challenges for the agri food sector especially in developing countries (Prakash, 2000:2). The demand for high value products is rapidly increasing, driven by rising incomes and faster urbanization. This has presented a number of expanding opportunities as well as challenges for smallholder farmers because they are encouraged to venture into high value markets yet their produce has to meet certain qualities, standards and timeliness in delivery (World Bank, 2009:22). Because of poor infrastructure, inadequate support services and weak institutions, farmers are unable to participate in the high value markets. Applying grades and standards require investments in training, equipment, infrastructure and monitoring systems, which can be afforded by larger organizations. Co-operatives therefore have made it possible for farmers to integrate into such markets through the provision of necessary inputs and equipment, technical knowledge as well as market information necessary for accessing high value product markets. Shiferaw et al. (2006:10) acknowledge that the ability of smallholder farmers to participate and compete in high value markets is a determining factor for agricultural growth, especially in developing countries because of better economic opportunities offered to them. However, in order for co-operatives to promote the participation of smallholder farmers to markets, it is critical to ensure effective horizontal co-ordination. According to Poulton and Lyne (2005:126), horizontal co-ordination can range from informal arrangements between farmers to co-ordinate procurement of inputs and sales, to groups formally constituted for facilitation of collective action (e.g. farmer associations and organizations, co-operatives). Therefore, through collective action facilitated by horizontal co-ordination, co-operatives place farmers in a better position to improve their market access as well as strengthen their market power.

3.4.3 Improvement of market information

The availability of market information is limited in developing countries. This is due to the fact that the acquisition, collection and processing of required information is costly leading to asymmetric information, especially in the smallholder sector (Shiferaw, et al., 2006:5). As a result of their limited resources to access market information, smallholder farmers are placed at a disadvantage because they are inhibited from having access to markets. Co-operatives are able to bridge the information gap by obtaining, interpreting and disseminating information about both inputs and output markets, thereby enabling productivity increase, which is a positive contribution to agricultural development. Timely access to market information can dramatically improve the price discovery process of farmers, reducing local market instability as well as post harvest losses (Lapar, et al., 2006:4). This has a positive effect on improving market access by farmers and enables them to make better and informed decisions.

3.4.4 Improvement of bargaining power:

Co-operatives also have a positive influence in strengthening the bargaining power of farmers (Ortmann & King, 2007a:43). They make farmers' voices heard in decision-making processes in policies that affect the context in which they produce, transform and market their products. In larger numbers, farmers have a more effective input in decision-making processes that affect their lives, rather than in operating as individuals. In developed countries, such as the United States of America, co-operatives have developed to become a significant force in agriculture and play an important role in influencing national agricultural policies (Cropp & Graff, 2001:11). Improving the bargaining power of farmers has a positive influence in the development of the smallholder sector as well as the agricultural sector as a whole.

3.4.5 Employment creation.

The agricultural sector absorbs a great deal of labour in developing countries and statistics indicate that 35 % of the population is employed either directly or indirectly in the agricultural sector (Pinto, 2009:3). Co-operatives contribute to employment creation in the agricultural sector as well as to other sectors of the economy. They employ a large number of people; generate and enhance income, improve viability of business activities; and thus have significant potential in eradicating poverty, enhancing empowerment and creating jobs. Where there is a well functioning co-operative organization, at least two people are employed directly and many others are indirectly employed. The United Nations (UN) in 1994 estimated that the livelihood of nearly three billion people was made secure by co-operative enterprises. For instance in Kenya, the co-operative sector employs over 250 000 people (Satgar & Williams, 2008:16), which is very significant in contributing to development. It is thus evident that co-operatives play an important role in agricultural development and the next section reviews literature on the role of co-operatives in dairy development.

3.5 THE ROLE OF DAIRY CO-OPERATIVES.

Dairy farming plays a key role in the socio economic status of the large percentage of rural people especially in developing countries through provision of employment opportunities as well as supplementary income to the rural poor. However, evidence indicates that the proportion of dairy farmers engaged in subsistence agriculture in the developing world is still high despite the rapid increase in demand of livestock products (Bernard, et al., 2007:1). As a result, many countries are attempting to increase milk production by assisting small-scale farmers to integrate in markets since they are the most numerous and poorest of the farmer population as a whole (Negassa, 2009:3). This has an impact on the provision of rural employment, increase in income and diversification away from traditional production to

modern systems of production. Therefore, the co-operative system has proved to be an effective vehicle for dairy development, particularly in rural areas (Sinja, et al., 2006:2; Lapar, et al., 2006:3). It has featured prominently in dairy development worldwide because of the range of skills involved in milk production and marketing that require a number of activities that can best be provided through collective action, thus through co-operatives. The role of co-operatives in dairy production is evident in the following ways:

3.5.1 Improvement in milk production.

Co-operatives have played a vital role in fostering dairy development in a number of countries in the developing world, particularly by providing a stable market environment and delivering necessary farmer services for smallholder dairy farmers (Sulastri & Marhajan, 2002:18). This has been made possible through the development of informal or traditional marketing channels which co-operatives have contributed to, and these markets are dominated by smallholder farmers. They control approximately 80 % of marketed milk in many countries in SSA, South Asia and Latin America (FAO, 2001:146). Examples include Kenya (86 %), Tanzania (98 %) and India (83 %). Dairy development through co-operatives is considered to be the most effective strategy for supporting smallholder dairy farmers, which is made possible by providing a guaranteed market for milk; supplying feed at reasonable prices as well as provision of other services such as milk collection, provision of credit, veterinary aid, and artificial insemination (Holloway, et al., 1999:10). Access to necessary inputs and services is a major contributor to increase and sustain milk production. An increase in milk production has a positive influence in income generation which encourages farmers to invest in better dairy technology, such as improved dairy breeds and better feed, resulting in milk production being more profitable. Farmers produce better feeds and improve housing and care for their animals, which contribute to dairy development and hence an increase

in milk production. In addition, many smallholder farmers still practice or use low levels of technology. They are unable to adopt new production technologies that demand higher investment, given their limited financial resources and skills. Although the adoption of improved production technologies has a positive effect on milk production, it does require high investment. Co-operatives have played a pioneering role in introducing modern technologies to help farmers increase production and maximize their returns (Lapar, et al., 2006:2). They have facilitated in the dissemination and adoption of new technologies through education and training provided to farmers. The adoption of modern technologies for milk conservation, transportation and processing has benefited smallholder farmers through the maximization of their returns from increased milk productivity.

3.5.2 Improvement in milk marketing.

The marketing of milk presents serious challenges for smallholder dairy farmers because of its unique features that require special co-ordination in markets as compared to other agricultural products. According to Wolf and Hamm (2001:3) and Hovhannisyanyan et al. (2004:3), milk has three special attributes that distinguish its marketing from other agricultural products. Firstly, milk is a perishable product and, unlike other agricultural products, it can only be stored for a few days in its liquid state. Secondly, most agricultural products are harvested once a year and can be stored for later sales whereas milk is normally harvested twice a day. Thirdly, the supply and demand of milk is counter-cyclical over the year. These attributes are evidence that milk requires a secure market and co-operatives have proven to be a provider of such an assured milk market, as observed in countries like India, Kenya and Uganda (Staal, Thorpe, Muriuki, Omore, & Owango, 2000:5). Moreover, these special attributes of milk contribute to high transaction costs in dairy production and marketing because of the high marketing costs for fluid milk, scattered nature of fluid milk markets and the risk attached to marketing milk as a perishable product (Holloway, et al., 1999:5). Because of its perishable nature, milk requires rapid transportation to the

market in order to avoid losses arising from spoilages. Farmers lack post harvest infrastructure such as chilling facilities to keep milk in good condition hence the need for rapid transportation of milk to the market (Kariuki & Place, 2005:9). This results in high transaction costs which negatively affect farmers' decision to participate in markets, thus limiting them from accessing markets (Abdulai & Birachi, 2008:104; Staal, Delgado & Nicholson, 1997:780). In this regard, co-operatives play a central role in minimizing transaction costs in dairy production because they improve market participation by overcoming barriers to assets, information, necessary services and, most importantly, by overcoming barriers to markets within which smallholders wish to sell their milk (Lapar, et al., 2006:6). Co-operatives therefore improve the marketing of milk through the minimization of transaction costs associated with marketing milk as a perishable product. Co-operatives provide a reliable market outlet to dairy farmers and they have the advantage in the collective marketing of milk which significantly lowers transaction costs among smallholder farmers (Hovhannisyanyan, et al., 2004:5). The provision of a reliable market outlet that is sufficiently rewarding for farmers acts as a stimulator for milk production and co-operatives provide more marketing options to farmers. This in turn brings about major improvements in the production and marketing of milk as well as changes in consumption behavior of smallholder households since they consume a higher percentage of their produce (Ayenewu, et al., 2009:2). Co-operatives also enable value addition through the processing of milk into less perishable products which assists farmers in selling directly to final consumers, thereby earning more profit. Improvement in market access encourages more intensive dairy production in the form of improved dairy breeds and improved feed technologies that enable smallholder farmers to increase their income and employment, which in turn leads to improvement in the welfares of families, including those of women and children (Staal, et al., 2000:9). An example of successful co-operatives in the dairy industry is found in India. More than 70% of India's milk is produced by households owning only one or two dairy animals and these producers form part of a nationwide

network of dairy co-operatives (FAO, 2004:24). Transaction costs in milk production will be discussed in detail in the next chapter.

3.5.3 Improving food safety and standards

Increasing food safety concerns over the effects on health and recent global concerns have led to a growing interest among consumers in food safety assurances and traceability of products offered by farmers (Francesconi & Ruben, 2007:12). As one of their advantages, co-operatives have made it possible for dairy farmers to produce good quality milk and dairy products as independent farmers are often unable to meet food safety and quality control requirements because of poor milk handling techniques and technology used. Smallholders do not usually have chilling or processing facilities because of extreme poverty, low asset base and no access to finance. Co-operatives can thus provide farmers with such facilities. To ensure good quality products and safety, milk from farmers is tested on a daily basis, which forces farmers to use appropriate milk handling techniques for which they are given appropriate training. In addition, co-operatives have played a role in undertaking more farmer-oriented research which has expanded dairy education and extension services, and enhanced government role in integrated dairy development (Sulastri & Marhajan, 2002:17). They have played an important role in providing a base for farmer service delivery and for generally stable agricultural knowledge systems. In short, co-operatives play a major role as a source of market information for dairy farmers. Access to market information improves decision making by farmers and enhances market participation. Access to such information improves production practices to prevent, eliminate or reduce food safety hazards on the farm. According to Valeev (2005:620), these practices include particularly husbandry and management practices such as feed production, cattle movement and traceability, health and treatment, milking procedures, maintenance of milking equipment, dairy cattle housing, water management, hygiene level on the farm, as well as

transport of raw milk to selling points. Evidence suggests that farmers with limited access to this information are less likely to adopt standards.

3.6 CO-OPERATIVES IN ETHIOPIA.

Traditional cooperatives associations existed in Ethiopian society centuries ago in the form of iqub and idir. Iqub is an association of people having common objectives of mobilizing resources, especially finance, and distributing it to members on rotating basis. Idir is an association of people that have the objective of providing social and economic insurance for the members in the events of death, accident, damages to property, among others. In the case of funeral, Idir serves as funeral insurance where community members elect their leaders, contribute resources either in kind or in cash and support the mourning member. However, the history of formal cooperatives in Ethiopia dates back to 1960, when the first directive of cooperatives was enacted. Since the introduction of the cooperative directive, Ethiopia has enacted four new proclamations and an amendment act: Directive No.44/1960, Proclamation No.241/1966; Proclamation No.138/1978, Proclamation No. 85/1995, Proclamation No. 147/1998, and Amendment act No. 402/2004. The latest proclamation ensures that cooperative policy is fully consistent with the Universal Cooperative Principles and the ILO's Promotion of Cooperatives Recommendation 193 (2002). Aside from enacting cooperatives proclamations, Ethiopia has formulated a five year cooperative development programme. This demonstrates that the federal and regional governments have realized the contribution of cooperatives to economic and social development, food security and poverty reduction in Ethiopia. However, at the district level - where most decision making on capacity building programmes, budgeting and resources allocation takes place - lack of awareness about the role of cooperatives in economic and social development, and lack of awareness regarding cooperative law has made it difficult for integrated promotion of cooperatives in all sectors.

3.6.1 Cooperative Development Policy in Ethiopia.

The recognition that cooperatives have received has depended on the policy of the governing regime in Ethiopia. During Emperor Haile Selassie's regime (before 1974), cooperatives were few in number and were less recognized. They were mainly engaged in production of industrial crops, such as tea and spices. Members of cooperatives during this period included just a few producers of these crops and land owners. The Derg (1974-1991) and the current governments of Ethiopia have given special recognition to the cooperatives in Ethiopia. The Derg regime considered cooperatives as a mass movement that could ensure equitable mobilization and distribution of resources. They were thus viewed as instruments for planning and implementation of socialist policies. Cooperatives were, therefore, established to achieve these objectives. It was in the same vein that cooperatives would also be used as a means to mobilize community support for the ruling party. During the Derg regime, this was more conspicuous as cooperatives were forced to operate in line with socialist principle, where production and marketing of produce were done collectively and members pooled their land resources under communal tenure. With the downfall of the Derg regime, most rural based cooperatives were abolished by members and their resources were looted and misused. The current regime gave no attention to cooperatives during the transition period, meaning that cooperatives were relatively stagnant between 1991 and 1993. Since then the government has acted as a facilitator for cooperative development. This involves enacting legislation, developing cooperative policy and maintaining law and order. Generally the role of government should be more oriented towards support than control. However, in practice this is hardly possible in Ethiopia. The frequent restructuring of government institutions involved in cooperative promotion has quite often hindered the growth and development of cooperatives. In cognizance of the importance of cooperatives for economic development in Ethiopia, the Government of Ethiopia has increased its involvement in cooperative development through policy formulation, including a five year cooperative development plan

and many proclamations on cooperatives. It enacted cooperative proclamations and established federal and regional government institutions that promote and support the cooperative movement. To improve cooperatives' functionality and operational efficiency, FCA has prepared 18 guidelines, five operational manuals and ten by-laws to guide cooperative development. Increased involvement of the Government is based on the premise that the cooperative movement can mobilize human and financial resources to enhance economic and social development through production, marketing, processing and distribution of commodities. It is in this regard that the Government attempts to use cooperatives as an instrument to achieve its poverty reduction strategy. For instance, in the 'Plan for Accelerated and Sustainable Development to End Poverty' (PASDEP) it was planned to increase the number of beneficiaries receiving services from cooperatives from 30 per cent in 2004/05 to 70 per cent in 2009/10. To achieve this target, it envisaged to assign 5,000 development agents to support cooperatives during the PASDEP period. It aimed to increase the number of primary cooperatives to 24,677 and the number of cooperative unions to 646. The policy and strategy document of PASDEP outlines the different types of cooperatives to be organized and the type of supports that will be provided to cooperatives, including training, technical support, loan provision and networking. The institutions of government were also to create links with international organizations to support cooperative development. A typical example come from the Rural Finance Intermediation Programme (RUFIP), which was designed by the Federal Cooperative Agency and funded by International Fund for Agricultural Development (IFAD) and the African Development Bank, to build the capacity of cooperatives involved in rural financial services.

3.6.2. Dairy Co-operatives and Their Role.

It has been estimated by Staal, Pratt & Jabbar (2005:13) that milk demand in developing countries will more than double by 2020 due to population growth and urbanization. The emphasis of milk co-operatives is to support smallholders to stimulate economic growth and reduce poverty in rural areas, thereby

contributing to income and employment generation in the smallholder sector. This is because large-scale farmers are not faced with the same problems smallholder farmers are faced with in the industry and even if they are, better equipped to withstand risks. Further, smallholder farmers are considered to be the basis of dairy development and hence the focus of development is on them. The ever-increasing demand for milk and the dependence on imports have stimulated a renewed interest to promote more dairy cooperatives as mechanisms that will improve milk production and marketing in the country.

The theory of cooperative organization provides several reasons why farmers join the cooperatives. According to Schroeder (1992), cooperatives provide quality supplies and service to the farmers at a reasonable cost. By purchasing supplies as a group, the farmers offset the market power advantage of other private firms providing those supplies. The farmers can gain access to volume discounts and negotiate from a position of greater strength for better delivery terms, credit terms, and other arrangements. Suppliers will also be more willing to discuss customizing products and services to meet farmers' specifications if the cooperative provides them sufficient volume to justify the extra time and expense. Increased farmers bargaining power in the market places is the other advantage of the cooperative. Marketing on a cooperative basis permits farmers to combine their strength and gain more income. The farmers can lower distribution costs, conduct joint product promotion, and develop the ability to deliver their products in the amounts and types that will attract better offers from purchasers. According to Parliament *et al* (1990), a cooperative gives farmers a means to organize for effective political action. Farmers can meet to develop priorities and strategies. They can send representatives to meet with legislators and regulators. These persons will have more influence because they will be speaking for many, not just for themselves. According to Folsom (2002), having a businesses owned and controlled on a cooperative basis helps farmers' entire community. Cooperatives generate jobs and business earnings for local residents. They pay taxes that help to finance schools, hospitals, and other community services.

According to Koopmans (2006), farmers may have several specific reasons for starting an agricultural cooperative: to mobilize more resources than they can individually supply, to create attractive alternatives for purchasing goods and services, to operate a business more efficiently than can be done on an individual basis, because they recognize that the benefits outweigh the duties of membership and because they recognize that as members of a cooperative they are part owners and not only clients. By becoming a member of a cooperative, each farmer can make use of the advantages of the cooperative: a good market price for their product and access to other goods, services, markets and credit.

3.7 COMMON CHALLENGES FACED BY CO-OPERATIVES.

There are a number of challenges that have contributed to co-operatives' lack of success, especially in developing countries, despite the fact that they play a significant role in development. Most co-operatives have failed to improve their performance because they do not have enough resources to make a difference (Pur, *et al.*, 2003:5; Chambo, 2009:10). For instance, they lack access to financial resources to help them expand their business which inhibits their investment opportunities in better technologies. Often, credit awarded to them is insufficient to meet the financial needs of the organisation. In addition to this, co-operatives are constrained by limited economic benefits for their members yet the entire business revolves around economic benefits that members expect from the co-operatives, especially for agriculture co-operatives (Prakash, 2000:8). This discourages member participation and erodes confidence in leadership of the cooperative. The incentive structure for attracting membership remains marginal because of the limited economic benefits (Chambo, 2009:11). This has led to co-operatives being unable to attract the right leadership and management due to a lack of incentives, and thus poor management is another challenge faced by co-operatives. Furthermore, member education and training has not been effective in giving members the right skills and knowledge of bringing about significant change to their lives through their co-operatives (Bienabe & Sautier, 2005:8). The implementation of programs such as good

governance, transparency, accountability as well as member participation is put under strain, leading to poor performance of co-operatives. Further, co-operatives cannot fully achieve their set goals because of a lack of support required from government and development agencies. Other co-operative challenges include poor management, lack of member commitment and participation, restrictive government policies, as well as poor governance resulting in corruption. For them to be effective, co-operatives need to be managed with minimal government involvement and be provided with all the support they require, such as a favorable policy environment, infrastructure development and capacity building.

3.8 Empirical Studies On The Role Of Co-Operatives And Their Challenges.

There is little empirical evidence available to support the role of cooperatives in smallholder dairy production and in agricultural development as a whole. However, international experience on the role co-operatives can play, especially in the smallholder subsector, will be used. The role of co-operatives as well as their performance has always been of considerable interest in agriculture economics, mainly because of the importance of co-operatives in both developed and developing countries.

3.8.1 Production and Marketing.

Ghosh and Maharjan (2004), in their study on the role of co-operatives and their impact on milk production and household income, discovered that co-operatives play a role in significantly improving milk produced by member farmers as well as the price received by smallholder farmers, made possible by access to necessary inputs and improved husbandry practices. This has contributed to a higher income by co-operative farmers because of improved milk sales which has stimulated the building of household assets. The study is in line with a study conducted by Sulastris and Marhajan (2002), where it was found that co-operatives improve income generation by farmer members, made possible by the improvement of investment opportunities. The results further revealed that through collective purchasing of inputs, farmers purchase inputs at lower prices. The study recommended that the government needs to be actively

involved in cow insurance programs in order to attain sustainable dairy development that will be used as an effective instrument for rural employment and rural development as a whole. In addition, the study recommended that fair pricing of milk is needed in order to create a balance between the interest of the consumer and that of the dairy farmer. In addition, Kariuki and Place (2005) also discovered in their study that co-operatives play an important role in sharing new ideas, building the confidence of farmers and establishing networks based on trust. Co-operatives also facilitate access to credit because farmers can jointly raise collateral to secure a required loan from financial institutions, which is almost impossible when farmers operate individually. Hovhannisyán *et al.* (2004) analysed the role of co-operatives in milk marketing and, in their study, they discovered that co-operatives play a positive role in herd size and milk produced and marketed by Armenian smallholder farmers. This was attributed to improved training regarding feeding, artificial insemination sanitation programs as well as the support in feed procurement by the co-operative. In addition, the study concluded that cooperatives increase sale opportunities of farmers because they have the potential to sell to distant and more lucrative markets which in turn results in higher farmers' incomes. Hence, training of both members and leaders is of paramount importance to improve the performance of co-operatives. The study also recommended that there is a need for vertical integration in milk processing among co-operatives for the purpose of capturing a greater share of consumers' food expenditures. On another note, Shiferaw *et al.* (2006) discovered that co-operatives and other producer organisations have the potential to simplify and shorten marketing channels by directly linking smallholder farmers to secondary and tertiary markets, to better co-ordinate production and marketing and to facilitate access of smallholder farmers to essential inputs at reasonable prices. They also discovered that the effectiveness of co-operatives in performing their role is dependent on improved participation in decision-making by members, improved governance as well as improved external support. The study on the impact of co-operatives on the commercialization of smallholder dairy farmers

conducted by Bernard *et al.* (2007) in Kenya concluded that co-operatives do serve their expected role in the commercialization of smallholder farmers. This is made possible through higher prices offered to farmers for their produce, improved bargaining power and better market opportunities provided by co-operatives. However, the study revealed that the impact of co-operative membership is heterogeneous, in the sense that households benefit differently from co-operative participation. The results particularly indicate that smaller farmers tend to sell less of their marketable surplus as a result of higher prices, while larger farmers sell more. This is mainly because poorer farm households typically face food shortages. Consequently, when facing a price increase which allows them to cover their liquidity needs with a lower quantity of output, these farmers will reduce the portion of marketed output and increase their consumption levels. An increase in price for larger farmers who are already able to fully cover their consumption needs results in an increase in marketed surplus. On the other hand, the study indicates that co-operatives are not adequate in effectively supporting smallholder commercialization hence corresponding institutions are a necessity to address specific needs of smallholder farmers. The study is also supported by a study conducted by Francesconi and Ruben (2007) on the impacts of collective action on smallholder commercialization. Francesconi and Ruben evaluated seven indicators, namely co-operative size, market access, herd size and productivity, nutritive value and hygiene at farm level. Empirical findings suggested that co-operatives do indeed play a role in the improvement of members' market access and herd size, differentiated by high productivity. Negassa (2009) studied the improvement of smallholder farmers' marketed supply and market access for dairy products and established that co-operative participation by smallholder dairy farmers play a significant role in their decision to participate in markets as well as determine the level of their participation in those markets. This was shown by the significant increase in milk produced and sold by co-operative farmers compared to non co-operative members. However, a shortage of milk supply was found to be a major inhibitor of co-operative performance because it limits

the marketing activities of cooperatives. Consequently, the scaling up of marketing activities was recommended through an increase in membership and collection centers.

3.8.2 Innovation.

The role of dairy marketing co-operatives in the Ethiopian dairy innovation system was studied by Tefera (2008). Results of the study indicated that co-operatives can play a significant role in promoting technological, organizational and institutional innovations, promoting linkages for access to services and marketing as well as in knowledge and information sharing. However, Tefera discovered that the performance of co-operatives was inhibited by mismanagement on the part of co-operative leadership. Co-operatives on their own are not sufficient in effectively promoting smallholder production and marketing activities; however complementary organizations are necessary to assist in specifically addressing needs of smallholder farmers. The study recommended that governments and development agents should focus on helping co-operatives to organize their own resources in order to enhance their ability to obtain information on improved practices and not to see their role as simply transferring technology and information to farmers.

3.8.3 Transaction Costs.

A study on the role of collective action in overcoming market access barriers by smallholder farmers was undertaken by Lapar *et al.* (2006). The findings indicated that institutional arrangements such as co-operatives can facilitate a reduction in transaction costs in smallholder production and marketing to enhance market participation. Specifically, the study discovered that co-operatives can reduce information asymmetries, reduce transport and communication costs, as well as address non-economic barriers. Nevertheless, co-operatives need to be supported by governments through the creation of a favorable policy environment to help smallholder farmers to overcome barriers to market participation. Ginder, Hueth and Marcoul (2005) conducted a qualitative study on co-operatives and contracting in agriculture.

The study revealed that being in a co-operative; farmers are able to secure contracts with large buyers which result in higher net returns. By combining vertical and horizontal co-ordination, co-operatives play an important role in connecting farmers to high quality market chains; in the process overcoming barriers to market participation, such as a high level of transaction costs experienced by smallholder farmers. However, they discovered that this role is mainly dependent on organizational efficient information and efficient decision making.

3.8.4 Co-operative Constraints.

A paper by Rajendran and Mohanty (2004) identified possible constraints that hinder dairy co-operatives' effective performance and development. The constraints identified were a lack of adequate financing for co-operatives because of a low asset base; a low education level of co-operatives members and illiteracy rate that inhibits adoption of new technologies; and the inability of co-operatives to solve problems that farmers face, such as a lack of providing inputs and marketing the farmer produce, because of co-operatives' low asset base and limited resources. In addition, farmer members do not attend meetings because of their negative attitude towards the co-operative, and development policies and laws as well as programs inhibit the emergence of proper leadership and skilled management. The study recommended that governments should provide a suitable environment and conditions for the development and growth of co-operatives as well as organizing specialized training courses for staff and board members. Moreover, Mohamed (2004) discovered that the major constraints of co-operatives involve a lack of finance, lack of trust that results in poor quality of services provided, lack of professional management, misappropriation of funds, low commitment and participation by members, lack of timely market information and a high price of agricultural inputs. However, a lack of finance was found to be the major constraint that inhibits co-operatives in achieving their functions and activities effectively and prevents farmers' needs being met.

The study recommended that smaller village co-operatives should be integrated to form larger co-operatives with greater economic entities which can provide and mobilize required resources to enable them to play their role effectively in agricultural development.

3.9 REVIEW OF TRANSACTION COSTS IN DAIRY MARKETING AND PRODUCTION.

In developing countries, smallholder farmers find it difficult to participate in markets and a large proportion of these farmers are still engaged in subsistence agriculture. This is because of poor infrastructure and a lack of market institutions (Dorward, *et al.*, 2005:3; World Bank, 2002:6) in the smallholder subsector, resulting in high transaction costs, coordination failure and market imperfections. Smallholder farmers are limited from increasing their production and market growth is retarded because of high transaction costs which make agricultural production and marketing expensive (Lapar, *et al.*, 2006:2; World Bank, 2002:8). As a result, farmers focus on subsistence production because in the absence of mechanisms to cope with these constraints, smallholders are less likely to participate in markets. These challenges are an indication of why agricultural growth is slow, particularly in SSA. Transaction costs affect smallholder agriculture that has the potential to improve agricultural production in Africa. They feature prominently in the agricultural sector and result in a lack of access to assets, production technology, information, input supplies and lucrative markets, which inhibit production by smallholder farmers (Lapar, *et al.*, 2006:4). In order to improve productivity and market access for smallholder farmers, transaction costs have to be minimized; and this does not require a single innovation or intervention but a variety of institutional arrangements. Extensive research that has been conducted recognizes farmer-led organizations, co-operatives and contract farming as instruments that can help reduce transaction costs and enhance market participation as well as bring about agricultural transformation in developing countries (BIRTHAL, *et al.*, 2005:2). This is made possible through horizontal

and vertical co-ordination of production, marketing and processing activities in markets. The purpose of this chapter therefore is to present a review of the influence of transaction costs on agricultural production, as well as on dairy production and marketing. Transaction costs in co-operatives as an institutional mechanism for an organization are also considered.

3.9.1 Defining Transaction Costs.

The issue of transaction costs has always been a major concern in agricultural markets. The term transaction cost is broadly interpreted as costs associated with market exchange. However, it is defined by Williamson (1996), cited in Pingali, Khwaja & Meijer (2005:9-10); Abdulai & Birachi (2008:106) as a “trade-off between the costs of co-ordination within an organisation and the costs of transacting and forming contracts in the market”. This trade-off depends on the degree of the transaction costs. On the other hand, Eggertson (1990:15) defines transaction costs as “the costs that arise when individuals exchange ownership rights for economic assets and enforce their exclusive rights”. In addition, Hobbs (1997:1083) classified transaction costs into information, negotiation, monitoring and enforcement costs. Information costs arise before an exchange and comprise the costs of obtaining price and product information as well as the cost of identifying an appropriate buyer. Negotiation costs are related to the costs of physically carrying out a transaction and comprise the commission costs, costs of negotiating the terms of an exchange and the costs of formally drawing up contracts. Monitoring and enforcement costs are the costs of ensuring that the terms of the transaction are adhered to by the parties involved in the transaction and occur after a transaction has taken place. Staal et al. (1997:782) categorised transaction costs into observable and unobservable costs, and this has been a widely-used definition because of its simplicity. This definition also builds on work done by Coase and incorporates a number of definitions that other authors have come up with. Observable costs are tangible and visible when an economic exchange takes place. According to these authors, observable costs include the costs of transport,

handling, packaging, storage, spoilage (variable transaction costs). Unobservable costs (fixed transaction costs), on the other hand, include the costs of information search, bargaining and enforcement of contracts. Because of the presence of transaction costs associated with information, negotiation, monitoring, coordination, and enforcement of contracts, it has been contemplated that intermediary firms will surface to economize on these costs.

3.9.2 Sources Of Transaction Costs.

Transaction costs originate from a number of sources; however, a major element of transaction costs relates to market information. Lapar et al.(2006:4) confirm that the availability of market information is limited, especially in developing countries, and this negatively influences market participation by smallholder farmers. Smallholder farmers lack reliable market information as well as information on potential exchange partners. Farmers without access to market information are unable to exchange their products in markets because conducting transactions tend to be costly for them. Information about prices, products, as well as buyers that farmers can exchange products with will enable their greater participation. Prior to marketing their product or choosing a buyer, farmers need to determine the price of their product which in turn affects their buying and selling decisions (Birthal, et al., 2005:10). These decisions are made based on the difference between the market price and the actual cost of production, yet information on market price can be costly and difficult to obtain. This results in a lack of access to information as farmers have to search for information to be in a better position to sell their product. Basically, transaction costs affect the output price which in turn affects traded output in markets (Somda, et al., 2005:190). In other words, transaction costs influence the production and marketing behaviour of farmers in markets in the sense that farmers will not participate in markets when the costs of undertaking a transaction exceeds the value of participating in the market. High transaction costs result in low prices experienced by farmers which discourage them from selling their produce. Transport and communication costs are also the most

important source of transaction costs among smallholder farmers (Makhura, 2001:40). High transportation and communication costs limit access to markets by farmers because of poor infrastructure. The majority of small-scale farmers are located in remote areas that are far away from service providers and the main consumers of their produce. The long distances arising from factors such as poor roads that farmers use to get to markets, lead to high transportation costs. Poor communication infrastructure, such as telephone service, limits farmers from accessing market information and results in high transaction costs particularly search and monitoring costs. Again, the nature of a product determines the prevalence of transaction costs, rendering variation in production and marketing (Pingali, et al., 2005:66). Smallholder farmers in the agricultural sector face high transaction costs in the marketing of their products. However, farmers of perishable products incur higher transaction costs than farmers of any other agricultural products. Perishable products require rapid transportation to avoid losses arising from spoilages. This results in high transportation costs and limits the marketing options available to small and remote farmers. Furthermore, transaction costs arise when an asset-specific investment has been made (Van Der Hallen, 2009:6). This means that the investment in that asset is to some extent non recoverable when the need to divert resources arises, resulting in opportunistic behaviour from buyers transacting with the owner of the asset. Opportunism is a fundamental concept in the study of transaction costs. It results in transaction costs which cannot be directly observed. Opportunism specifies that individuals are guided by self-interest and behave in a manner deceiving to the other party during the exchange process (Williamson cited in Makhura, 2001:27). This gives rise to transaction costs in the form of monitoring and ensuring that the other party does not engage in opportunistic behaviour. Moreover, transaction costs occur due to the fact that farmers have to search for buyers, determine the terms of contracts, and then conduct the negotiations leading to a bargain. There is also a need to draw up contracts and ensure that the terms of the contract are adhered to (Hobbs, 1997:1088). All these procedures are sufficiently costly to smallholder farmers and

prevent many transactions from taking place. Household characteristics are also a source of transaction costs. Age, gender and education have an effect on transaction costs in different ways. They influence the cost of information search, negotiation, monitoring and enforcement. Age can signify farming experience. This implies that a higher level of experience makes certain information and search costs cheaper to obtain. On another note, education facilitates minimization of costs associated with searching for information, for example a higher education level reduces cost of searching for information as well as the time taken to process and act on that information (Pingali, et al., 2005:66-67). For farmers to actively engage in markets, they need to search for buyers, determine the terms of a transaction, and conduct negotiations resulting in bargaining and drawing up of contracts. Again, farmers also need to ensure that the terms of contracts are adhered to. These are costly activities that prevent a number of transactions from taking place. Therefore, there is a need to have institutions in place that will help minimize the high costs of conducting transactions in order to improve market participation by smallholder farmers. Institutional innovations such as co-operatives have been suggested as potential vehicles that can link farmers to markets by reducing transaction costs; which will be addressed in the next section on co-operatives and transaction costs.

3.9.3 Sources of transaction costs in dairy production.

As a perishable product and prone to post harvest losses, milk has to be quickly transported to consumption centers or processed within a couple of hours after production into less perishable forms. It can be stored for two to three days before processing only when kept at a low temperature. However, in most cases, farmers do not possess post harvest infrastructure or chilling facilities to keep milk in a good condition and this implies greater losses to them. In addition, milk requires rapid transportation to consumption places or to processing centers (Holloway, et al., 1999:6; Staal, et al., 1997:782). Accessible markets are usually distant from places of production, which limits marketing options available to

smallholder farmers and increases transportation costs. Because of the high transportation costs which make it expensive for farmers to transport their milk; farmers resort to selling their produce at the farm gate or other market outlets with lower transaction costs but also lower prices. These market outlets offer lower prices for farmers' produce hence low returns. Moreover, the bulky nature of milk contributes to high transportation costs incurred by farmers. In general, raw milk is more than 80 % water, resulting in high transportation costs per unit. Consequently, the quantity that can be sold at a time is limited, especially for farmers without vehicles to transport milk (Holloway, et al., 1999:7). High transportation costs therefore limit farmers from selling their produce in remunerative markets. Furthermore, dairy production is a year-round activity and requires a guaranteed market that has to be maintained. This means that the frequency of transactions is high (Ngigi, Delgado, Staal & Mbogoh, 2000:3; Staal, et al., 1997:783) and producers have to search for stable buyers or outlets for their product which results in high transaction costs. Again, because of its perishability as well as natural variation, the composition and quality of milk vary and are difficult to determine. Monitoring costs therefore arise because milk quality has to be monitored and controlled, hence resulting in high transaction costs. Similarly, the nature of milk can result in opportunistic behaviour on the part of market agents purchasing milk from farmers. As argued by Abdulai and Birachi (2008:106), buyers of milk may take advantage of the lack of simple measurable quality standards by rejecting milk when they have already made an agreement with farmers to buy certain amounts of milk higher than what they can profitably sell. This also contributes to high transaction costs in the smallholder dairy sector. When farmers sell directly to consumers through direct transactions, they are able to retain much of the price paid by consumers. However, the costs of searching for buyers and the delivery of milk can be very high, leading to a lot of uncertainties involved in milk marketing. Moreover, dairy production is asset specific, which also contributes to high transaction costs in dairy farming. For instance, farmers in dairy production have to invest in assets such as a milking parlour,

dairy cattle, processing equipment and milk coolers, which are specific to dairy production and would not be easily transferred to other enterprises. Thus these result in transaction costs, particularly in the presence of opportunistic behaviour or unsecure market outlets. The uncertainty principle states that the greater the uncertainty surrounding a transaction, the less likely a transaction is to be efficiently mediated by independent market contracting (Statz, 1987:94). Dairy production is a risky venture and is surrounded by a lot of uncertainties emanating from price, nature of milk and behaviour of buyers. When uncertainty increases, farmers have to move from spot markets to contracts which increase the costs of negotiating for these contracts. Co-operatives therefore offer more ways of dealing with uncertainties through horizontal and vertical integration in markets by farmers.

3.9.4 Can Co-operatives Reduce Transaction Costs In Dairy Production And Marketing?

If transaction costs in dairy production and marketing are as high as described above, the question then is: how can co-operatives help in reducing these transaction costs? In the first instance, co-operatives enhance milk production and productivity, which is made possible by having more reliable access to production inputs, capital, technology and information (Lapar, et al., 2006:14). As far as rural households are concerned, developing a greater surplus of milk for marketing is not simply a question of improving production technologies or increasing milk prices in order to increase supplies; there are other factors governing the post-production decision at the farm level which co-operatives have the potential to contribute to. Through co-operatives, farmers are provided with a guaranteed market that is otherwise not possible on a regular basis for milk producers. In so doing, farmers' transaction costs are absorbed (Sinja, et al., 2006:3) that would otherwise hinder small farmers from market integration. They reduce milk marketing costs of raw milk, such as the information costs, costs of searching for markets and drawing up contracts, negotiating costs as well as monitoring and enforcement costs. To individuals these markets are closed but are opened to members of a producer organization. Linking farmers to markets has a positive

effect in improving their competence and viability through horizontal integration. Subsequently, milk produced and sold by farmers increases which implies higher incomes in the smallholder sector. Again, dairy production is a risky business characterized by a lot of uncertainties arising from the nature of milk and price fluctuations. Greater access to markets through co-operatives improves farmers' capacity to withstand risks that arise from production and price fluctuations. Co-operatives enable farmers to share these risks and result in a reduction of transaction costs which make co-operative members better off compared to independent producers (BIRTHAL, et al., 2005:2). Through co-operatives, the variability of farmers' income is reduced because of a reliable market that offers a regular income to farmers. Therefore, any fluctuations in prices are offset by the regular income and the fact that co-operatives buy milk from farmers at fixed prices. As producers of a perishable product, dairy farmers are required to ensure milk is of good quality by adhering to safety standards. In reality, smallholder farmers are unable to meet these stringent food safety and quality control requirements indicated by their inefficiency to provide standardized products on a continuous basis as demanded by buyers (Valeeva, 2005:60). This can be attributed to a lack of information and quality control measures which are very costly for smallholder milk farmers considering that buyers at times do not pay the highest price for the highest quality product. Subsequently, farmers are not motivated to invest in ensuring quality due to lower market revenues. Co-operatives therefore enable the assurance of milk quality through the provision of chilling facilities as well as value addition, which can establish a collective reputation for quality that generates better output prices which may not otherwise be possible under individual farmer conditions. In addition, co-operatives compensate for the problem of required big investments in marketing infrastructure and services, given that the fixed costs of such investments can be shared between group members (Lapar, et al., 2006:6). Because of its perishability, milk needs to be processed within two to three days if not sold immediately after production. Farmers on their own cannot afford to buy post harvest equipment, such as milk coolers

and processing equipment. Co-operatives therefore overcome smallholder farmers' barriers to assets by collectively sharing the cost of these investments; especially to improve product quality and enable value addition, in the process improving the amount of milk sold by farmers. Access to market information is one of the major problems farmers are faced with (Lapar, et al., 2006:6). Incomplete and asymmetric information gives room for opportunistic behaviour among market agents buying milk from farmers. As a result, mutually advantageous transactions may fail to occur. Co-operatives reduce the need to search for reliable and current price information. However, member farmers still have to follow the market evolution to ensure that prices offered by the co-operatives are fair. Co-operatives therefore lower transaction costs for farmers by obtaining, interpreting and disseminating information about production and markets. Due to the fact that farmers do not have to actively search for current and reliable market information, they incur lower information costs in comparison to farmers in normal dairy chains (Cordes, Richerson, McElreath & Strimling, 2006:12). Farmers in co-operatives do not have to negotiate with potential buyers or input providers for a transaction to take place. This is because co-operatives can provide market power to their members through collective negotiations with suppliers or buyers of milk, by controlling member supply into the market (Valentinov, 2007:58). A co-operative can negotiate for better prices paid by buyers and better terms for the purchase of inputs by their members, which reduces production costs. Lower production costs imply more milk produced and sold because of lower negotiation costs, which simultaneously lower transaction costs. Farmers only have to reach an agreement with the co-operative on quality and price of milk so long as the price received by farmers is fair. In cases where dairy farmers are highly dependent on local milk traders and processors for carrying out regular and timely purchases of produced milk, farmers receive less income than when they sell directly to individuals. This dependence creates the possibility for these market agents to opportunistically seize farmers' profits (Sinja, et al., 2006:3). Dairy co-operatives therefore help farmers to avoid such a situation by allowing them to sell

their milk directly to the co-operative as well as by internalizing milk processing which results in higher profits for the farmers. Co-operative members do not have to search for potential buyers willing to pay a good price for their produce since they have a guaranteed market available to them in the form of a co-operative. In the process, farmers incur lower search costs that in turn result in lower transaction costs. Lastly, as a result of milk perishability and its bulky nature requiring rapid transportation, dairy farmers incur high transportation costs, which can also be attributed to poor road infrastructure. Poor road infrastructure increases transportation time and costs associated with accessing markets and information. Co-operatives therefore minimize transportation and communication costs through the collective transportation of milk to the market as well as the improvement in infrastructure (Pingali, et al., 2005:21). Although co-operatives have the potential to reduce transaction costs for smallholder farmers, they are also susceptible to transaction costs by way of the design of the organization itself and the influence of human behavior. Hence, the next section discusses transaction costs problems associated with co-operatives and their institutional design.

3.10 UNPACKING INSTITUTIONAL ISSUES WITHIN CO-OPERATIVES.

Co-operatives as a way of horizontal co-ordination are perceived to be a vehicle for the minimization of transaction costs and improvement of access to more reliable markets by smallholder farmers. However, they can also introduce costs and institutional problems which can have a negative effect on the participation of smallholder farmers in group arrangements and in turn negatively affect the overall performance of the group (Gadzikwa, Lyne & Hendriks, 2007:130). Cook (1995:1156) identified five problems that result in transaction costs in co-operatives, which are discussed as follows:

3.10.1 Free riding.

Free riding is one of the major problems that results in transaction costs among co-operatives. According to Cook (1995: 1156), free riding arises when members or non members utilize a resource for their own

benefit. Open membership co-operatives are particularly subjected to free riding because non members cannot be excluded from negotiated terms of trade benefits even if they refuse to join the co-operative. Cook further states that free riding is exhibited when gains from a co-operative can be accessed by individuals who did not fully invest in the development of those gains. New members obtain the same support, residual rights and benefits as existing members (Gripsrud, Lenvik & Olsen, 2000:3). This discourages existing members from investing in the co-operative. Trust is one way of dealing with free riding in co-operatives in the sense that it discourages free riding by increasing the individual benefits of collective action, and hence less free riding is exhibited.

3.10.2 Influence Costs.

Influence costs result from activities in which members or groups in an organization attempt to influence decisions that affect wealth distribution and other benefits (Royer, 1999:56). A co-operative that is involved in a wide range of activities and has members with diverse interests experiences high influence costs because the different groups will want to influence decisions made in the organization. The extent of influence costs depends on the existence of a central authority that can influence the distribution of costs and benefits to members, the measures of decision making as well as the degree of homogeneity among members (Cook, 1995:1157).

3.10.3 Horizon problem:

The horizon problem arises “when a member’s residual claim on the net income generated by an asset is shorter than the productive life of that asset” (Cook, 1995:1157). In this case, members are likely to under invest in assets because the return received is less than the return generated by assets hence the benefits from an investment are limited to the time period over which members expect to be patrons of the co-operative. Subsequently, co-operatives tend to under invest in assets with long-term returns such as research and development or, in the case of dairy co-operatives, chilling equipment and tanks. This

implies that co-operative members prefer current cash flow compared to investments, hence the horizon problem.

3.10.4 Portfolio problem .

The portfolio problem occurs in conventional co-operatives because members invest on a proportional basis according to their use of a co-operative and because equity shares in the co-operative cannot be freely traded (Cook, 1995:1157). Members are therefore not in a better position to diversify their individual investment portfolios according to their risk preferences (Royer, 1999:55). As a result, risk averse co-operative members will exert influence on co-operative management to restructure the co-operatives investment portfolios to a reduced risk portfolio, even if this implies lower expected returns. Because potential investors who can diversify the risks of lower expected returns are excluded from investing in the co-operative, members have to bear these risks in an individual capacity.

3.10.5 Control problem

A control problem is caused when divergence of interests between co-operative members and representative board members (principal) and the management (agent) is being prevented (Cook, 1995:1157). A control problem occurs when ownership and control in a co-operative are separate and, according to Royer (1999:55), this can be a problem in the sense that shares in conventional co-operatives cannot be easily exchanged because of absence of equity markets and lack of equity-based management enticement schemes available to other firms. An absence of these markets implies that members are unable to monitor a co-operatives worth or assess management's performance. Lack of equity incentive mechanisms for managers puts co-operatives at a disadvantageous position because they cannot attract or retain competent managers. Iliopoulos and Cook (1999: 80) argue that although the control problem exists in majority of organizations, it is likely to be less severe in co-operatives of small sizes that have a single purpose and their members have the same interests as compared to big co-operatives.

The above-mentioned problems emanate from ill-defined property rights which result in institutional problems increasing transaction costs in the management and control of co-operatives and thereby reducing their effectiveness. In essence, these institutional problems retard growth and performance of co-operatives; and hence they have to be minimized by strengthening assignments of property rights to individual members. Among these problems, only free riding and horizon problems can be associated with co-operatives.

In most cases, co-operative members as well as non members utilize co-operative resources to fulfil their own interests. This is due to that property rights are not well defined to guarantee that members or non-members bear the full costs of their actions or receive the full benefits from co-operative participation. Members do not participate in co-operative activities and decisions and yet want to benefit from the co-operative. They do not attend meetings, do not contribute to capital accumulation and sell part of their produce to other marketing outlets. This is an indication of a lack of commitment on the part of co-operative members.

3.11 SUMMARY

The participation of smallholder farmers in markets in developing countries remains low because of a prevalence of high transaction costs, which a number of studies have termed a key reason for smallholder farmers' failure to participate in markets. From the literature reviewed, co-operatives represent initiatives that can address this constraint by reducing transaction costs that form barriers for market participation. Dairy production is characterized by high transaction costs and from the above discussion, it is evident that co-operatives have the potential to significantly reduce transaction costs among smallholder dairy farmers. A reduction in transaction costs will improve milk marketing and contribute to smallholder dairy development. Although co-operatives represent an integrated arrangement aimed at reducing marketing

costs, they are also affected by transaction costs, such as opportunism and free riding. Therefore, for co-operatives to be effective developmental instruments, these problems have to be minimized.

CHAPTER FOUR: RESULT AND DISCUSION

4.1 INTRODUCTION

This chapter presents findings of the study. It presents the descriptive analysis of the role played by co-operatives in dairy production and marketing of smallholder farmers in the study area. Characteristics of both co-operative and non co-operative farmers, their production systems, marketing systems as well as their performance indicators are presented and discussed in detail. All of these were used in the assessment of the role cooperatives in dairy production. This chapter also presents the benefits of being a co-operative member as well as the constraints experienced in dairy co-operatives which inhibit co-operative development.

4.2 SOCIO-ECONOMIC CHARACTERISTICS OF SAMPLED DAIRY FARMS

4.2.1 Age, gender and education level of household head

The age of the household head is very important when it comes to decision making. Older farmers are deemed more experienced than younger farmers, and younger farmers are known to be risk takers. According to Table 4.1, the average age was higher (50 years) in the case of independent farmers compared to co-operative member farmers (47.4 years). However, age did not vary significantly between co-operatives and independent farmers. The sample t test indicates that the difference in mean average age between co-operative and non co-operative farmers is statistically significant at a 10% level of significance. This indicates that co-operative farmers are slightly younger than independent farmers and this finding concurs with a number of studies conducted.

Table 4.1: Age of household heads.

Age Range	Non co-operative members n = 45		Co-operative members n = 45		t value
	Frequency	%	Frequency	%	
<30	0.0	0	5.3	11.7	
30-40	7.5	16.7	15.0	33.3	
41-50	16.5	36.7	9.0	20	
51-60	12.0	26.6	9.8	21.7	
>60	9.0	20	6.0	13.3	
Average age	50.0		47.4		1.36*

Source: survey data, 2014

***Significant at 1%, **Significant at 5%, *Significant at 10%

Table 4.2 indicates that out of the 90 households interviewed, 66.7% were male headed and 33.3% of the households were female headed. However, there is a higher percentage (43.3%) of female-headed households among co-operative members as compared to non co-operative members (23.3%). This may be attributed to the fact that co-operatives encourage the participation of females who are generally excluded from more rewarding agricultural opportunities because of a lack of resources, especially land. In addition, the education level attained by the household head is of importance, given that it plays a vital role in the adoption of new technologies that will have a positive influence in dairy farm management. Results indicate that a majority of farmers interviewed are mainly literate; however, co-op members have a higher literacy rate (82%) than independent farmers (73%). On average, they have 9.8 years of schooling while non co-op members have 8.9 years of schooling, as shown by Table 4.2. This implies that relatively educated farmers participate in co-operatives. The t-test indicates that there is no significant difference in the education level between co-operative member farmers and independent farmers.

Table 4.2: Gender and education level of household heads

	Non cooperative members n=45		Cooperative members n=45		T value
	Frequency	%	Frequency	%	
Male	36	80	29	64.4	1.11
Female	9	20	16	35.6	
Educational level					
Non formal education	12	26.67	7	15.6	
Primary education	18	40	9	20.0	
Secondary education	7	15.56	14	31.1	
Tertiary education	8	17.78	15	33.3	

Source: Survey data, 2014

***Significant at 1%, **significant at 5%, *significant at 10%

4.2.2 Household Size

The household size is an indication of the available labour in the household. Dairy production is a labour intensive activity; therefore, a large family size is an indication of the availability of more labour. In the study areas, a household consisted of 9 members on average, as indicated by Table 4.3. However, the household size for co-operative members was 9.5 while that of independent farmers was 8.7. The t-test indicates that the mean difference between co-operative members and non co-operative members with respect to household size is statistically significant, at a 5% level of significance. A potential explanation for this is that households with a larger household size have more labour available for dairy production, hence more milk will be produced which will require a market that will absorb all milk produced.

Table 4.3: Household Composition

	Non cooperative members		Cooperative members		T value
	Number	%	Number	%	
Adult members	3.7	43	4.2	45	
Children	4.9	57	5.2	55	
Average house hold size	8.6		9.4		2.26***

Source: survey data, 2014

***Significant at 1%, **significant at 5%, *significant at 10%

4.2.3 Major sources of income

Households interviewed derived their livelihood from different activities apart from dairy production. The majority of households depended on agricultural activities as a source of income, indicating that farmers integrate milk production with other agricultural activities. The results confirm that approximately 60% of farmers interviewed depend on farming for their livelihood with more independent households depending on agriculture for their livelihoods. It is also estimated that 35% of co-operative members and 18.3% of independent farmers depend on off-farm employment as their major source of income, with dairy production being a secondary source. These households are expected to invest part of their earnings in the dairy enterprise to improve the farm operations as well as the asset base of the household, hence larger herd sizes.

Table 4.4: Major sources of income

source of income	Non cooperative members n= 45		Cooperative members n= 45		
	n	%	n	%	
Dairy	7	15.6	8	17.8	
Dairy and other agricultural income	24	53.3	15	33.3	
off farm employment	8	17.8	15	33.3	
other	6	13.3	7	15.6	

4.2.4 Household endowment

Land

Land is the most important asset as the majority of the respondents derived their livelihood from farm-based activities. It was found that 95% of the farmers interviewed have land owner certificate. From the results, it can be gathered that the average land size for farmers interviewed was 1.2 hectares which presents a serious challenge to dairy farmers. It was noted that 55% of dairy producers interviewed indicated land size as one of their major constraints for expanding dairy farming activities. This limits feed resources as well as production of improved animal feeds, thus requiring farmers to intensify their production systems by practicing zero grazing, which is costly for smallholder farmers.

Asset ownership

Table 4.5 shows the asset ownership of farmers interviewed. In general, livestock keeping is still considered a source of social status, hence the majority of households interviewed own livestock. As shown in Table 4.5, 61.7% and 68.3% of non co-operative and co-operative farmers respectively owned

livestock which comprised of cattle, sheep, goats and chickens. In addition, results indicate that farmers own a number of assets, such as cart (horse or donkey drawn), dairy parlour, and cooling facilities, which is illustrated in Table 4.5. Asset ownership for both co-operative and independent farmers is not significantly different. However, results suggest that more of co-operative members own presented assets compared to non co-operative members.

Assets, such as milking equipment and cooling facilities, are important inputs in milk production. Milk has to be kept in good quality until it is sold. However, as indicated above, only a small percentage of both farmers had chilling facilities to keep their milk fresh, accordingly resulting in farmers incurring high losses due to spoilage. In the case of farmers interviewed, a dairy parlour is a simple structure or shed whereby a maximum of three cows can be milked at a time. For some farmers, the milking parlour serves as a storeroom for feed especially concentrates used for feeding cows during milking.

Table 4.5: Asset ownership

Variable	Non co-operative members n=45		Co-operative members n = 45	
	N	%	N	%
Livestock ownership	27.0	60.0	30.0	66.7
Other :				0.0
Horse or donkey drawn cart	10.0	22.2	13.0	28.9
Dairy parlour	37.0	82.2	40.0	88.9
Chilling facilities :		0.0		0.0
Refrigerator	3.0	6.7	5.0	11.1
Cooler tank	0.0	0.0	0.0	0.0

Source: Survey data, 2014

4.3 DAIRY PRODUCTION SYSTEMS

It is important to understand the milk production systems and patterns within which milk production occurs. Milk production is mainly divided into the traditional and commercial sectors (IFAD, 2001:23). However, there are also farms that employ both production systems. Production systems of co-operative and non co-operative farmers were not significantly different from each other. It was found that 4% of farmers interviewed were using the traditional system of production whereby dairy cows are kept mainly for consumption, and excess milk was sold to the neighbors to increase household income. The sale of milk was not their main objective; although they did sell surplus milk when the need arose. Hence, households were not market oriented. On another note, the majority of farmers (86%) interviewed used a production system that is an intermediate between the traditional and commercial production systems. Farmers integrated dairy production with other activities, owned both dairy breeds as well as the local, relied more on family labour, and the main source of feed was grazing or purchased hay and concentrates. Their main objective was to get additional income generation from the sale of milk; hence these farmers are termed market oriented. Only 10% of the whole sample exhibited characteristics of the commercial production system. These farmers kept dairy cattle solely for profit generation through milk sales and the sale of animals. They sold most of their milk produced and there was no integration of dairy production with other enterprises. Farmers only used high producing dairy breeds for production purposes and relatively a more improved technology was used on the farms.

4.3.1 Variable Inputs Employed

The purpose of this section is to indicate whether there are any differences in expenses incurred during procurement of inputs between co-operative and non co-operative farmers. According to reviewed literature, one of the roles played by co-operatives is helping farmers in procuring inputs at cheaper prices

because of the collective purchasing of inputs. Hence this section reveals whether co-operative farmers spend less on inputs than non co-operative farmers.

Non - labour inputs

Table 4.6 presents the monetary values of variable inputs that were used for both co-operative and non co-operative dairy enterprises. For the estimation of variable inputs, information of different inputs and prices was obtained from farmers and quantities used were multiplied by their unit prices to derive the cost of inputs. Cost of input/farmer was then divided by the herd size/farm to get average cost per cow. As indicated in Table 4.6, the highly employed inputs for both co-operative and independent farmers are feed, transport and labour. They account for 38%, 20.6% and 27.1% of the total inputs respectively in co-operative farmers; whereas for independent farmers, these inputs account for 35.6%, 30% and 17.2% of total inputs respectively. Feed is the most important factor in dairy production because for dairy animals to be more productive, they need sufficient and good quality feed. The high cost of feed is attributed to the majority of farmers' reliance on expensive purchased feed due to the scarcity of feed. Feed expenses for co-operative members are slightly higher because 75% of co-operative members relied more on purchased feed compared to 60% of independent farmers. This implies that the training received by co-operative members on feed, fodder production and conservation was not effective in motivating farmers to produce their own feed material. The high cost of transport for independent farmers is because farmers have to travel long distances (8.1 km) to sell their milk compared to 4.5 km travelled by co-operative members. In addition, input providers are situated far from where farmers are located, particularly rural farmers, hence high transportation costs. The variations among inputs are accounted for by the different herd sizes that farmers own resulting in the employment of inputs at different rates.

Labour inputs

Like most smallholder farming systems, the use of family members as a source of labour is a common tradition. The results of the survey indicate that family labour is the major source of labour in the studied areas. In this regard, 61.7% of co-operative participants relied on family labour and 38.3% relied on hired labour for routine farm activities. In comparison, 78% of non-co-operative farmers relied on family labour and 22% relied on hired labour for routine farm activities. Co-operative farmers therefore are spending more on labour because a higher percentage relies on hired labour. This is due to the fact that the majority of co-operative members have off-farm jobs and hence spend less time on the farm and spend more on labour. Consequently, hired labour is required for daily farm activities. However, hired labour is costly for smallholder farmers because it results in higher costs of production, hence the high reliance on family labour.

Table 4.6: Variable Inputs used per month

	Non Co-operative members		Co-operative members		
	cost /cow	% of total inputs	cost /cow	% of total inputs	
Feed	252.4	37.5	191.1	41.0	
Dipping	69.3	10.3	41.9	9.0	
Drug and Vet.	57.2	8.5	37.3	8.0	
Transport	191.8	28.5	79.2	17.0	
Labour	102.3	15.2	116.5	25.0	
Total	673.0	100.0	466.0	100.0	

Source: Survey data ,2014

4.3.2 Herd size, Milk production and reproductive performance of cows.

Herd size and composition

Table 4.7 indicates that, on average, independent farmers and co-operative members had 4.4 and 5 dairy animals respectively. This suggests co-operative members have a slightly bigger herd size which can be attributed to an improvement in access to dairy breeds through co-operatives. However, this difference is not significant according to the independent t test, suggesting that it can be safely argued that herd sizes are very similar across the two groups. Furthermore, herd composition by breed does not differ significantly between co-operative and non co-operative members. Breeds mainly used by farmers are the Jersey and Friesian pure breeds, their crosses as well as the local. Farmers use more specialized breeds than indigenous breeds. Exotic breeds accounted for 73% and 70% of the total dairy herd for co-operative and non co-operative members respectively, whereas the local breed accounted for 15% and 20% for co-operative and non co-operative farmers respectively. The dominant breed is the Jersey breed for both co-operative and non co-operative members because of its high quality milk (high fat content) and hence low feed consumption. Friesian cows are known for high milk production; however, the milk is of poor quality, with a low butter fat content. The high percentage in ownership of dairy breeds could be accounted for by the fact that the agricultural sector encourages farmers through extension workers to use pure breeds for their production activities and the dairy cooperative union assists farmers in procuring them from research centers and other appropriate sources

Table 4.7 Heard size and composition

Variable	Non co-operative members n=45		Co-operative members n = 45		t value
	N	%	N	%	
Jersey	22	48.9	25	55.6	
Friesian	9	20.0	7	15.6	
Crosses	4	8.9	7	15.6	
Local	10	22.2	6	13.3	
Heard size	5.4 (2.81)		6.1(2.97)		1.36

Source: Survey data, 2014

Milk production and reproductive performance of cows

Table 4.8 indicates that co-operative and independent farmers were milking 3.5 and 3.4 cows respectively during the study period. This accounts for 57% and 62% of the total herd for co-operative and non co-operative farmers respectively. The survey results indicate that the average lactation period for co-operative members was reported to be higher than the average lactation period for non co-operative member cows. Average lactation is significantly lower than 290- 300 days for dairy breeds and this negatively affects milk production. Average milk production was found to be 928 and 1 151 litres per month for non co-operative and co-operative members respectively, and it was found to be statistically significant at a 5% level of significance. Milk productivity per cow per day was 9.5 litres and 11.1 litres for non co-operative and co-operative members respectively suggesting that co-operative members enjoy a 14.4% higher productivity above the independent farmers. High milk production may be attributed to improved management practices that have resulted from training and extension services, hence higher milk productivity. The mean difference between co-operative and non co-operative farmers was found to

be statistically significant at a 5% level of significance. This implies that co-operative farmers produce higher quantities of milk compared to independent farmers. Overall, milk production per cow across all farmers is far less than the average 15-20 and 20-25 litres per day for Jersey and Friesian cows respectively. This implies that animals are not performing to their maximum expectations, which is mainly attributed to insufficient good quality feed. Farmers are experiencing feed shortages in summer and winter; however, feed shortage is severe in the dry season, thus farmers rely on purchased feed and concentrates. In addition, the high price of concentrates pushes farmers to reduce the volume of feed ratio, resulting in low productivity. Low milk productivity is a serious constraint among smallholder farmers and there is a need for improvement of productivity in order to boost the availability of milk in the country. Changing milk practice of milking twice a day to milking three times a day can help to stimulate milk secretion to the mammary glands and thereby increase milk production per day.

Table 4.8: Milk yield and lactation

	Non co-operative members	Co-operative members	t value
lactating cows	3.4	3.5	0.27
Lactating period (days)	250	270	
Average Milk yield (litre/day)	928	1151	2.27
Milk yield per cow (lites/day)	9.5	11	3.6

Source, survey data 2024

4.3.3 Husbandry and management practices.

Breeding systems and disease control practices

Based on the results presented in Table 4.9, it is evident that a higher percentage of co-operative farmers employ artificial insemination (AI) compared to the use of bulls for breeding purposes. This is because farmers are trained to use the AI method for improvement of the dairy herd although this method is expensive for smallholder farmers. The AI procedure sometimes has to be performed more than once and farmers are expected to pay for all sessions. In the case of a rented bull, farmers only pay once since the bull is either rented or owned by the farmer; hence this method is cheaper for most farmers. The survey found that farmers are generally not satisfied with AI and 60% using this service reported to have successful insemination after two to three trials, yet they were required to pay for every trial. In addition, farmers find the use of AI a disadvantage because only extension officers can carry out the procedure, yet they are situated far from where farmers are located, resulting in longer calving intervals. Nevertheless, the survey found that some farmers did prefer AI compared to having a bull, particularly for management efficiency, because having a bull means economizing feed resources that can be used for feeding cows.

Table 4.9: Breeding practices

Breeding System	Non cooperative members n = 45		Cooperative members n = 45	
	n	%	n	%
AI	22	48.9	29	64.5
Bull	14	31.1	11	24.4
AI and Bull	9	20	5	11.1
Source: Survey data of 2014				

Livestock diseases cause economic losses in dairy farming and for this reason; dairy farmers are required to have a preventive or health program for their animals. This is highly recommended as an alternative to the treatment of sick animals. However, the results revealed that farmers did not have preventive programs and only treated animals when they were infected. The results indicated that 55% of co-operative members had preventive or vaccination programs compared to 30.8% of independent farmers. This is because although the provision of veterinary aid service was made by co-operatives, farmers are required to buy their own veterinary drugs. A veterinarian visits farmers once every week to examine animals and offer advice to farmers. Farmers pointed out that they find vaccination programs to be expensive compared to treatment of sick animals. This has contributed to the high mortality rates of animals among farmers. Feeding systems and management Animal feed is a major input in dairy farming and results on the types of feeding systems are given in Table 4.10. From the results it can be gathered that grazing (natural pasture) is the major source of feeding used by smallholder dairy farmers. It is comprised of communal grazing, private grazing and zero grazing (stall feeding). Only 35% of farmers had improved forages and pastures on their grazing land. The majority of these were co-operative members. Farmers are unable to produce their own feed because of inadequate land and water resources. Therefore, they rely on purchased feed which increases production costs of farmers and results show that 67.5% of farmers across the whole sample relied on purchased feed. Supplementary feeding with crop residues and legumes in study areas was also a common practice among sampled dairy farmers. To overcome the seasonal shortage of feed, some farmers have developed their own coping mechanisms of feed conservation in the form of storing and stacking hay as well as crop residues.

Table 4.10: Feeding systems

Feeding System	Non co-operative members (%) n = 45	Co-operative members (%) n = 45
Communal grazing only	5	0
Private grazing only	36	55
Zero Grazing only	3	10
Communal and private grazing	15	6
Private and Zero grazing	18	25
Communal, Private, and zero grazing	23	4

Source: Survey data, 2014

Milk handling

Milking utensils affect the quality of milk. The type of utensils used as well as the methods and frequency of cleaning milking utensils affect the quality of milk and its products. Plastic containers commonly used by farmers for the storage and transportation of milk are susceptible to microorganisms and bacteria, yet farmers continually use them. With regard to the type and quality of milking utensils, results of the survey reveal that 74.5% of co-operative members and 37.5% of independent farmers use aluminium cans for milk handling, storage and transportation. This indicates that co-operatives have been effective in encouraging farmers to use proper milk handling practices. The co-operatives took the initiative to supply farmers with aluminum buckets and cans to ensure that farmers supply good quality milk. The frequency and methods of cleaning and types of material were the same for both co-operative and non co-operative farmers. Milking utensils are cleaned with detergent and warm water after every use; although not all farmers put this into practice due to a lack of water.

Water sources

According to Lukuyu, Romney, Ouma and Sones (2007:7), a milking cow requires five litres of water to produce one litre of milk, making water essential in dairy production. Limiting water availability to dairy cows lowers milk production rapidly. The quality of water also have to be considered because poor water quality often contributes to low production as well as negatively affect health of dairy cows. This necessitates the availability of adequate good quality water for cows at all times. The survey results indicate that streams and rivers were the major sources of water supply used by dairy farmers, as shown in Table 4.11. This Represents Substantial Energy loss for dairy cows in terms of travel time involved to and from the water source, which negatively contributes to productivity. In addition, this implies that water quality is a bit of a problem for farmers which might partly explain poor performance of dairy cows. From the results presented, it is evident that co-operatives are making an improvement to water availability and quality by ensuring that farmers have access to piped water as well as boreholes. However their progress is constraint by their limited financial capacity hence not all cooperative farmers have access to very clean water.

Table 4.11: Sources of water supply

	Non co-operative members (%) n = 45	Co-operative members (%) n = 45
Water source		
River and streams	63	45
Piped water	19	30
Boreholes	18	25

Source: Survey data, 2014

Record keeping

Record keeping is a vital tool that enables farmers to make sound decisions, control production and reproductive performance of dairy cattle as well as help determine profit made. Approximately 65% and 45% of co-operative and independent milk producers respectively practised record keeping, as indicated by Table 4.12. However; only milk production marketing and breeding records were mostly available for a majority of farmers, especially independent farmers. Records on inputs used and other essential records were not available, which implied reliance on estimation. The culture of record keeping by co-operative members is attributed to training received from co-operatives on the importance of record keeping. Overall, smallholder farmers do not keep records, making it difficult for them to control their activities.

Table 4.12: Record keeping

	Non co-operative members (%) n = 45	Co-operative members (%) n = 45
Keep Records		
Yes	45	65
No	55	35

Source: Survey data, 2014

4.3.4 Milk Marketed and Consumed

The amount of milk marketed and consumed per week per household by co-operative and independent farmers is given in Table 4.13. There was a statistical significant in the difference between co-operative and non-co-operative members in milk consumed and sold. Co-operative members sold significantly higher quantities of milk than non co-operative members. This can be attributed to a higher milk production through better access to improved veterinary services, training received, improved husbandry practices as well as a reliable market provided by the co-operatives. Out of the total milk produced, co-

operative member farmers sold approximately 85%, whereas independent farmers sold 74.5%. This indicates a low home consumption level and a low level of milk losses from milk spoilages among co-operative farmers. The higher share of milk sold to the market by co-operative farmers is an indication that co-operatives have played a positive role in the increase of milk marketed by smallholder farmers compared to independent farmers. The low percentage of milk sold out of total production amongst independent farmers could be attributed to high home consumption and losses from spoilages. The highest price received by producers was 8 birr/Litre and these were independent farmers, while 6 birr/Litre was the lowest price paid to co-operative members. Overall, the average price per litre of milk was higher for independent farmers (8.50 birr) than for co-operative members (7.20 birr). This implies that co-operative farmers only benefit from a guaranteed market and fixed milk prices hence they are not susceptible to price risks while independent farmers benefit from high prices, although these are highly volatile. In this case, co-operatives have only eliminated the price fluctuation risk factor but not improve the actual price paid to farmers. Co-operatives determine the price that farmers use to sell their milk whereas independent farmers have the privilege of setting their own prices. This has contributed to independent farmer prices for milk being higher than co-operative farmer prices. Due to the fact that cooperative farmers sell at fixed prices while non co-operative sell at fluctuating prices throughout the year, a weighted average price received by non co-cooperative farmers is usually considered. This is calculated as total revenue divided by quantity of milk sold. Nevertheless, only the absolute average price of milk received by independent farmers was considered for this study

Table 4.13: Milk marketed and consumed.

Variable	Non Cooperative Members	Cooperative Members
Quantity Marketed (litres)		
Per week	105	167
Per month	420	660
Quantity consumed/spoiled		
Per week	22	16
Per month	88	64
Price /litre	8.5	7.2

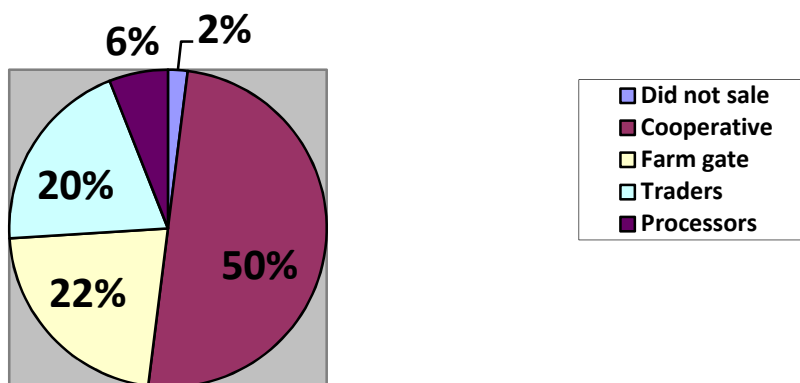
Source: Survey data, 2014

4.3.5 Milk Marketing Channels

Marketing channels and marketing outlets are important in describing a marketing system. There are two marketing channels used for the marketing of dairy products; the formal and informal marketing channels. Results from the survey indicate that the informal marketing channel was the major channel used by farmers in the study areas. More than 80% of the milk marketed in the study areas was channelled through the informal marketing system, as indicated by Figure 4.2. The marketing of milk mainly involves direct sales; delivery of raw milk by farmers to consumers in the immediate communities; or sales to traders or individuals and cooperatives. Informal markets are preferred because of the nonexistent or less quality control measures that farmers have to comply with. The primary marketing outlets in the studied areas are presented in Figure 4.1. According to the results of the survey, 50% of farmers sold their milk only to co-operatives; 22% sold at the farm gate and directly to consumers; 20% sold to traders such as shops, restaurants; 6 % sold directly to processors; and lastly, 2% of the farmers did not sell. In addition, 32% of farmers selling to co-operatives reported selling part of their milk to other markets that pay a higher price than what co-operatives pay, which negatively affects milk supply to the collection centre. When selecting

a market outlet, 57% of sampled independent farmers reported using better price (47 %) as selection criteria, 17.7% used proximity and 13.5% reported using both price and proximity as criteria for selecting outlets. Farmers who sold their milk directly to consumers benefited from high consumer prices compared to those who sold to traders, processors and co-operatives, hence receiving high returns. Farmers therefore prefer selling their milk at the farm gate or to individuals in the immediate community because of the high returns involved. On the other hand, farmers who sold their milk to traders were those with larger herd sizes who therefore produce more milk and require marketing outlets that easily accept large quantities of milk. This is an indication that existing market options need to be improved as well as the pricing system in order to encourage smallholder farmers to sell more milk. Subsequently, this will improve dairy production as well as marketing activities of smallholder farmers.

Figure 4.1: Milk marketing outlets and distribution



Source: Survey data, 2014

Price determination

Independent dairy producers set their own prices of milk when selling to consumers; however, at times they have to negotiate prices when selling to traders. Price determination in the study areas mainly depends on production costs, the competitor's price as well as supply and demand of milk in the country. These prices vary between rural and urban places. For farmers in urban and peri-urban places, prices are competitive because of the high demand of milk in urban areas, but lower for farmers in remote areas. As stated in the previous section, the highest price attained by independent farmers for a litre of milk is 8.50 birr and the lowest price was 6 birr. In addition to this, co-operative farmer selling price ranged between 5 birr and 7.50 birr. The average price they received was lower than average price received by independent farmers. Co-operative farmers only sell milk at prices set by the cooperatives. The marketing channel used also has an influence on price determination. Farmers who sold direct to consumers, which in this case were mostly independent farmers, received higher prices for their milk, and hence higher returns compared to co-operative members and farmers who sold to traders. The average price for farmers who sold to traders was lower than farmers selling direct to consumers. This is because price determination for these farmers is partly based on the relationship between the trader and the farmer, however, in some instances the traders determine the price for the farmers resulting in lower prices per litre of milk. Co-operative members, on the other hand, sold their milk at fixed prices determined by the co-operatives. Although prices set by cooperatives are lower, the fixed price factor helps in controlling price uncertainties or fluctuations experienced by independent farmers. Regardless of the high demand of milk in the country, farmers are unable to get profitable prices for their milk. Further, because of their poor record keeping systems, farmers cannot determine a justifiable standard price for their raw milk. So efforts need to be made especially by the government and all stakeholders involved because smallholder farmers do not benefit from the prevailing marketing system.

4.3.6 Access to Services

Table 4.14 provides information on access to credit, extension and market information which play a vital role in the promotion of agricultural production and marketing, thereby improving farm income.

Access to Credit

According to the survey results in Table 4.14, 35% and 14% of sampled co-operative and non co-operative members respectively had access to credit. This is an indication that cooperative participation of smallholder farmers has made a slight contribution in meeting farmers' credit needs. Access to credit is one of the factors for successful dairying as farmers need credit to improve their investment in new and improved technologies. Inability to access credit inhibits production and hence there is a need for the improvement of credit availability.

Access to Extension Services

The provision of extension services to farmers is mainly the government's role. It is meant to improve production capabilities of smallholder farmers; however, a number of smallholder farmers are still unable to access these services. As shown in Table 4.14, 80% and 51% of co-operative and non co-operative farmers respectively received dairy production extension services; and 75.5% and 59% of co-operative and non co-operative farmers respectively had access to current market information. Farmers in co-operatives have extension officers specially allocated to them. Extension officers and cooperative experts also attend monthly co-operative meetings to monitor operations in the co-operatives. In most cases, extension officers become chief advisors of farm management practices and this have positively contributed to farmers' milk production and management practices.

Access to Market Information

The survey results indicate that dairy farmers had access to a selection of market information sources (Table 4.14). On average, 75.5% and 59% of co-operative and non co-operative members respectively had

access to current market price information. Farmers relied on both formal and informal sources of information. From the results, the main sources of information were extension agents, co-operatives, friends and the media. A higher percentage of dairy co-operative farmers mainly relied on formal sources of information and the good network system facilitated disseminating of information in cooperatives. Overall, the results in terms of the t statistics indicate that co-operative farmers had better access to services (credit, extension and information). This implies that co-operatives have enabled improvement of access to these services among farmers.

Table 4.14: Access to service

Variables		Non co-operative members (%) n = 45	Co-operative members (%) n = 45	t value
Access to credit	Yes	14	35	2.9
	No	86	65	
Access to extension service	Yes	51	80	8.4
	No	49	20	
Access to Market information	Yes	59	75.5	1.53
	No	41	24.5	
Source of market information	Extension agent	52	80	
	friends/ other farmers	53	10	
	Media (radio, Tv,news paper)	15	10	

Source: Survey data, 2014

4.4 BENEFITS OF CO-OPERATIVE PARTICIPATION

Farmers that are members of a dairy co-operative were asked to state the benefits of being a co-operative member compared to when they were operating individually. It is evident from the results (Table 4.15) that the main benefit of being a co-operative member is that it presents a secure market outlet (marketing of milk). However, farmers were not happy with the price they were paid for a litre of milk. Improvement of income has been through the lump sum payments made by co-operatives to the farmers monthly for

their milk sales. Farmers are paid at the end of every two week for the milk they sell daily to the cooperative which is an inconvenience according to 70% of co-operative farmers because they often unable to meet their daily expenses (e.g. feed, transport, etc). Farmers expressed their preference of receiving a lump sum compared to daily payments for small transactions; although they stated that would prefer the lump sum to be paid every two weeks. Co-operatives not only create economic benefits for member farmers but they are also a social group which improves social networks among farmers.

Table 4.15: Benefits of being a co-operative member

Benefits	Frequency n=45	Percentage (%)
Marketing of milk	35	77.8
Acquisition of new technics and ideas	26	57.8
Provision of market information	21	46.7
Accessability to creadit	15	33.3
Accessability to piped water	11	24.4
Improvement of income	15	33.3
Strengthening of social networks	12	26.7
Provision of inputs	13	28.9
Improvement in milk handling	10	22.2

Source: Survey Data of 2014

4.5 CONSTRAINTS EXPERIENCED BY DAIRY CO-OPERATIVES.

Problems experienced by co-operatives hinder their performance as well as fulfilling their objective of linking farmers to markets. Identification of problems experienced by cooperatives will help develop programs that will facilitate their performance and in turn enhance performance of individual members. Co-operative members were asked to give their own view on major organizational problems they are faced with and they identified ten problems which were ranked according to their importance. Table 4.16 presents the major problems experienced by co-operatives. From the results, the most important problems

were a lack of access to capital, shortage of milk supply and poor management. Problems experienced negatively influence services provided to farmers as well as the amount of milk supplied to the co-operatives and co-operative growth, making it difficult for co-operatives to provide the required services to farmers.

Poor governance in co-operative leadership is intensified by members' lack of participation in co-operative decision-making processes. Similarly, internal corruption has been cited as an important factor negatively contributing to co-operative expansion.

Table : 4.16 Constraints in dairy co-operatives (farmers view)

Constraints	Less important		Important		Very important	
	Number	%	Number	%	Number	%
Shortage of capital	6	13.3	32	71.1	7	15.6
In adequate milk supply	7	15.6	32	71.1	6	13.3
Poor Management	8	17.8	31	68.9	6	13.3
Transportation problem	9	20.0	31	68.9	5	11.1
Low member commitment	9	20.0	30	66.7	6	13.3
low member participation	12	26.7	28	62.2	5	11.1
Poor technical support	12	26.7	27	60.0	5	11.1
Poor marketing system	13	28.9	24	53.3	6	13.3
In adequate training	13	28.9	23	51.1	9	20.0
lack of lowality among committee members	17	37.8	21	46.7	7	15.6

Source: survey data, 2014

4.6 OPPORTUNITIES IN THE INDUSTRY

According to secondary data available on the status of the dairy industry, the following were discovered to be existing opportunities that smallholder farmers have in the industry.

4.6.1 Local Milk Market

Future projections indicate that the demand for dairy products in the country will continue to increase for the next decade. Milk produced by small-scale farmers would therefore have an assured market. However, this will require continued expansion of specialized dairy breeds and an increased level of inputs matched to good market linkages for milk sales and input acquisition. This can be achieved through formation and improvement of producer organizations and co-operatives to facilitate the improvement of market access and market functioning, as well as the improvement of services and input supply. Through producer groups and co-operatives, small-scale dairy farmers can practice value addition to enhance their income levels. However, it is vital that these co-operatives are well-functioning in order to meet their objectives.

4.6.2 Good Feeder Roads

The study area has relatively a good and reliable feeder road network that would facilitate the collection and distribution of milk. However, the government together with the concerned bodies has to revive collection centers for the improvement of milk collection and marketing. Dairy product processor in the country operates far below its capacity because of milk shortages, and can thus benefit from the collection centers. This in turn will provide farmers with a reliable market which will also stimulate milk production at farm level, although milk processors do not pay well.

4.6.3 The Establishment of Credit Facility

Dairy cooperative union in collaboration with interested non government organizations have jointly established a credit scheme specifically for smallholder dairy farmers which will go a long way to alleviate the problem of a lack of suitable credit for small farmers. After getting loans, they were continuously supervised by market and credit officers from cooperative office; cooperative union and NGO project officers to ensure that they are productive. However, the criteria used to access the loans are

still stringent for farmers and need to be improved. In addition, the repayment period is short (two years) for smallholder farmers and is characterized by an interest that is still high for smallholder farmers.

4.7 ANALYSES OF TRANSACTION COSTS IN THE SMALLHOLDER DAIRY FARMERS

4.7.1 Transaction Costs Incurred By Smallholder Dairy Farmers

Dairy producers are faced with different transaction costs in dairy production, both observed and unobserved. However, the nature of milk is the main cause of transaction costs in dairy production, as discussed in Chapter 3. Milk as a perishable product is associated with high transaction costs in production as well as marketing. This limits marketing options available to smallholder farmers and implies greater losses due to spoilage of milk than non perishable products. Apart from the nature of milk, problems and challenges faced by farmers will be used to explain the effect of co-operative participation on transaction costs in this chapter. Table 5.1 presents transaction cost factors that co-operatives have positively contributed in their minimization.

4.7.2 Nature of milk as a product

Transaction costs in milk production particularly materialize from the fact that milk is a time-specific product which puts farmers under pressure to sell it. Because of its perishability, recurrent deliveries have to be made to the market and during the transportation process; farmers have to preserve the quality of milk. These factors contribute to high transaction costs in dairy production.

The frequent deliveries that have to be made to the market to avoid losses from spoilages result in high transport costs which are the main contributor to transaction costs in dairy production. Processing of milk helps preserve milk quality however it is extremely minimal at farm level. In addition, farmers lack storage facilities such as milk coolers hence they are forced to sell their milk on daily basis to avoid milk spoilages considering that a number of them rely on informal markets to sell their product. Accessible markets are usually located far from where farmers are situated and hence they have to travel long

distances to sell their milk. High transportation costs increase marketing costs and limit marketing options available to farmers. Subsequently, a higher percentage of milk is sold at the farm gate or to less lucrative markets. From the results of the survey, co-operative members incur 38% lower transportation costs compared to independent farmers. High transportation costs can be attributed to the fact that farmers sell mainly to traders and other market outlets where they are required to travel longer distances to the market. In addition, independent farmers transported their milk by public transport, which is very costly for them. Because of a lack of access to credit, farmers are unable to invest in their own to end up selling their milk to less lucrative markets, considered as a better option by farmers. On another note, milk is easily spoiled because of its perishability, resulting in losses. The results also indicate that non co-operative farmers incur more losses compared to co-operative members. Milk losses mainly from spoilage of milk were considered. According to farmers interviewed, the main contributors to their losses/spoilage are unhygienic milk handling, inadequate cooling systems especially at farm level as well as inadequate markets. A considerable portion of milk appears to be lost through spoilages which accounts for 2.4 and 7.9 percent of milk produced per month for co-operative and non co-operative farmers respectively. This negatively affects the amount of milk sold by farmers. To avoid spoilages, farmers are required to invest in chilling facilities as well as good quality transportation equipment to keep milk in good condition. Results of the survey indicate that farmers lack chilling facilities to maintain the good quality of their milk. Only 34% of smallholder farmers were in possession of refrigerators. The lack of chilling facilities therefore creates a problem because evening milk cannot be properly stored, and thus it is either consumed, fed to calves or used for sour milk production. This results in losses to farmers because even if milk is used for sour milk production, almost two litres of milk is required to make one litre of sour milk. From the above discussion, it can be gathered that co-operatives have indeed made a slight contribution to the minimization of transaction costs resulting from the nature of milk. This is because co-operative

members travel a shorter distance that is 45% less to the collection centre as their market outlet compared to the distance travelled by independent farmers. For this reason, co-operative farmers are spending less on transport. Because of the shorter distance travelled, farmers can sell their morning and afternoon milk. Results indicate that co-operative members sell 24.5% higher than independent farmers because of shorter distances, low consumption rates and low spoilage levels. In addition, results indicate that farmers have a reliable market where they can sell their milk twice a day and all year round unless they decide to cease being co-operative members. Co-operatives therefore provide farmers with a reliable market outlet and farmers do not have to search for reliable buyers or markets. Because of the reliable market offered by co-operatives, smallholder dairy farmers can better withstand risks arising from production. This implies that farmers participating in co-operatives incur lower marketing activities of independent farmers, compared to co-op members who have a reliable source of information. In this regard, co-operatives are said to have played a positive role in lowering costs associated with information search. Co-operatives therefore have made it possible for farmers to access current and reliable market information despite their location, in the process lowering information search costs. This is also facilitated by the fact that the flow of information in co-operatives is much more successful as it is channeled through established social networks and is therefore likely to have a higher multiplying effect. In the following sections, factors contributing to high search and bargaining costs are discussed to give a clear picture of whether co-operatives have positively contributed to lowering these costs.

4.7.3 Poor information sources

Smallholder farmers are constrained by a limited access to information which hinders their production and marketing activities. A limited access to information increases transaction costs by raising search, screening and bargaining costs. A limited access to information makes small-scale farmers unaware of prices as well as market opportunities available for their products and hence they find it difficult to

participate in different markets. Information that farmers receive is mainly used for production and price determination to enable marketing of their product. Obtaining proper market information is crucial in dairy farming considering that milk is a time-specific product and that quality of milk is becoming more important. For dairy farmers to be in a better position to sell their produce in more lucrative markets, they need information about those markets as well as prices they can use to sell their products. The information available to farmers varies, particularly with market outlets and locations of farmers. Farmers with better access to market information experience lower transaction costs because they can make informed decisions that positively affect their production and marketing activities. Literature states that a key assumption in the institutional theory is that information is a commodity that can be purchased. Thus, for farmers to access information, they have to incur certain costs because institutions (government extension services) that are supposed to disseminate market information are poor. Farmers who sell to co-operatives have the privilege of using the co-operative and extension services as sources of market information; as a result, they do not search for market information, unlike independent farmers. Contact with extension officers alone is not sufficient in improving marketable surplus; however, a higher education level is vital because it enables better interpretation of information received. Sampled farmers who had a higher education level could thus better interpret information received, which was reflected by the slightly higher amount of milk sold by co-operative farmers. This indicates that co-operative members experience lower information search costs than those experienced by independent farmers. From the results of the survey, access to market information is made possible by the regular visits (7.5/year) paid by extension officers who also attend all monthly meetings held by co-operatives. Independent farmers are visited by an extension officer four times a year, especially those who use the AI service. Two extension officers are assigned to focus areas and provide farmers with current and reliable dairy-related information as well as advice that farmers may need. This implies that farmers have regular access to accurate and current market

information they need for their production and marketing activities, and can hence make informed decisions. Unregistered farmers as well as those not using AI for breeding rarely get visited by extension officers because of limited resources for the provision of such services. This limits their easy access to market information implying that farmers have to search for market information, which in turn promotes reliance on informal sources of information. Over 80% of co-operative members relied more on formal sources of market information compared to 60% of independent farmers. Over 30% of independent farmers mainly depended on family, friends and fellow farmers for information. These sources of information can be unreliable at times and result in uncertainties in production and marketing activities of independent farmers, compared to co-op members who have a reliable source of information. In this regard, co-operatives are said to have played a positive role in lowering costs associated with information search. Co-operatives therefore have made it possible for farmers to access current and reliable market information despite their location, in the process lowering information search costs. This is also facilitated by the fact that the flow of information in co-operatives is much more successful as it is channeled through established social networks and is therefore likely to have a higher multiplying effect. In the following sections, factors contributing to high search and bargaining costs are discussed to give a clear picture of whether co-operatives have positively contributed to lowering these costs.

4.7.4 Limited access to resources.

Smallholder dairy farmers lack access to resources which seriously hinders their production and marketing activities. Limited access to resources is said to contribute to high search and bargaining costs incurred by smallholder farmers. This mainly includes a lack of access to credit and dairy breeds. As indicated in the previous chapter, majority of farmers lack access to credit. Farmers have to search for credit providers that will help them to access credit on affordable terms, considering that farmers do not have collateral which most credit providers require. Credit providers offer this service on a short-term basis, which is not

conducive for small-scale farmers, and consequently farmers have to search for cheap credit providers. Farmers are unable to improve their production, because they are limited by lack of investment, improved technology, such as improved dairy breeds and hence produce lower quantities of milk resulting in lower marketable quantities. In this regard, co-operatives have made a slight contribution to access of credit by smallholder farmers. Results presented indicate that 35% and 14% of co-operative and independent farmers respectively had access to credit, although a higher percentage of farmers are still limited from accessing credit. This has been made possible by the regular income received monthly (compared to variable income received by independent farmers) which provided some sort of security that farmers will be able to repay the loan. Searching for credit providers is therefore lower in the case of co-operative members compared to independent farmers. Despite the above, co-operatives have not made much contribution in the access to credit because, judging from the results, farmers are still citing a lack of credit as a major problem. This may be attributed to the fact that farmers are granted small loans that do not cater for their requirements; thus improvement in credit sources is a necessity. In addition, dairy breeds have to be mainly procured from South Africa and, in some cases, locally from large-scale farmers. Farmers end up buying poor quality animals available in the country because of problems associated with obtaining good quality breeds. The lack of easy access to breeds also causes farmers to search for cheap providers of these breeds, resulting in higher search and bargaining costs resulting from bounded rationality. When farmers decide to buy dairy breeds through SDB, the opportunity cost of waiting for animals to be delivered is high. According to extension officers, farmers have to wait for more than three months for their animals to be delivered to them because bulk buying has to take place. Co-operatives therefore facilitate easy access to dairy breeds, since being in a group enables farmers to buy collectively, whereas independent farmers have to wait for other farmers who need animals before they are able to acquire their own. The opportunity cost of waiting for other farmers translates to unobservable transaction

costs because farmers are limited in accessing animals in time, which has a negative effect on the amount of milk produced and sold.

4.7.5 Seasonal availability and high cost of feed

Seasonal availability and the high costs of feed contribute to search and bargaining costs (Table 5.1). Feed is the most important input in dairy production. It can be gathered from the previous chapter that grazing is the primary source of feed and grazing is mainly possible in summer. During the winter season, pastures become dry and result in a scarcity of feed. Farmers are then compelled to either practise inventory management in the sense that they harvest grass in summer to conserve its nutritive value and store it as hay or rely on purchased feed. Due to the scarcity of feed in winter, animals are given feed of poor quality which negatively contributes to poor milk productivity and low income. Farmers are forced to search for good sources of feed supplies, resulting in transaction costs. In addition, seasonal availability of feed implies that farmers have to rely mostly on purchased feed (concentrates and fodder) which becomes expensive for farmers. This is indicated by the high cost of feed that farmers spend monthly. Not all farmers rely on purchased feed because some farmers practice, inventory management in summer as well as grow legumes and produce silage as concentrates to be used in winter. Feed concentrates are expensive to smallholder farmers, and hence to avoid the use of poor quality feed, farmers have to look for alternative suppliers of cheap good quality feed. They sometimes have to spend time searching for suppliers offering lower prices because of their low bargaining power which results in high bargaining costs caused by information asymmetry. This result in high transaction costs that in turn result in lower income as well as lower quantities of milk sold in markets. Co-operatives on the other hand help farmers to purchase feed (concentrates and hay), particularly in winter when feed is scarce. Co-operatives purchase dairy meal and hay in bulk depending on the demand by farmers and the money is deducted at the end of the month from farmers' pay checks. Co-operative member farmers in this way are able to

maintain a continuous supply of good quality feed throughout the year, hence lower search costs. However, farmers still pay the same price as prevailing market prices for feed provided because of limited membership that makes it impossible for co-operatives to achieve economies of scale despite of bulk purchasing. As a way of minimizing costs, farmers then use less than the recommended rate of feed which results in low production levels especially in winter with cows producing milk between 5-7 litres per day.

4.7.6 Sale of animals

Part of dairy farmers' income comes from the sale of farm animals, especially male calves. This contributes 10% to the total income received by farmers. When farmers venture into the process of selling their animals, they incur search and bargaining costs. Limited feed resources do not allow farmers to keep male calves and sell them when they are older. For rural farmers, rural sale yards act as a market outlet for their animals and flexibility for farmers to charge their own prices do not exist. Instead, the buyers are responsible for determining the prices, which results in extremely low prices. Their low bargaining power results in lower prices for their animals because finding a buyer who is willing to pay a good price is challenging for smallholder farmers. Farmers require market information on sale dates and those who sell to random buyers need to search for those buyers and negotiate for a price. In the process, farmers incur transaction costs associated with searching for information and buyers. Co-operative farmers, on the other hand, sell their calves through the co-operatives, although some farmers do search for buyers who will pay a better price. Therefore, it can be stated that their efforts to obtain information and search for buyers decreases in comparison to the efforts of independent farmers. Extension officers supply farmers with information on where and when to sell their animals. Farmers in co-operatives have the assurance that their animals will be sold, whereas independent farmers often have to wait for long periods before their animals can be sold, which also contribute to transaction costs.

4.7.7 Processing and distribution of milk (quality standards)

The production and processing of milk impose strict quality standards that farmers cannot meet because of their limited investment and poor hygiene standards, especially when they have to sell to formal marketing channels. Although formal marketing channels, such as processors and supermarkets, require farmers to meet product quality, timeliness and traceability requirements, many farmers are unable to meet these requirements which are often too high to comply with. For farmers to improve their milk quality, they need to invest in improved milk handling equipment and good practices. Undercapitalization and lack of access to credit inhibit farmers from making these investments. Co-operatives are a source of technical and management skills that can be applied to ensure that farmers meet quality standards. For this reason, co-operatives have invested in milk coolers, pasteurizers and transport, and are still in the processing of buying more processing equipment. The main challenge is at farm level because farmers have yet to improve their milk handling skills. It is estimated that 50% of farmers (both co-op and non co-op) complained of insufficient water, hence they cannot consistently keep milking equipment and the milking parlour clean and free from bacteria. Co-operative members do not suffer losses due to their poor milk handling practices because co-operatives accept milk and use it for sour milk production despite its poor state. However, lower price is then paid to discourage farmers from selling poor quality milk. On the other hand, independent farmers suffer losses when their milk is rejected by traders, processors or individuals, resulting in transaction costs. This implies that they have to search for alternative buyers or consume the milk (forced consumption).

Table 5.1 presents some of the transaction cost factors that co-operatives have positively contributed in their minimization. These are the factors identified from looking at farmers' problems and constraints in the industry.

Table 5.1: Transaction cost factors co- operatives have contributed on.

Transaction cost factor	Type of transaction costs co-operatives have positively contributed on	Implications
Distance	Transport	Low distance traveled, reduction in losses
Transport cost	transport and transfer	Lower transport cost
Extension service	Information	Improved access to market information
Market access	Search and bargaining	Reduction in losses, high marketable milk, low bargaining and search for buyers of milk, low opportunism
Access to resources	Search and bargaining	Improved access to necessary resources such as, seed, credit, production stock
Sale of animals	Information, search and bargaining	Timely, and improved sale of dairy animals
Milk quality standard	Search	Reduction in milk loss, high marketable milk, low opportunism

Source: Survey results, 2014

Table 5.1 indicates that co-operative members incur lower transaction costs because they have better opportunities compared to independent farmers. They travel shorter distances, have better access to market information, improved access to resources as well as sell higher quantities of milk compared to independent farmers. Through co-operatives, farmers have access to current and reliable market information despite their location, in the process of lowering information search costs. In addition farmers have a ready market available for the products as well as their animals implying that they do not have to search for buyers. Information on where and where to sell their animals is readily compared to independent farmers who often have to wait for long period before their animals before their animals can be sold. However, contribution of cooperatives to lower transaction is still minimal hence improvement in cooperatives can contribute significantly to lower transaction costs.

4.8 ECONOMETRIC ANALYSIS

4.8.1 Introduction

The descriptive results presented in the above section suggest that co-operatives in the study area have a positive influence on certain transaction cost factors, such as access to market information and transportation costs as well as location of farmers. This is in line with similar studies in the literature showing that dairy co-operatives have improved market participation, technology used by farmers, capital accumulation, milk output and sales as well as access to market information. The econometric analysis in this section was employed to confirm whether dairy cooperatives have indeed contributed to a reduction of transaction costs in the production and marketing of milk.

4.8.2 Model estimation

One of the main objectives in the study is to determine whether co-operatives have a positive influence in minimizing transaction costs among dairy producers. A multiple linear regression model was chosen for this analysis because of the dependant variable being of count data. Various studies have pointed out that the level of transaction costs incurred can be determined through the level of market participation or the amount of output marketed because of the difficulty involved in determining transaction costs. As mentioned earlier, transaction costs have a large unobservable component that makes their determination difficult. Staal *et al.* (1997:782) suggested the use of the marketable portion of milk as evidence of commercialization by smallholder farmers because of difficulties in observation of transaction costs. Accordingly, the amount of marketable milk will be used in the study as a proxy for transaction costs to determine the effectiveness of cooperatives in minimizing transaction costs. It is hypothesized that co-operative farmer members incur lower transaction costs per output sold as they sell higher quantities of milk compared to independent farmers. Cooperative membership has been cited as a solution for farmers to minimize transaction the process lowering information search costs. In addition farmers have a ready

market available for their produce as well as their animals implying that they do not have to search for buyers. Information on where and when to sell their animals is readily compared to independent farmers who often have to wait for long periods before their animals can be sold. However, contribution of cooperatives to lower transaction is still minimal hence improvement in co-operatives can contribute significantly to lower transaction costs.

4.8.3 Variables in the model and hypotheses.

Dependent Variable.

Marketable milk quantity in litres (Mktblemlk): This is the observed amount of milk that can be sold or effectively supplied by a farmer. It is a proxy for transaction costs and indicates the effectiveness of co-operatives in minimizing transaction costs. The higher this quantity is, the lower the transaction costs incurred by farmers.

Independent variables (explanatory)

Co-operative participation (Co-oppart): This is measured as a dummy whereby a value of 1 indicates a farmer is a co-operative member and zero indicates a farmer is not a co-operative member. Co-operative participation is hypothesized to have a positive contribution on the amount of milk sold. Co-operative farmers are expected to sell higher quantities which will be an indication of lower transaction costs incurred. Co-operative participation contributes to reduction in losses, market availability, access to market information as well as reduction in distance travelled resulting in lower transportation costs. Thus co-operatives enable farmers to sell more milk.

Age: This is expected to have a positive effect on the amount of milk sold. Older farmers are more knowledgeable and are believed to be more efficient in resource use than younger farmers, and therefore produce higher quantities of milk which results in a higher proportion of milk sold.

Farm experience of household head in years (FMEXP): Farmers with extensive experience are likely to allocate resources effectively, resulting in higher quantities of milk produced and hence more milk available to be marketed. Marketable surplus is expected to be positively related to farm experience.

Family size (FMLSZ): Dairying is a labour-intensive activity; therefore, the quantity of milk marketed is influenced by labour. A negative sign is therefore expected because larger households consume more milk hence have less marketable surplus.

Milk output in litres (Ttmotpt): The amount of milk produced significantly influences the amount of milk sold, hence it is hypothesized to have a positive contribution on milk marketed because an increase in total milk output results in a higher quantity of marketed milk.

Access to credit (Accrdt): This is measured as a dummy, assuming a value of one if the household has access to credit and zero otherwise. It is expected to positively influence the marketable supply of milk on the assumption that it improves the financial capacity of dairy households, enabling dairy farmers to buy more improved dairy cows, thereby improving milk production which in turn results in more milk being marketed.

Access to market information (Acmkinf): Access to information significantly influences the amount of milk sold by farmers. It is represented by the extension service which is the number of visits by an extension officer per year. The extension service broadens farmers' knowledge, especially with respect to the use of improved production technologies and provides farmers with current market information. This improves dairy production as well the use of resources and enables farmers to make informed decisions. A positive coefficient implies that access to the extension service improves access to information and hence lowers information costs incurred. The higher the number of visits, the lower the transaction costs incurred because of improved access to market information.

Distance to market in km (Distnc): This is the location of the dairy household from the nearest milk market outlet and it has a bearing on access to markets. The closer the household is to a market, the lower the transportation costs, losses due to spoilage and better access to market information and facilities. This improves the amount of milk sold and increases the farm gate prices. Distance is hypothesized to negatively affect the marketed amount of milk, because the shorter the distance, the higher amount of milk sold due to lower transaction costs incurred by farmers.

Table 5.2 Description of variables used in the linear regression model

Variable	Description	Value	Expected sign
Mmilk	amount of milk sold	Literes	+
Fpart	Farmers participation in cooperatives	yes =1 No= 0	+
Age	age of house hold head	no of years	+
Fmexp	Farm experience of farmer	no of years	+
Fmsz	Family size	Man equivalent	-
Ttoutp	Total out put of milk per day	Literes	+
Acckinf	Access to market information	no of visits by extension officers per year	+
Accrdt	Dummy variable measuring access to credit	1 = access 0 = No access	+
Dist	Distance to point of sale	kilometers	-

4.8.4 Impact of co-operatives on transaction costs

This section presents the results of the model used to determine whether co-operatives do minimize transaction costs. This has been achieved by using marketable surplus as a proxy for transaction costs in the sense that a higher amount of milk sold would imply less transaction costs per unit of output sold. A linear regression model was used for this purpose and the estimation procedure was performed through STATA 10. The model used is stated in the above section. Table 5.3 presents the results of the model estimation on the effect of co-operatives on minimizing transaction costs. As shown by Table 5.3, the

model correctly explains 67% of the variation and is highly significant. According to the results presented, Co-operative participation, milk yield and access to market information were positively related to marketable surplus, whereas distance and household size were negatively associated with marketable surplus of milk as expected. The variables used both significant and non significant had expected signs.

The results indicate that being a co-operative member has a considerable, significant effect on increasing the amount of milk sold by farmers, and it was significant at 5%. This suggests that co-operative farmers sell higher amounts of milk compared to independent farmers, hence lower transaction costs are incurred. Therefore, being a co-operative member lowers transaction costs incurred by smallholder dairy farmers because it facilitates access to new reliable market opportunities where they can sell their produce. Total milk output also exhibited a positive relationship with the marketable surplus of milk, and was also significant at 1%. The positive relationship signifies that farmers producing high quantities of milk sell a higher amount of milk compared to farmers producing lower quantities of milk. From the results presented in the previous chapter, co-operative members produce more milk and, with a higher output, farmers tend to look for unrestrictive market outlets, particularly because milk is easily spoiled, and hence needs to be sold within 6 hours of milking if it cannot be processed or stored. Co-operatives therefore enable farmers to sell both their morning and afternoon milk without any restrictions which increases the amount of milk sold. With a decrease in losses incurred, farmers can sell a higher percentage of their total production, and thus lower transaction costs are incurred. Household size exhibited a negative relationship to marketable surplus as expected however it was not significant. This implies that co-operative farmers have bigger family sizes contributing to high consumption of milk which reduces quantity of milk marketed. In spite of this, co-operative farmers sell more milk compared to independent farmers attributed to readily available market and the fact that they are situated close to co-operatives. This is also an indication that these farmers could be selling more than what they currently sell. Access to market information

significantly increases the amount of milk sold by farmers. It was significant at a 5% level. In this case, it is represented by the extension service, which is the number of visits by an extension officer per year. The extension service broadens farmers' knowledge, especially with respect to the use of improved production technologies and provides farmers with current market information. Being a perishable product, milk requires current and rapid information about markets. The extension service assists in providing farmers with current market information and marketing processes which farmers do not have to pay for. This improves the use of resources and enables farmers to make informed decisions due to better utilization of market information provided, and hence an increase in marketable surplus. With access to extension service, information as well as marketing costs are reduced as farmers do not have to search for information. The higher the numbers of visits, the lower the information costs are and, overall, the lower transaction costs incurred. This implies that co-operatives do have an impact in minimizing transaction costs resulting from information costs. The results also indicate that the distance to the market or point of sale also significantly increases marketable surplus of milk. The distance was significant at a 5% level and it is one of the main contributors to high transaction costs through transportation costs. From the previous chapter, it has been indicated that co-operative farmers travel shorter distances to sell their produce and hence they sell more milk. The results imply that they spend less on transport costs and incur minimal losses which in turn reduce transaction costs. The results concur with the above descriptive analysis that co-operatives do have a positive influence on minimizing transaction costs resulting from high transportation costs, because of the reduction in distance from the farm gate to the point of sale. Factors such as farm experience, age and access to credit were expected to positively and significantly influence marketable surplus of milk. However, the survey found these factors to be only positive and not significant.

4.9 INSTITUTIONAL ISSUES WITHIN CO-OPERATIVES .

Co-operatives are also susceptible to organizational costs that inhibit their performance and success. From the results of the survey, free riding was identified as one of the main contributors to organizational costs that influence co-operatives' performance. Free riding exhibited by the members in studied co-operatives was indicated by non attendance in meetings as well as the share of milk members sold to the co-operative compared to the total amount of milk members sold. Decisions that affect co-operative operations as well as members are taken during farmers' monthly general meetings and results indicate that not all farmers attended these meetings, which portray lack of participation and commitment by members. Out of the six meetings held in the last year, 35% of farmers attended not more than two of these meetings. Reasons given by most farmers for non attendance were other commitment issues and lack of satisfaction with leadership of the co-operative. They further expressed their wish for certain changes in leadership, particularly transparency and accountability in the utilization of co-operative funds. This is an indication that a lack of trust prevails in co-operatives and is aggravated by dissatisfaction from delayed payment of farmers' income by the co-operatives. Farmers often receive their payment 7–10 days later than the stipulated date. Another instance that has contributed to a lack of trust is that funds contributed by members towards a certain investment project were diverted somewhere else without the consent of the members. This resulted in a loss of members and deteriorating trust within the group. The study also indicated that farmers sell part of their milk to alternative markets other than the co-operative. According to the results, 32% of co-operative members reported selling part of their milk to alternative markets (e.g. directly to consumers) that pay a higher price than co-operatives. This is one of the main difficulties co-operatives are faced with because it negatively affects milk supply. Farmers utilize resources, services and support offered by co-operatives to their own advantage by acquiring services and the support needed, but sell part of their milk to other market outlets. Consequently, the milk shortage resulting from members'

free riding inhibits growth because it negatively contributes to poor performance of co-operatives. Moreover, the survey found that farmers (15%) do not completely subscribe or pay their membership fee, yet they have access to all the benefits offered by the co-operative. This is characterized as free riding because farmers do not pay for services offered, yet they have access to all the benefits. By not paying their membership fee, farmers inhibit the growth and performance of the co-operatives because that money could be used for investment purposes. Farmers benefit in market access, training and extension as well as in any other services offered; they do not have to pay for these services yet they fail to pay their membership fee. This demonstrates a lack of commitment on the part of farmers. Farmer co-operatives remain small because of the opportunistic behaviour exhibited by members which inhibits co-operatives from growing. For co-operatives to be the best developmental instrument and to assist the smallholder sector to improve their production and marketing activities, the above problems have to be eliminated because they critically affect the growth and performance of co-operatives. Co-operatives' success as well as the success of individual members depends on the ability of the co-operative to concurrently manage opportunity maximization and opportunism minimization. In this regard, trust as a major ingredient to successful co-operation has to be promoted, especially through capacity building. Benefits in the form of higher prices from co-operatives can enhance farmers' commitment and as such reduce farmers' likelihood of behaving opportunistically.

4.10 SUMMARY

It can be gathered from both the descriptive and econometric analyses that co-operatives in the study area do have a positive effect in minimizing transaction costs resulting from transportation costs, losses incurred as well as information costs; although their contribution is not very prominent. This has been made possible by the reduction in the distance from the farm gate to the point of sale, the provision of market information as well as the provision of a reliable market where farmers can sell unlimited amounts

of milk. Moreover, co-operatives have minimized risks associated with price determination by fixing the price of milk paid to farmers. Although co-operatives have made a positive contribution in minimizing transaction costs, they are inhibited from better performance by members' opportunism and free riding. Therefore, considerable support is needed for the improvement of co-operatives to enhance their effectiveness in providing necessary services to farmers, which in turn will significantly lower transaction costs. Internal organization of co-operatives also needs improvement through capacity building.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION.

5.1 CONCLUSION.

The study was undertaken to determine the role of co-operatives in smallholder dairy production and marketing activities in the study area. It was a survey research whereby a sample size of 90 farmers (45 co-operative members and 45 independent farmers) was randomly selected and interviewed through a questionnaire. Data on their production and marketing activities was collected and analyzed. Both descriptive and econometric analyses were performed. An econometric analysis was performed to determine whether co-operatives have a positive influence in minimizing transaction costs incurred by smallholder dairy farmers. Results indicated that production systems of co-operative and non co-operative members do not significantly differ from each other. Both uses specialized dairy breeds, and have almost similar herd sizes as well as use the same feeding systems. However, farmers in co-operatives perform better in terms of production and productivity as well as sell more milk than independent farmers. This is mainly attributed to the fact that co-operative members have regular training and extension programmes that constantly provide them with vital information required for production and marketing of milk. Farmers sell more milk because of the reliable market offered by co-operatives enabling them to sell both their morning and afternoon milk, whereas independent farmers often only sell their morning milk. In

addition, independent farmers are not efficient in the use of variable inputs in the sense that more of variable inputs are employed compared to co-operative members. Informal marketing channel was mainly used to sell farmers' milk because of minimal restrictions on product quality. Main market outlets used were co-operatives, traders, farm gate and local community as well as processors. Moreover, the price paid by co-operatives was lower than the average price received by independent farmers which then results to lower income on the part of co-operative members compared to non co-operative members. The main benefits as indicated above include the provision of guaranteed market access as well as technical services, such as training and extension. The results of the descriptive analysis on transaction costs as well as results of the Linear Regression model revealed that co-operatives do have a positive influence in minimizing transaction costs incurred by smallholder farmers. This has been facilitated by lower information and transportation costs as well as by the provision of a reliable market where farmers can sell their milk. On the other hand, the main problems co-operatives are faced with include a shortage of capital, inadequate milk supply, poor management, transportation problems, low member commitment and poor technical support. Further, opportunities available to farmers include the availability of local milk markets characterized by a high demand of milk, the establishment of a credit guarantee scheme and good feeder roads that will facilitate milk collection.

5.2 RECOMMENDATIONS.

Based on the results of the study, the following recommendations are made for the improvement of smallholder dairy production, marketing and for the improvement of cooperatives.

The success of smallholder dairy farming and dairy cooperatives depends on four factors, namely the provision of technical inputs, institutional support, improvement in government policies and socio economic initiatives which all influence the success of smallholder dairy farming and decisions to expand

and improve dairy operations. Therefore there is a need for support programs by government and all stakeholders involved that will help to motivate individual farmers and strengthen cooperatives for better promotion of production and marketing of smallholder farmers. This includes a more supportive policy environment to reduce obstacles inhibiting the effective formation and management of cooperatives, infrastructure development access to financial and credit services improvement of markets and provision of effective training and extension to provide more extensive and dynamic opportunities for smallholder dairy development. This will positively contribute to reducing the high demand of milk that prevails in the country and enable cooperatives to diversify their operations which in turn will facilitate their effectiveness and sustainability.

Cooperatives effectiveness is constrained by organizational problems such as free riding a lack of commitment and participation low managerial capacities and a lack of trust. Hence there is a need for capacity building and member training to strengthen cooperatives functioning and internal structure. The improvement of management capabilities and skills of cooperatives members are essential for the development and sustainability of cooperatives. Further trained and experienced cooperative leaders will be in a better position to solve arising problems, & to enable for better performance of the cooperatives.

5.2.1 POLICY RECOMMENDATIONS.

Cooperatives have a smaller membership base and they are not effective in promoting dairy production and marketing of smallholder farmers. Therefore complementary institutions need to be designed to address the specific needs of the smallest farmers. This will motivate more farmers to join cooperatives and hence improve their membership base.

Smallholder farmers are receiving low prices for their products which is attributed to the prevailing marketing system in the country. This discourages investments in milk production and quality improvement. Therefore there is a need for a pricing policy improvement which will incentivize farmers to produce and sell more as well as invest in quality improvement.

5.3.2 Recommendations for Further Research.

The study on the role of cooperatives in smallholder dairy production and marketing may not be representative of dairy cooperatives in the whole country. Therefore it is suggested that a similar study be undertaken in all other areas.

Due to limited time and lack of fund allocated for undertaking the study, the performance of cooperatives could not be studied. Therefore it is also suggested that a study on the performance of cooperatives should be undertaken in the country in order to focus on development programs of cooperatives in specific areas. This will also enable the identification of success factors to enable replication of successful cooperatives.

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ANNEX A

PROJECT PROPOSAL

PROFORMA FOR SUBMISSION OF MARD PROJECT PROPOSAL FOR APPROVAL FROM ACADEMIC COUNSELOR AT STUDY CENTRE.

ENROLMENT NO 099108492

DATE OF SUBMISSION

NAME OF THE STUDY CENTRE: ADDIS ABABA ETHIOPIA

NAME OF THE GUIDE: WONDEMAGEGNE CHEKOL (PhD)

TITLE OF THE PROJECT: ASSESSMENT OF THE ROLE OF CO-OPERATIVES IN SMALL HOLDER DAIRY PRODUCTION AND MARKETING. (THE CASE OF BIFTU BERGA DAIRY COOPERATIVE UNION, OROMIYA NATIONAL REGIONAL STATE, WEST SHOWA ZONE, ETHIOPIA.)

Signature of the Student

Date

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Name: Dr. Wendimagegne Chekol

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**ASSESSMENT OF THE ROLE OF CO-OPERATIVES IN SMALL HOLDER DAIRY
PRODUCTION AND MARKETING. (THE CASE OF BIFTU BERGA DAIRY
COOPERATIVE UNION, OROMIYA NATIONAL REGIONAL STATE, WEST
SHOWA ZONE, ETHIOPIA)**

BY

KEFIYALEW BEYENE HUNDERA

**A PROJECT PROPOSAL SUBMITTED TO INDIRA GANDHI NATIONAL OPEN
UNIVERSITY IN PARTIAL FULFILMENT FOR THE DEGREE OF MASTERS OF
ART IN RURAL DEELOPMENT**

DECEMBER, 2014

ADDIS ABABA, ETHIOPIA

TITLE: ASSESSMENT OF THE ROLE OF CO-OPERATIVES IN SMALL HOLDER DAIRY PRODUCTION AND MARKETING. (THE CASE OF BIFTU BERGA DAIRY COOPERATIVE, OROMIYA NATIONAL REGIONAL STATE, WEST SHOWA ZONE, ETHIOPIA.)

1. INTRODUCTION

1.1 Background of The Study

Agriculture is the basis of Ethiopia's economy and is the most important economic sector in terms of generation of foreign currency. The sector is the primary sources of livelihood for more than 85 % of Ethiopian rural households who practice subsistence crop and livestock production. The current Ethiopian agricultural policy, which advocates ADLI, has led the Ministry of Agriculture to spearhead the intensification of activities in support of agricultural development. One concern is the overall improvement and development of the livestock sector (MoARD, 2007). Livestock is the source of income, which can be used by rural population to meet basic needs and purchase agricultural inputs. Livestock comes second to coffee in foreign exchange earnings in Ethiopia. Its contribution can equally expressed at household level by its role in enhancing income, food security and social status. Ethiopia holds large potential for dairy development, the country currently manages the largest livestock population, estimated at 29 million cattle, 24 million sheep and goats, 18 million camels, 1 million equines and 53 million poultry (Ahmed *et al.*, 2004). The dairy sector in Ethiopia holds large potential to contribute to the commercialization of the agriculture sector due to its large livestock population, the favorable climate for improved, high-yielding animal breeds, and the relatively disease-free environment with potential for animal feeding. Like other sectors of the economy, the dairy sector in the country has passed through three

phases, following the economic and political policy changes in the country. In the most recent phase, characterized by the transition towards market-oriented economy, the dairy sector appears to be moving towards a takeoff stage. Liberalized markets and private sector investment and promotion of smallholder dairy are the main features of this phase leading to the commercialization of the sector (Ahmed *et al.*, 2004).²

Even though the livestock sector in general and the dairy sector in particular have a huge Potential, it is constrained by shortage and fluctuation in quality and quantity of feed, poor and eroding genetic resource base, poor management practices, diseases, poor market infrastructure, poor service delivery and policy and institutional arrangements. To ameliorate the development constraints and realize the benefits from the huge but untapped livestock resource, efforts have been made in various aspects to develop the livestock sector. These efforts include the provision of input and services such as animal health, breed improvement, feed resources development, research, extension services and development, finance and marketing (Azage *et al.*, 2006). Ethiopia adopted an Agricultural Development-led Industrialization (ADLI) strategy, which initially focused on food crops and Natural Resources Management. More recently, the country has added market orientation to this strategy (FDRE, 2006). Increased availability and utilization of appropriate technologies, an effective and efficient service delivery system and sustained demand for the agricultural outputs are critical in such market oriented agricultural development efforts. Moreover, strengthened technology development and extension, markets and the demand side development, institutional competence and performance and integrated and co-ordinated service delivery systems are needed to transform the country's subsistence oriented agriculture to market orientation (Puskur and Hagmann, 2006). Collective action is commonly supposed to assist smallholders' engagement in markets, contributing to improvements in rural economies. Like in many other developing countries, this perception is largely shared also amongst policy- makers in Ethiopia, who do not hesitate to express

their overwhelming confidence in cooperative organizations as a driving force for rural development. The perception that collective action may contribute to boost the Ethiopian rural economy also holds true for the dairy sector. Organizing farmers through dairy co-operatives can have many advantages over individual farming. First, co-operatives can improve or facilitate access to market information, reduce costs of marketing and can increase producers' access to technology, extension and related services, and thereby enhance efficiency in the process of production and marketing of dairy. Second, dairy marketing co-operatives can help to decrease transaction costs and price risks, and enhance bargaining power of dairy producers. These lead to increased return from commercial dairying which, in turn, stimulates innovation in the sector (Beekman, 2007). Hence, the focus of this study is to investigate the major contribution of dairy cooperatives in improving the production and marketing of smallholder farmer's development focusing on Biftu berga dairy production and marketing cooperative union

2. Statement of the Problem

Ethiopia has set forth a comprehensive set of development objectives that target economic growth and reduction of poverty through strategies designed to promote a market-led transformation of the rural economy. This strategy places a great emphasis on commercialization of agriculture, diversification of production and exports, and private sector investment in order to move farmers beyond subsistence farming to small-scale market-oriented agriculture (MOFED, 2006). In the process of commercialization of the country's subsistence-oriented production systems to more productive and market oriented production systems, the agricultural support service has to transform towards being responsive and innovative (Tesfaye, 2007). In Ethiopia, dairy production system is not market oriented and milk produced by smallholders is primarily used for household consumption purpose. The surplus is processed in to butter, ghee, cheese and sour milk and sold through informal market (Redda, 2001). The primary reason

among others seems to be the inefficient dairy and dairy products marketing characterized by high margins and poor marketing facilities and services. Regardless of the challenges outlined above, market-oriented dairy production is still one of the promising avenues to improve food security and livelihood of rural households in Ethiopia. The opportunity for increasing income, employment, and improving food and nutritional security of rural households through smallholder commercial dairy development arises from many factors: 1) the expected increase in demand for milk and milk products in the country with increasing population, increasing urbanization, and expected increase in consumers income, 2) it is estimated that 50% of households in the highlands own cattle of which 56% are dairy cattle (Ahmed *et al.*, 2004), 3) the availability of technological and institutional options to deal with production and market related challenges, 4) the opportunities provided by the policy and institutional reforms being implemented, including liberalization and market orientation of development policy, decentralization, and pluralism in service delivery. The policy change has encouraged increased involvement of the private sector in dairy production, processing, marketing and in service delivery such as animal health and artificial insemination services. Market oriented smallholder dairy development in Ethiopia offers a great opportunity to improve food security and livelihood for the rural majority, including for the poorest of the poor and women. However, the sought transformation of the subsistence oriented dairy production systems to that of productive, market oriented and dynamic systems calls for technological and institutional innovations. Resource endowment is not sufficient to get the Ethiopian dairy sector moving, necessary though it is crucial. Agricultural knowledge and information are key components in commercial smallholder dairy development. Knowledge and information play a significant role in improving productivity, linking producers to remunerative markets, improving competitiveness in markets, and thus leading to improved livelihood, food security and national economies (Tesfaye *et al.*, 2008). A number of key ingredients are necessary

for achieving market orientation and also making this process inclusive. Innovation which emphasizes on putting available knowledge from multiple sources to economic use is critical for this to happen. Innovations such as the cultivation of high-yielding crop varieties, adoption of sustainable natural resource management techniques, sharing of indigenous knowledge and practices, using communication technologies to access market information, the development and use of new products, the involvement of new entities to support collaborative pursuit of specified goals, or changes in rules of the game, all have far-reaching impacts throughout the agricultural sector. Although these improvements operate through indirect, often complex, pathways, they can ultimately translate in higher incomes, greater food consumption, better nutrition and more sustainable resource use (World Bank, 2006).

The cooperative union under study has been providing different services to its members including AI, Concentrate feed, animal health care and marketing, training, dissemination of up-to-date information and other similar related services. However, tangible information is lacking on the role played by this dairy cooperative union in contributing to enhancement of marketing and production style of small holder members in particular and to their livelihood in general as compared to non members of small holder farmers who are dwelling in the study area and engaged in the same activity as that of members of the cooperatives.

Therefore, the focus of this study is to generate information on the role of Biftu berga dairy cooperatives union in improving production and marketing of smallholder farmers as compared to non cooperative members

3. Research Objectives.

The main purpose of the study is to assess the role that the cooperative play in the improvement of its members with respect to production and marketing. The studies have the following specific objective:

- To identify the major role that the dairy cooperative union played in improving the lives of members as compared to non members
- To examine the performance of dairy farmers participating in cooperatives as compared to those who do not participate in cooperatives.
- To identify key dairy cooperative constraints, opportunities, and make possible recommendations that could help in promoting small holder farmers through dairy cooperatives

4. Statement of hypothesis:

The hypothesis to be tested in this study is:

- **Hypothesis 1.** Dairy cooperative play significant role in small holder dairy production and marketing which results in a better performance in terms of productivity, marketing income levels and better management practices to cooperative members
- **Hypothesis 2.** Cooperative farmers incur low transaction costs per units of output sold

5. Location of the study area.

Biftu berga dairy cooperative union was established five years ago in October,2008. It is located in Oromiya National regional state, Oromiya special zone surrounding Finfine, Welmera district, Holeta town at, about 40 km west of Addis Ababa. Currently, the union covers three districts out of which two districts (Ejere and Ada'a barga) are belongs to west showa zone and the remaining one (Welmera) is located in Oromiya special zone surrounding Finfine. Currently the union has 13 primary dairy cooperative societies consisting of 645 household members (M 435 and 210) with an initial capital of 164,568birr. The purchase and collection capacity of the union per day is 3500 and 4500 liters of milk in

dry and wet seasons respectively. Nowadays, the milk is collected from member primary cooperatives and transported and delivered to large scale private processors in Addis. The union has also its own small scale processing equipments being supplied by NGOs like Self Help Africa and ACDI/VOCA. Major Current services provided by the union to its members include quality management and control, provision of concentrated feed, AI service, Veterinary drug, training, provision of market information and other similar related service.

Biftu berga dairy union is purposively selected for this study due to its less accessibility high potential of milk and availability of higher percentage of smallholder dairy farmers & relatively well developed infrastructure.

6. Sampling Design

Biftu Berga dairy production and marketing union was purposively taken for this study to assess the contribution of cooperatives in improving the smallholder dairy farmers in their production and marketing system. First a list of members and non members of the primary cooperative was obtained from the dairy union and from other reliable relevant sources. Then primary cooperative members will be stratified into three groups based on the district they are located. Next one from each member primary cooperatives in each district will be drawn purposively based on accessibility and ease for transportation. From each three primary cooperatives a total 45 households will be selected randomly using Probability Proportionate to Size (PPS). Similarly a total of 45 non member households will be selected randomly from the village of

three districts where the sampled primary cooperatives are situated. Based on this the total sample size for this study will be 90 smallholder farmers. The primary information obtained from sampled farmers will be also supplemented by information from focused group discussion with dairy union employees, board members, primary cooperative committees and key informants.

7. Method of Data Collection

Relevant data will be collected both from primary and secondary sources. Primary data will be collected by conducting field survey of sampled smallholder farmers who are cooperative and non cooperative members to gather information on their production and marketing activities through the use of pre-tested structured interview. Secondary data relevant for this research both published and unpublished will be collected from relevant sources like Biftu berga dairy union, primary cooperatives, district cooperative office and other appropriate government and non government sources including internet.

8. Method of Data Analysis

Up on completion of data collection, the data will be coded and entered in to Statistical Package for Social Science (SPSS version 12) computer program for analysis. Data were analyzed using different quantitative and qualitative statistical procedures and methods. Descriptive statistical tools will be used to general characteristic of sampled house hold, their production as well as their marketing system in order to depict the difference in performance between cooperative members and non cooperative members. The important statistical measures that will be used to summarize and categorize the research data were means, percentages, frequencies, minimum, maximum and standard deviations. Descriptive tools were supplemented by qualitative analytical methods (mainly for those data acquired through the participatory/ qualitative methods) like interpretation and explanation of various opinions, views and concepts; and summarizing, categorizing, and presentation of these in convenient forms.

9. CAHPTERAIZATION

This thesis will consist of five chapters. Chapter one deals with the general overview of the research problem it also includes, objectives, and scope of the study and significance of the study. Chapter two gives overview of the literature reviews on cooperatives and rural development, it further discusses the evolution of cooperative movement and looks at cooperatives in Ethiopia by reviewing the government policy. Chapter three Outlines the theoretical background of the study area and introduces the concept of cooperatives and gives summary of the chapter. The fourth chapter presents the results of the study and their interpretation. Chapter five is the final chapter which highlights conclusions and recommendations drawn from the research carried out; this also includes suggested area for possible research on cooperatives.

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ANNEX B

Data Collection Instrument

Farmers Questionnaire

Farmer's Questionnaire

A. General information

Name of farmer

Date of interview

Location: Rural Urban Semi-urban

Village name:

Are you Member of cooperative? Yes No

If yes name of cooperative

B. Household Characteristic

1. Gender of farmer: Male female

2. Age: <30 30 – 40 41 – 50 51 – 60 > 60

3. Educational level: No formal education primary education secondary education

other (specify)

.....

4. Household size

5. No of adults (above 18 years) working on the farm working off farm Total

6. No of children (below 18 years) Total Working on the farm

7. Dairy herd size: 1. <5 2. 5-10 3. > 10

8. Farming experience 1. <5 2. 5-10 3. > 10

9. Source of income: 1. Dairy 2. Other agricultural activities 3. Off farm employment

4. Other specify

10. Type Of Asset In The Farm

	Type of asset	Initial coast	Estimated use of life (years)	Current value of asset
1	Milking parlor			
2	Milking machine			
3	Milking utensils			
	1			
	2			
	3			
	4			
	5			
4	Dairy cows			
	1			
	2			
	3			
5	Chilling facilities 5			
	1			
	2			
	3			
	4			
6	Other			

C. Livestock owned at present

11. What type of livestock do you currently own?

	Type of animal	Type of breed	Total
1	Cows		
2	Bulls		
3	Oxen		
4	heifer		
	Sheep		
	Goat		
	Chicken		

D. Farm inputs

12. What are the inputs used for dairy production.

12.1 Non labor inputs

Type of inputs	Quantities used	Unit cost	Total cost/month
Feed: forage Hay Supplements Concentrates			
Breeding: Bulls : AI			
Veterinary			
Transports cost			

Electric city cost			
Water			
Other			

12.1 labor input.

	Activities	Unit Cost		Total cost
		Family labor	Hired labor	
	Feeding			
	Cleaning of milking parlous			
	Marketing of milk			
	Transporting of milk for sale			
	Dairy animals care			
	Caring for calves			
	Culling of dairy animals			

E. Production

Cows	No	of	No	of	Average milk yield	Average milk sold	Average
------	----	----	----	----	--------------------	-------------------	---------

	dairy cows	lactating cows	Per day liters	Per month liters	Per day Liters	Per month Liters	milk consumed
1.Indigenous (local cows)							
2. Breed							
2.1 Friesian							
2.2 Holstein							
2.3 Jersey							
Other							
Total							

F. Dairy marketing activities

13. Where do you sell your produce? 1. Cooperative 2. Farm gate 3. Trader
 4. Local market 5. Don't sell 6. Other (specify)

.....

14. Reasons for specified market channel: 1. Close to production site. 2. Offer better price
 3. Can get immediate cash 4. Collection centre is close by 5. Other(specify)

.....

15. Distance traveled to market (KM) 1. <5 2. 5 -10 3. 10-15 4. > 15

16. Are you satisfied with the marketing channel you use? 1. Yes 2. No

17. If no, why?

.....

18. Quality Of Milk Sold

Receiving agent	Quantity sold per week	Price per liter	Amount of money received per week	Amount of money received per month

Dairy cooperatives				
Farm gate				
Traders				
Local market				
Other				

Transports

20. How do you transport your milk to market? 1. Public transport 2. Own transport 3. On foot 4. Ox cart 5. Car hire Other (specify)

.....

21. How much does it cost to use the mode of transport you have mentioned?

.....

.....

22. Are there any major constraint in relation to transportation of your produce to the market?

1. Expensive 2. Poor roads. 3. Long distance. 4. Other (specify)

.....

.....

H. Good management and farm practice

Milking system

23. Which milking system do you use? 1. Manual 2. Portable milking machine

3. Fixed dairy parlour

Feeding system

24. Which type of feeding system do you use? 1. Stall feeding. 2. Grazing 3. Both

25. Type of grazing. 1. Communal. 2. Private 3.

26. Please indicate the type of feed given to the following animal

Type of animal	Type of feed	Season

1	Lactating		
2	Pregnant		
3	Dry season		
4	Calves		

Pasture establishment and management

27. Do you have planted pasture? Yes No

28. How big is the grazing land?

29. Do you sale fodder, if yes at how much?

Milk handling and hygiene

30. Are there any quality control measure taken to ensure milk is of good quality?

.....

31. What cost do you incur in application of the quality control measures?

.....

32. what are the problems encountered in ensuring milk is of good quality ? 1. Lack of training.

2. Poor milking utensils. 3. Expensive /costly/ 4. Other (specify) ``.....

.....

33. Is record keeping practiced on the farm? Yes No

34. If yes, which type of records are kept and why? 1. Milk production. 2. Inputs used and costs 3. Marketed milk. 4. Income 5. Other (specify)

.....

35. Is there a health management programe practiced in the farm? Yes No

36. Please state the type of disease control and cost for each disease?

	Type of diseases	Season	Control	Cost
1				
2				
3				
4				

Water source

37. Which source of water do you use? 1. River and streams 2. Pipe water
 3. Borehole 4. Other

Milk loses:

38. Do you incur any milk losses? Yes No

39. If so how much do you losses per week (liter)? 1. <5 2. 5-10 3. >10

40 what do you attribute the losses to? 1. Long distance to market. 2. Poor milk handling.
 3. Lack of cooling facilities. 4. Minimal market opportunities.
 5. Other

41. How do you deal with spoiled milk? 1. Used for home consumption. 2. Feed to calves.
 3. Used to make sour milk. 4. Given to neighbor 5. Other

House Hold Income

42. Source of income.

Source of income	Amount per month	Total amount per year
Milk sale		
Livestock sale		
Off-farm employment		
Remittance		

Farm income		
Other		

J. Provision of service

Training

43. Have you ever participated in dairy production training for the past three years? Yes No

44. If the answer is no what are the reasons?
 45. If yes specify the type of training and the organization responsible for training.

	Type of training	Duration	Organization
1	Proper milking and clean milk handling		
2	Record keeping		
3	Milk marketing		
4	Dairy health		
5	General farm management		
6	Pasture establishment and management		
7	Dairy cattle feeding		
8	Heat detection		
9	Other		

46. Has the training been helpful in gaining knowledge and skills to solve your practical problems related to dairy production and marketing. Yes

If no why?

47. What is your source of market price information? 1. Extension officer 2. NGO
 3. Radio 4. Newspaper 5. Cooperative 6. Other

.....

Extension service

48. do you have an extension officer operating in the area?

49. how many times does she/he visits you in a year? 1. <3 2. 3-5 3. 5-10
 4. >10 5. Not at all

50. Have the visits been helpful? 1. Yes 2. No

51. If yes how?

.....

Support provided

52. Please state support provider and type of support provided

Support provider	Type of support provided									
	1	2	3	4	5	6	7	8	9	10
Government										
NGO										
Cooperatives										
Microfinance institutions										
Other										

1= Training 2= Advisory service 3= Credit service 4=Provision of AI service 5=2= Provision of bull service

6= Veterinary service 7= Concentrated feed 8 = Fodder feed 9 = Breeding 10 = other specify

K. cooperative members

Membership of the dairy marketing cooperatives and benefits obtained

53. What were the main reasons motivating you to be a member of the dairy cooperatives?

1. To get secured market for milk 2. To get dairy inputs timely and with fair price
 3. To get dividends from the cooperatives. 4. To get education, training and advisory service

from the cooperatives To gain access to credit Other specify
.....
.....

54. How long have you sold milk to the cooperatives? 1. <1 year 2. 1-3 year 3. > 3 year

Benefits of being cooperative member

55. ways in which the cooperative has been of help to you: 1. Marketing of milk 2. Provision of inputs 3. Procurement of cows. 4. Provision of Vet services. 5. Extension services. 6. Feed and concentrates. 7. Provision of AI service. 8. Provision of credit 9. Improvement in milk quality 10. Provision of training

11. Other specify
.....

56. Are there any changes since you have been marketing your milk through a cooperatives?

1. Production level 2. Income 3. Other specify
.....

57. do you think being a members of a cooperatives is some advantageous than being on your own?

1. Yes 2. No

58. Please explain why?
.....
.....

59. As a member of dairy cooperatives have you gained any new information?

1. Related to access to technology 1. Yes 2. No

2. Related to price and marketing 1. Yes 2. No

3. Related to production, milk handling and good farm management practice. 1. Yes 2. No

60. Do you believe that the dairy cooperatives are doing a good job in solving the problems that dairy farmers are facing these days? 1. Yes 2. No

61. If not what are the major commonly felt problems that are not being solved by the cooperatives in your area?

- 1. lack of adequate milk collection centre in near to my home
- 2. Lack of adequate dairy inputs for members
- 3. Lack of access to necessary service
- 4. Lack of chilling facilities to preserve milk
- 5. Lack of support by government and other stakeholders
- 6. High transaction costs
- 7. Other specify

Governance of cooperatives

62. Are you satisfied with cooperative leadership? 1. Yes 2. No

Please explain

63. Are leaders elected through voting of members? 1. Yes 2. No

64. Are you satisfied with the way elections are held? 1. Yes 2. No

Please explain

65. The leaders transparent and accountable especially in utilization of funds? 1. Yes 2. No

Please explain

66. Are you satisfied with the member's participation in decision making? . Yes 2. No

If not why?

67. What are the main problems cooperatives are faced with?

Problems	Very important	Important	Least important

68. Do you wish to remain a cooperative member? Yes 2. No

69. Why/ why not?

APPLICABLE TO ALL FARMERS

L. Constraints in dairy production and marketing

70. What are the major milk production and marketing constraints you have observed

	Production constraint	✓	Marketing constraint	✓
1	Lack grazing land		Distance of milk collection centers from my home	
2	Inadequate water supply		Lack of access to adequate market	
3	Inadequate feed		In adequacy of labor to transport milk	
4	Prevalence of disease		Spoilage of milk during transportation	
5	Dairy cattle procurement		In adequate market information	
6	Poor veterinary service		In adequate infrastructural development	

	Other			
--	-------	--	--	--

71. What are your suggestion on improving dairy production and marketing activities?

	Improving production	Improving marketing
1		
2		
3		
4		
5		
6		