MEKELLE UNIVERSITY

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DETERMINANTS OF PARTICIPATION IN MILK MARKETING OF SMALL HOLDERS IN JIJIGA WOREDA, ETHIOPIA

By;
Abdi Mahamoud Abdi

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Advisor;
Dr. G.B. Pillai (Professor)

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Declaration

This is to certify that this thesis entitled "Determinants of participation in milk marketing of smallholders in Jijiga Woreda, Ethiopia," submitted in partial fulfillment of the requirements for the award of the degree of M.A, in Cooperative Marketing to the School of Graduate Studies, Mekelle University, through the Department of Cooperative studies, done by Mr. Abdi Mahamoud Abdi, Id No.CDANR/PR0011/01**,** is genuine work carried out by him under my guidance. The matter embodied in this project work has not been submitted earlier for award of any Degree or Diploma to the best of my knowledge and belief.

Abdi Mahamoud Abdi	_____	_____
Name of the Student	Signature	Date
Prof. G. B. Pillai	_____	_____
Name of the supervisor	Signature	Date

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List of Abbreviations

AIDS= Acquired immune Deficiency Syndrome

AMUL= Anand Milk Union Ltd

CMM= Camel Milk Marketing

CSA= Central Statistics Authority

DDA= Dairy Development Agency

DDE= Dairy Development Enterprise

FAO= Food and Agricultural Organization

EEA= Ethiopian Economic Association

FCA= Federal Cooperative Agency

GDP= Gross Domestic Product

HIV= Human Immune virus

ILCA= International Livestock Center For Africa

ILRI=International Livestock Research Institute

IPMS= Improving Productivity and Market Success.

JZOA=Jijiga Zone Office of Agriculture

NGOs= Non-governmental organizations

RPOs= Rural Producer Organizations

PAs= Peasant Associations

SORPARI= Somali Region Agro-pastoral Research institute

SSA= Sub-Saharan Africa

TB= Tuber culosis

UAE= United Arab Emirates

UNDP= United Nations Development Program

UNICEF= United Nation Children Fund

UNO= United Nations Organization

WHO= World Health Organization

Abstract

The study was carried out in Jijiga worada which was purposively selected from the six woradas of Jijiga zone because of its resource potential in crop and livestock production.

For this study purpose, Multi-stage random sampling tool was used to select two milk routes and sample households out of five milk routes. In the first stage, simple random sampling technique was used to select two milk routes. In the second stage, 120 household heads were selected from the villages along the milk routes by using probability proportionate size (PPS) by 8%.

Both primary and secondary data were collected for the purpose of this study. The primary data were collected at household level from people involved in fluid milk marketing. Secondary data were collected from internet, reports, books, journals, articles, and working papers.

For the purpose of this study, both quantitative and qualitative data were collected. To generate data on social, institutional, and economic variables, structured interview schedule was employed. The interview schedule was administered with the help of enumerators. The enumerators were trained on methods of data collection and interview techniques.

For the analysis of the collected data, statistical software known as $SPSS_{-15}$ was used to compute the data and the analyzed data were presented in tables and bar chart.

According to the analysis, to address the first objective, the level of participation in marketing was measured by developing a participation index having two components such as, involvement with the required activities in milk marketing and increased sales volume of milk.

To attain the second objective, which is to identify factors influencing participation in milk marketing, 16 determinant factors were analyzed by using Pearson's coefficient of correlation.

To address the third objective, ranking technique was used for the given suggestions that respondent considered them as they will contribute to the improvement of smallholders' participation in milk marketing.

CHAPTER I

INTRODUCTION

1.1. Background

Ethiopia's poverty-stricken economy is based on agriculture, accounting for half of GDP, 90% of exports, and 80% of total employment (CSA, 2007). The sector is essentially composed of smallholders, as 63% of the farmers cultivate less than 1 hectare, and 87% less than 2 hectares (Ethiopian Economic Association 2004/5). Subsistence agriculture accounts for the most part as it is estimated that roughly 30% of agricultural production is marketed. Over the past decade, the Federal government of Ethiopia has taken important steps in promoting cooperatives (a form of RPOs) as a means to connect smallholders to markets.

In Ethiopia the livestock sub-sector is estimated to contribute about 12-16% of the total GDP and 30-35% of total agricultural GDP and 60-70% livelihoods of the Ethiopia population. The major Livestock population in Ethiopia is estimated to be 39,714, 653 cattle, 14, 326, 206 sheep and 11,155, 218 goat. Of these resources, 20% of cattle and 25% of sheep are found in the lowland pastoral areas of the country. The estimated annual growth rates are 1.2% for cattle, 1% for sheep and 0.5% for goats (CSA, 2007).

The major species used for milk production in Ethiopia are cattle, camel and goats. Cattle produce 83% of the total milk and 97 % of the cow milk comes from indigenous cattle breeds. The total population of animals used for milk production is 13,632,161 TLU. Although milk production is increasing by 1.2% per annum, the demand-supply variance for fresh milk is ever widening and the per capita consumption is diminishing.

The key development issues in dairy are low milk production complicated by widespread food insecurity, growing gap between supply and demand in urban areas, and low average milk productivity (Adina and Elsabet, 2006).

Four major systems of milk production can be distinguished in Ethiopia, these are: Pastoralist, Highland Smallholder, Urban and pre-urban (small and medium dairy farms in backyards in and around towns and cities), and Intensive dairy farming. Even though, information on both absolute numbers and distribution vary, it is estimated that about 30% of the livestock population are found in the pastoral areas. The pastoralist livestock production system which supports an estimated 10% of the human population covers 50-60% of the total area mostly lying at altitudes ranging from below 1500 m.a.s.l. Pastoralist is the major system of milk production in the low land. However, because of the rainfall pattern and related reasons shortage of feed availability milk production is low and highly seasonally dependent (Aklilu, 2004).

The majority of milking cows are indigenous animals which have low production performance with the average age at first calving is 53 months and average calving intervals is 25 months. Cows had three to four calves before leaving the herd at 11-13 years of age, the average cow lactation yield is 524 litres for 239 days of which 238 litres is off take for human use while 286 litres is suckled by the calf. But also a very small number of crossbred animals are milked to provide the family with fresh milk, butter and cheese. Surpluses are sold, usually by women, who use the regular cash income to buy household necessities or to save for festival occasions. Both the pastoralist and smallholder farmers produce 98% of the country milk production. The remaining 2% of the total milk production of the country are produced by urban, pre-urban and intensive dairy farmers (Aklilu, et.al, 2002).

The total value of the export of livestock and livestock products has been increasing over time. During the last ten years, the total value increased from Birr 408 million (47 million USD) in 1997 to over one billion (121 million USD) in 2006.

The trend of the export value of livestock has shown a rise during the last four years. The livestock sector ranks second to coffee in generating foreign exchange with the average official share of about 14 percent in the value of total export over the period 1985/86 – 2005/06 (NBE data base).

In 2002, the Federal Cooperatives Commission of Ethiopia was created to organize and promote cooperatives at the national level. As of today, its ambitious five year development plan (2005-2010) aims at providing cooperative services to 70% of the population by 2010, increasing the share of the cooperative input marketing up to 90%, and increasing the share in cooperative output marketing to 60%. It also targets to establish 500 new unions (from 100 at present), six federations and a cooperative league. Services in areas ranging from management training, to market information and HIV aids prevention should also be provided, along with the recruitment of several thousand cooperative managers. Finally, the federal cooperative commission aims to increase women participation from 13 to 30%, and youth participation from almost none to 25% by 2010(FDRE, 2002).
Indeed, to assess the general effect of cooperatives in Ethiopia, one must understand *where* the cooperatives are most likely to be present, and *who* participates to such institutions.

Increasing participation in agricultural markets is a key factor to lifting rural households out of poverty in Africa countries (e.g., Delgado 1995). Markets represent a channel for sectoral and macro economic policies that aim to improve welfare of peasants households. Stimulating participation of subsistence farmers into market will help them to benefit from these economic opportunities and is relevant to achieve food security and poverty alleviation. Yet the economic literature on market participation, while growing in scope and depth, continues to be relatively thin (Bellemare and Barret 2006).

Small-scale milk producers face many hidden costs that make it difficult for them to gain access to markets and productive assets (Staal et al., 1997). The relatively high marketing costs for fluid milk in Africa, the scattered nature of fluid milk markets and the

risk attached to marketing of perishables in the tropics suggest that transaction costs play a central role in dairy production and marketing. Under such conditions collective action as in producer marketing cooperatives, milk traders groups etc. that effectively reduce transaction costs may enhance market participation. Hence, it is vital to know what governments can do to better support these organizations and their emergence, and determine which alternative institutions should be encouraged.

Transaction costs are the embodiment barriers to market participation by resource-poor small-holders. They include the costs of searching for the partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (and officials) to reach an agreement to see that its conditions are fulfilled, and enforcing the exchange agreement (Holloway et al , 2000). Collective action is widely recognized as a positive force for rural development in Africa. Groups enable individuals to empower themselves and to increase benefits from market transactions.

Getting together with others also can allow individuals to better cope with risks, particularly when neither the private sector nor the government provides any "safety nets" or insurance against risk (Place *et al*, 2002)

These milk groups allows them to share information, encourage one another in the business, build trust with the producers, reduce the transaction costs of monitoring, and can easily be reached by the regulators. They sometimes share contracts with sellers and buyers when there is more demand or supply. They also teach those new to the business how to manage it. Producers build trust with them such that one trader can not default payment of a farmer's milk or cheat on them e.g. claiming that the milk got spoiled or never sold it. This is because the traders do the business together and monitor each other.

Given the importance of collective action in informal milk marketing, the major objective of this study is to determine what influences smallholders milk-groups' participation in collective action, the impact of collective action on market participation by milk-group and identify the role of governments, policies and other complementary institutional

arrangements for enhancing the effectiveness and viability of institutions for collective informal milk marketing.

1.2. Statement of the problem

The Livestock sector plays a vital role in the economics of many developing countries. It provides food, or more specifically animal protein in human diets, income, employment and possibly foreign exchange. For low income producers, livestock also serve as a store of wealth; provide draught power and organic manure for crop production as well as a means of transport. Consumption of livestock products in the developing countries, though starting from a low base, is growing rapidly. This indicates the existence of a wide gap between the potential demand of the growing population of Ethiopia and supply of milk and milk products. In order to meet the growing demand in Ethiopia, milk production has to grow at least at a rate of 4% per annum (Azage 2003).

Given the considerable potential for smallholder income and employment generation from high-value dairy products (Staal and Shapiro 1996), the development of the dairy sector in Ethiopia can contribute significantly to household income, poverty alleviation and nutrition in the country.

The livestock subsector in Ethiopia is less productive in general, and compared to its potential, the direct contribution to the national economy is limited. The poor genetic potential of productive traits, in combination with the substandard feeding, healthcare and management practices that animals are exposed to are the main contributors to the low productivity (Zegeye 2003). Low rainfall, high temperature and low forage production, common plant association, livestock and human carrying capacity, incidence of important livestock diseases and parasites, mainly define the lowlands. In the past, most of the interventions to develop the dairy sector focused more on increasing production, specially in the so-called high potential areas and with less attention to input supply and marketing systems and government engagements focused on input supply oriented services aimed at

tackling problems restricting increases in milk production, with little attention to the development of appropriate milk marketing and processing systems.

In general, the development of improved marketing system is pivotal to increase production (Tsehay 2002). Enhancing the ability of poor smallholder farmers to reach markets and actively engage in them is one of the most pressing development challenges. Remoteness results in reduced farm-gate prices, returns to labour and capital, and increased input and transaction costs. This, in turn, reduces incentives to participate in economic transactions and results in The major constraint to increasing the welfare of smallholders is their inability to participate in subsistence rather than market-oriented production systems. Sparsely populated rural areas, and high transport costs are physical barriers to accessing markets; lack of negotiating skills, lack of collective organizations and lack of market information are other impediments to market access.

Both the formal and informal dairy marketing systems in SSA are allegedly inefficient. The former is charged with the exploitative practices of the large-scale parastatal organizations while the informal market is allegedly inefficient because of redundant activities by the numerous middlemen in the dairy trade. These allegations have not been adequately studied, hence the merits and demerits of the alternative dairy marketing systems remain unclear.

Collective action is widely recognized as a positive force for rural development in Africa. Groups enable individuals to empower themselves and to increase benefits from market transactions. Getting together with others also can allow individuals to better cope with risks, particularly when neither the private sector nor the government provides any "safety nets" or insurance against risk (Place, *et al*, 2002).

The objective demand of this study is to address the determinants of participation of smallholders in milk marketing Jijiga District; what influences participation of the smallholders in milk marketing, the importance of participation for smallholders in milk marketing, and the constraints and institutional arrangements for enhancing the effectiveness of viable milk marketing institutions in the future.

1.3. Research questions

1. How is the current level of participation of smallholders in milk marketing?
2. What are the factors that influence the participation of smallholders in milk marketing?
3. What are benefits gained by smallholders through participation in milk marketing?
4. How participation in milk marketing can be improved?

1.4. Objectives of the study

General Objective

- To study the determinants of participation in milk marketing of smallholders in Jijiga worada, Ethiopia.

Specific Objectives

- To assess level of participation of smallholders in milk marketing.
- To identify factors influencing participation in milk marketing.
- To develop strategic solutions for smallholders' participation in milk marketing.

1.5. Hypothesis of the study

For the purpose of this study the following hypotheses are established:

- Infrastructure and socio-economic factors have no influence on the participation of smallholders in milk marketing.
- There is no benefits gained by smallholders participation in milk marketing.

1.6. Significance of the study

The result of this study is expected to be useful for the government policy makers, investors engaged in the sector, donors, NGOs, producers and marketing firms for their decisions. The study had tried to identify some important and policy relevant variables in smallholders' participation and supplies by smallholders in milk marketing.

The government and donors can promote their efforts influencing these variables at the desired level of proportion, so as to improve the smallholders participation in milk marketing and volume of dairy product supplies in the market. This will contribute to the overall regional and national efforts aimed at poverty reduction and food security and subsequently fostering development in the country's strategy framework of agricultural development led-industrialization. Moreover, it can be used as a reference document, especially, by those interested in milk marketing in the district.

1.7. Scope and limitations of the study

This study was conducted only in Jijiga Woreda of Somali regional state, one of the 52 woredas of the region. Therefore, the result and data obtained through this study can not be generalized to other woredas of the region because their socio-economic conditions may be different.

In addition to this scope, the study was limited due to financial constraint, inaccessibility to get statistical software which could ease the work and lack of published cooperative books.

CHAPTER II

LITERATURE REVIEW

2.1. Concepts

Market: It may be defined as a particular group of people, an institution, and mechanism for facilitating exchange. The market concept has also been linked to the degree of Communication among buyers and sellers and the degree of substitutability among goods (John and Shahran, 1998).

Marketing: Is the performance of all business activities involved in the flow of goods and services from the point of initial production until they are in the hands of ultimate consumers.

Marketing System: Is a collection of channels, middlemen, and business activities, which facilitate the physical distribution and economic exchange of goods and services (Kohls and Uhl, 1985**).**

Cooperative Marketing: is an extension of the principles of cooperation in the field of marketing. It is a process of marketing through a cooperative association formed voluntarily by its members to perform one or more marketing functions in respect of their product.

Farmers' group: is an informal voluntary and self governing association of small farmers formed at local level for the purpose of economic co-operation aimed at improving the economic and social conditions of its affiliated individual members (FAO, 1999).

Milk-marketing group: can be defined as a group of smallholder farmers who individually produce at least one litre of saleable milk and are willing to form a group with the objective of collectively processing and marketing milk (Tsehay,1998),
Milk-route: is a road that links villages within the same area for the purpose of collecting milk.

Marketing channel: The marketing channel is a trade or distribution network and it is defined by Stern et al. (1996) as sets of interdependent organizations involved in the process of making the product or service available for consumption. The channel follows a vertical structure where products flow from producer to the ultimate consumer and in which actors meet at each market. Different marketers exist in channel arrangements to perform marketing functions that contribute to the product flow. Actors acting between producers and final users are known as intermediaries.

Transaction costs: Are the costs of arranging a contract ex ante and monitoring and enforcing it ex post (Matthews, 1986). More generally, they are the costs of running the economic system (Arrow, 1969) or figuratively, the economic equivalent of friction in physical systems (Williamson, 1985). They include the costs of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (and officials) to reach an agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled and enforcing the exchange agreement (Holloway et al., 2002). Transaction cost measured in terms of opportunity cost of labour involved and cost of holding inventory during search for market information and trading partner (Gebremedhin, 2001).

The structure of the market or industry: refers to the characteristics of the organization of the market that seem to exercise strategic influence on the nature of competition and pricing within the market. Scarborough and Kydd (1992) and Magrath(1992).

2.1.1. Concept of Participation

French (1960) referred participation as a process in which two or more parties influence each other in making certain plans, policies, and decisions.

According to Davis (1969) participation is a mental and emotional involvement of a person in a group situation which encourages him to contribute to goals and shares responsibilities in them.

According to UNO (1979) participation means sharing by people the benefits of development, active contribution by people to development and involvement of people in decision making at all levels of society.

WHO (1982) defined participation as the process by which individuals, families or communities assume responsibility for their own health, welfare and develop the capacity to contribute to their own and community development.

According to UNDP (1993) participation refers to the close involvement of people in the economic, social cultural and political process that affect their lives. People may, in some cases, have complete and direct control over these processes- in other cases; the control may be partial or indirect. The important thing is that people have constant access to decision making and power.

The involvement of people in activities through participatory approach is in the scenes such as: (1) participation in decision making; (2) participation in implementation of programmes and projects; (3) participation in monitoring and evaluation; and (4) participation in sharing the benefits of development (Mishara, 1984).

Clark (1991) identified the elements essential for securing active participation of farmers' groups such as: (1) small homogenous group; (2) supplementary income generation activities; (3) institutional credit; (4) group promoters; (5) training to group members; (6) group savings; (7) ready access to extension service; (8) participatory monitoring and

evaluation; and (9) group self reliance. He also observed the indicators of self-reliance of farmers' groups as (1) regulatory of group meetings and level of attendance; (2) shared leadership and member participation in group decision making; (3) continuous growth in group savings; (4) high rates of loans repayment; (5) group problem solving; and (6) effective link with extension and other development services.

2.1.1.1 Market participation

Various definitions of market participation have been suggested. Latt and Nieuwvoudt (1988) refer to market participation as commercialization. They consider it as any market activity which promotes the sale of a produce. Market participation can also be described as an individual's or household's economic transactions with others, be it cash or kind (Von Braun et al., 1991). Staal et al. (1997) mention that a low proportion of products exchanged in the market reflects limited market participation. With the three possible states of buying, selling or not trading, Goetz (1992) defines market participation using household purchases and sales. Quantities bought or sold are used to determine market participation. Goetz (1992) studied the participation of Senegalese agricultural households in grain markets, using a probit model of households' discrete decision to participate in the market (either as buyers or sellers, without distinction) followed by a second-stage switching regression model of the continuous extent of market participation decision (i.e., transaction volume).

In an agricultural market economy, market participation or commercialization is mainly when farmers stop being mostly subsistence farmers and become commercial. Market participation is then defined as earnings from market activities (Makhura *et al.*, 1997; Makhura, 2001).

Market participation: is highly for likely households owning cows. In this sense, livestock ownership is the relevant discrete market participation decision.(Heckman's,1979)

For this study, market participation is operationalized by two determinant dimensions, that is, the level of smallholder's involvement in the activities of milk marketing and sales volume.

2.2. Empirical studies

2.2.1. Overview of dairy production systems in Ethiopia

As defined by Sere and Steinfield (1995), livestock production systems are considered a subset of the farming systems, including cases in which livestock contribute more than 10% to total farm output in value terms or where intermediate contributions such as animal traction or manure represent more than 10% of the total value of purchased inputs. There are different classification criteria for livestock production systems in general and dairy production systems in particular. For example, based on criteria such as integration with crops, relation to land, agro-ecological zones, intensity of production and type of product, the world livestock production systems are classified into 11 systems (Sere and Steinfield 1995). Of these livestock production systems, mixed farm rain fed temperate and tropical highlands (MRT system) is by far the largest. Globally, it represents 41% of the arable land, 21% of the cattle population, and 37% of dairy cattle (Sere and Steinfield 1995).

Dairying is practiced almost all over Ethiopia involving a vast number of small or medium or large-sized, subsistence or market-oriented farms. Based on climate, land holdings and integration with crop production as criterion, dairy production systems are recognized in Ethiopia; namely the rural dairy system which is part of the subsistence farming system and includes pastoralists, agro-pastoralists, and mixed crop–livestock producers; the peri-urban; and urban dairy systems (Azage and Alemu 1998; Ketema 2000; Tsehay 2001; Yoseph et al. 2003; Zegeye 2003; Dereje et al. 2005). The first system (pastoralism, agropastoralism and highland mixed smallholder production system) contributes to 98%,while the peri-urban and urban dairy farms produce only 2% of the total milk production of the country (Ketema 2000).

The rural system is non-market oriented and most of the milk produced in this system is retained for home consumption. The level of milk surplus is determined by the demand for milk by the household and its neighbours, the potential to produce milk in terms of herd size and production season, and access to a nearby market. The surplus is mainly processed using traditional technologies and the processed milk products such as butter, ghee, *ayib* and sour milk are usually marketed through the informal market after the households satisfy their needs (Tsehay 2001). Pastoralists raise about 30% of the indigenous livestock population which serve as the major milk production system for an estimated 10% of the country's human population living in the lowland areas. Milk production in this system is characterized by low yield and seasonal availability (Zegeye 2003).

The highland smallholder milk production is found in the central part of Ethiopia where dairying is nearly always part of the subsistence, smallholder mixed crop and livestock farming. Local animals raised in this system generally have low performance with average age at first calving of 53 months, average calving intervals of 25 months and average lactation yield of 524 litres (Zegeye 2003).

Peri-urban milk production is developed in areas where the population density is high and agricultural land is shrinking due to urbanization around big cities like Addis Ababa. It possesses animal types ranging from 50% crosses to high grade Friesian in small to medium-sized farms. The peri-urban milk system includes smallholder and commercial dairy farmers in the proximity of Addis Ababa and other regional towns. This sector owns most of the country's improved dairy stock (Tsehay 2001). The main source of feed is both home produced or purchased hay; and the primary objective is to get additional cash income from milk sale. This production system is now expanding in the highlands among mixed crop–livestock farmers, such as those found in Selale and Holetta, and serves as the major milk supplier to the urban market (Gebre Wold et al. 2000).

Urban dairy farming is a system involving highly specialized, state or businessmen owned farms, which are mainly concentrated in major cities of the country. They have no access to grazing land. Currently, a number of smallholder and commercial dairy farms are emerging mainly in the urban and peri-urban areas of the capital (Felleke and Geda 2001; Azage 2003) and most regional towns and districts (Ike 2002; Nigussie 2006). Smallholder rural dairy farms are also increasing in number in areas where there is market access. According to Azage and Alemu (1998), the urban milk system in Addis Ababa consists of 5167 small, medium and large dairy farms producing 34.65 million litres of milk annually. Of the total urban milk production, 73% is sold, 10% is left for household consumption, 9.4% goes to calves and 7.6% is processed into butter and *ayib* (cheese). In terms of marketing, 71% of the producers sell milk directly to consumers (Tsehay 2001).

2.2.2. Traditional milk handling and processing practices in Ethiopia

Cows are the main source of milk, and it is cows' milk that is the focus of processing in Ethiopia (Layne et al. 1990). Dairy processing in Ethiopia is generally based on *ergo* (fermented milk in Ethiopia), without any defined starter culture, with natural starter culture. Raw milk is either kept at ambient temperature or kept in a warm place to ferment prior to processing (Mogessie 2002).

Dairy processing in the country is basically limited to smallholder level and hygienic qualities of products are generally poor (Zelalem and Faye 2006). According to Zelalem and Faye (2006), about 52% of smallholder producers and 58% of large-scale producers used common towel to clean the udder or they did not at all. Above all they do not use clean water to clean the udder and other milk utensils. Of the interviewed small-scale producers, 45% did not treat milk before consumption, and organoleptic properties of dairy products are the commonly used quality tests.

In a study conducted in the Borena region of Ethiopia, butter was found to be an important source of energy as food for humans, and is used for cooking and as a cosmetic. The storage stability of butter, while not comparable to ghee, is still in the order

of four to six weeks. This gives butter a distinct advantage over fresh milk in terms of more temporal flexibility for household use and marketing (Layne et al. 1990).

Traditional milk technologies have evolved produce butter, whey and cottage cheese. However, traditional processing technologies are generally considered to be time consuming and inefficient in terms of milk fat recovery, product quality, a comparatively short shelf life and provide little return for the milk producer. Milk producers should follow hygienic practices during milking and handling before delivery to consumers or processors or for collection. Possible sources of post harvest losses are scale of contamination affected by temperature and storage time, adulteration, lack of proper handling, transportation and distribution, low level of technology used to process milk to an acceptable standard and the lack of fresh milk outlets.

The traditional smallholder dairy system makes up the largest part of the dairy production system and can be characterized by its low input, feeding and management requirement and use of indigenous genotypes. The improved dairy production system could be classified into small scale production systems, and commercial private urban and peri-urban production. The characteristics of the improved dairy production systems vary substantially in terms of intensification, management systems, genotypes used, type and methods of marketing and processing of milk and dairy products. At present this sector is expanding rapidly through intensification and expansion of smallholder milk production.

2.2.3. Dairy marketing systems in Ethiopia

In the African context, markets for agricultural products would normally refer to market places (open spaces where commodities are traded). Conceptually, however, a market can be visualized as a process in which ownership of goods is transferred from sellers to buyers who may be final consumers or intermediaries. Therefore, markets involve sales, locations, sellers, buyers and transactions (Debrah and Berhanu 1991).

2.2.4. Formal vs. informal dairy marketing

The term 'informal' is often used to describe marketing systems in which governments do not intervene substantially in marketing. Such marketing systems are also referred to as parallel markets. The term 'formal' is thus used to describe government (official) marketing systems (Debrah 1990). Dependable system has not been developed to market milk and milk products in Ethiopia (Zegeye 2003). Fresh milk is distributed through the informal and formal marketing systems. In both rural and urban parts of the country, milk is distributed from producers through the informal (traditional) means. This informal market involves direct delivery of fresh milk by producers to consumers in the immediate neighborhood or to any interested individuals in nearby towns (Debrah and Berhanu1991).

Initial intervention to promote formal dairy marketing started with the establishment of a 300 dairy farm and a small milk processing plant under the UN Relief and Rehabilitation Program in 1947 in the premises of the now Dairy Development Enterprise (DDE) (Sintayehu 2003). The same report stated that in 1959 UNICEF helped establish a processing plant with a processing capacity of 10 thousand liters per day with milk collection and purchasing centers around Addis Ababa. The radius of milk collection was later expanded to 70 km around the capital. Capacity of the processing plant was increased to 30 thousand litres in 1969. In 1979 the DDA (Dairy Development Agency) was transformed to the DDE when processing capacity was increased to 60 thousand litres/day and the radius of collection expanded to 150 km with donor assistance.

The only organized and formal milk marketing and distribution system comes from the two milk-processing plants which are both located in the capital Addis Ababa (Zegeye 2003). As reported by many authors, farmers' milk marketing groups and dairy cooperatives play a key role for milk marketing outlets, which as a result encourages farmers to produce more (Zegeye 2003).

The informal milk marketing system dominates the supply of milk and dairy products to consumers in Ethiopia . A strategy for inclusion of the informal sector in dairy sub-sector

development is vital for its sustainable development. The strategy to be employed includes organization of the stakeholders in production and marketing by stratification of the country into the different dairy production system and introduction of appropriate technologies to increase the efficiency of the dairy sector through reduction of post harvest losses and improvement of quality.

2.2.5. Role of farmers' milk marketing groups

According to Tsehay (1998), a milk-marketing group can be defined as a group of smallholder farmers who individually produce at least one litre of saleable milk and are willing to form a group with the objective of collectively processing and marketing milk

To facilitate milk marketing by smallholders with crossbred cows, SDDP catalysed the formation of producer 'milk groups' (also called 'milk units' or 'mini-dairies') to process milk into butter, local cottage-type cheese (*ayib*), and yoghurt-like sour milk (*ergo*), primarily in the northern Shewa zone, north of Addis Ababa. Two similar producer groups were formed south of Assela (Arsi zone) with assistance from the Ministry of Agriculture, and another group was formed in Bakelo near Debre Birhan. This last site is in the Amhara region, whereas the other four are in the Oromia region (Nicholson et al. 1998).

2.2.6. Role of dairy cooperatives in facilitating marketing

According to the international cooperative alliance, a cooperative is an association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically manage the same (ICA, 1995). The Ethiopian cooperative establishment proclamation No.147/98 defines that "a cooperative is a society established by individuals on voluntary basis to collectively solve their economic and social problems and democratically managed". It is a body organize to ensure self help through mutual help, it is an association of persons who have joined together to fulfill individual needs in a democratic decision making organization in which all members participate and have a proportion of gain and losses

The final goal of all cooperatives activity is to free men and women from social and economic burdens by enabling them to work for and through their fellow beings to uplift their social economic status. It is to make men with a sense of both individual and joint responsibility so that they rise individually, to a full personal life and collectively to a full social life. Cooperative is a useful tool for promotion or enhancing economic development. The cooperative movement plays an important role in establishing economic structures, making people aware of improvements and also utilizes improved techniques.

The greatest asset of the movement of the economic development is great, mobilization power. Cooperative appeal to the self-interest of the masses in a way they can understand, and demonstrate with tangible results, that most of the economic problems facing a community can be solved by making use of the locally available resources and that people working together in a spirit of mutual help can improve the economic position no matter how hopeless and helpless it may seem. Cooperative philosophy enunciates those virtues that guide cooperative practices everywhere. It is an epitome of volunteers, cooperation, self-help, mutual, self-respect and social responsibility. The aim being, self improvement through group efforts. Cooperatives have been organized around almost every aspect of economic activity. Among which includes milk marketing cooperatives.

Berhane and Workneh (2003), in their review, indicated the very useful involvement of the government of India at every step of the development for expansion of dairy cooperatives in the country for the successes of dairying and suggested that the Anand pattern of dairy development (India) can be emulated at least around the major milk sheds in Ethiopia, for instance around Nazareth, Dire Dawa, Harar, Bahir Dar, Gondar, Awassa (one of the present study areas), Jimma and Assela. As demonstrated in India, dairy marketing cooperatives could provide farmers with continuous milk outlets, and easy access to essential inputs such as artificial insemination (AI), veterinary services and formulated feeds.

Dairy cooperatives are supposed to help to trigger a series of positive developments in the subsector; hence strengthening the existing group marketing activities and formation of new cooperatives in different parts of the country (Berhane and Workneh 2003).

.The history of the dairy cooperative system in India began in 1946 with the establishment of the Anand Milk Union Ltd (AMUL). In 1970, Operation Flood commenced with the objective of establishing a cooperative structure on the Anand pattern(Matthewman1993). In 1980, some 12 thousand village cooperative milk producers' societies had been established in 27 selected milk shed districts. This was expanded by 1984 to 28,174 village producers in 155 milk shed districts linked to markets in 147 towns. The case of Uganda (followed the same milk collection schemes through cooperatives with this regard) is also a good example from east Africa (Matthewman 1993). Cooperative selling institutions are potential catalysts for mitigating costs, stimulate smallholders' entry into the market, and promote growth in rural communities (Holloway et al. 2000). Case studies from Kenya and Ethiopia illustrate the role of dairy cooperatives in reducing transaction costs (Staal et al. 1997). A good example to be mentioned in Ethiopia is Ada'a-Liben *Woreda* Dairy Association (Azage 2003) which presently renders milk to processing plants in Addis Ababa.

Though Ethiopia has the potential and opportunities to start milk cooperatives, farmers have not yet risen to the occasion. The development of milk cooperatives in the Oromia region with one Dairy Union is worth mentioning. The milk cooperatives are collecting and marketing the milk from farmers. The Cooperatives are trying to supply cattle feed to the farmers. They face the problem of marketing during the fasting months. They need to go a long way in procurement of milk on quality and quantity basis, processing of milk in to milk products like powder, butter, cheese, ghee, standardized and pasteurized milk, and marketing the same in their own outlets.(G.Veerakumaran, 2007)

Effective functioning of milk cooperatives is possible in Ethiopia if we adopt the structure of successful Anand Model of India: The emergence of user groups such as the Addis Abeba Dairy producers Cooperative, Adaa Liben Milk Marketing Cooperative and

Selale Milk Marketing Union and a number of small scale milk processing groups paved the way to rationalize milk marketing where proper marketing in terms of milk collection, transportation, processing and distribution are the means to enhance production.

2.2.7. Camel milk marketing

The camel (Camelus dromedaries) is an important livestock species uniquely adapted to hot arid environments. It is most numerous in the arid areas of Africa, particularly in the arid lowlands of Eastern Africa namely, Ethiopia, Somalia, Sudan, Kenya and Djibouti. Approximately 11.5 million animals in this region represent over 80% of the African and two thirds of the world's camel population (Schwartz 1992).. With increasing human population pressure and declining per capita production of food in Africa, there is an urgent need to develop previously marginal resources, such as the semi-arid and arid rangelands, and to optimize their utilization through appropriate livestock production systems of which camel production is certainly the most suitable one (Schwartz 1992).

The major ethnic groups owning camels in Ethiopia are the Beja, Rashaida, Afar, Somali and Borana (Workneh 2002). However, despite its significant contribution to the livelihood of the pastoralist society who does have little alternative mode of production system, up until recently the camel is one of the neglected domestic livestock by scientific community in Ethiopia (Yesihak and Bekele 2003).

Despite all its ecological advantages, the camel will continue to loose importance, unless solutions are found for turning camel breeding into an activity profitable enough to sustain livelihoods. The camel represents something of an orphan commodity that neither animal scientists and veterinarians nor wildlife conservationists feel responsible for.

This situation has to change. Furthermore, the stigma that has come to be associated with camel breeding as a backward activity has to be removed. Unless young people perceive camel breeding as a livelihood option that generates a certain minimum income, there is no way that the camel can be saved, except in a zoo (Kohler-Rollefson 2004).

The one-humped camel (Camelus dromedarius) is the most precious asset to Somali pastoralists, as it represents the vital 'technology' that allows the production of food in these environments by converting browse forage into quality and nutritious products. The economic potential of camels in arid and semi-arid lands is increasingly being recognized, together with their comparative advantages when compared to cattle and small ruminants in terms of their adaptability to harsh climatic conditions (Han Jianlin 2004).

The camel shows outstanding features when compared to other dairy animals. A camel's lactating period is longer than that of cows; milk is produced even under dry conditions and to some extent it preserves its qualities under harsh climatic extremes, thus providing options for transport and processing in dry-land environments. The nutritional value of camel milk is widely acknowledged. Compared to cow milk it has higher protein, and lactose levels, and is richer in minerals and in vitamins (especially A, B and C complexes), while fat content is lower in camel milk, thus reducing cholesterol levels (Wernery, 2003). Risks from TB and Brucella are lower.

The camel’s milk is a rich source of proteins with potential antimicrobial and protective activities; these proteins are not found in cow’s milk or found only in minor amount, moreover camel’s milk is used in some parts of the world as a cure for certain diseases (Wernery, 2003).

As a consequence, camel milk is especially used in the diets of children, sick and elderly persons. Increasingly, therapeutic properties of Camel milk are also recognized.
It has been proven to boost the immune system against infections and allergies and provide relief to some diseases such as peptic ulcers and skin cancers. Its use in hospitals in some Arab countries (e.g., UAE) also addresses TB and HIV/AIDS, related problems.

Due to its specific features, camel milk traditionally represents the staple food of Somali pastoral households and is a nutritional supplement for the increasing urban population.

Its income generation role is quite recent as it was usually exchanged as a gift to establish and maintain family ties and social support mechanisms.

Recently, Camel Milk Marketing (CMM) is a developing women's enterprise aimed at ensuring food security, generating some income and providing a buffer to cope with critical situations. It is an entirely private enterprise revolving around a trust system (money is paid after milk is sold) and operating without any formal institutional frame. CMM relies upon networks of people and organizations (the marketing agents) that create complex relationships and engage in a variety of socio-economic activities. These milk marketing networks materialize in specific 'corridors' through which commodities, services, information and people are flowing in combined but contrasting directions so as to satisfy the needs of both pastoral and urban communities.

A case study in the Ogaden-traditionally a food insecure area in the Somali region shows that the sale of livestock milk products generates more than 80 percent of the income needed to satisfy basic needs among pastoral households in dry periods, while it contributes about 40 percent during the rainy season, when milk is in surplus (Abdi Abdullahi Hussein 1999 on Michael, et.al 2006).

2.2.8. Common challenges of dairy production and marketing in Ethiopia

Challenges and problems for dairying vary from one production system to another and/or from one location to another. The structure and performance of livestock and its products marketing both for domestic consumption and for export is generally perceived poor in Ethiopia. Underdevelopment and lack of market-oriented production, lack of adequate information on livestock resources, inadequate permanent trade routes and other facilities like feeds, water, holding grounds, lack or non-provision of transport, ineffectiveness and inadequate infrastructural and institutional set-ups, prevalence of diseases, illegal trade and inadequate market information (internal and external) are generally mentioned as some of the major reasons for the poor performance of this sector (Belachew 1998; Belachew and Jemberu 2003; Yacob as cited in Ayele et al. 2003).

In the debate of poverty reduction or small-scale vs. industrial production and in spite of a general consensus on the appropriateness of general recommendations, there seem to be a lack of vision regarding the future structure and roles of the present small-scale producers. Many donors seem ready to protect and preserve the smallholders, but few have a vision of the process requiring 'transforming small-scale subsistence producers into commercial producers supplying a modern, demanding food market' (Kristensen etal. 2004). According to the same report, small-scale farmers can be empowered through:

- Promoting farmer cooperative organization, provision of training etc.
- Developing infrastructure, roads, markets etc
- Providing incentives and promoting vertical integration with supply and processing and marketing sectors
- Improving access to information and to agricultural and veterinary services
- Promoting participatory methods in research and technology development
- Supporting pro-poor research and advisory services that are smallholder oriented.

In order to have such recommendations, therefore, knowledge of the specific characteristics' of smallholders' dairy producer groups and market participation is vital to be able to target recommendations of the specified target area of study. Therefore, the researcher believes that findings of this study will enable to call for strategic interventions, to improve the better performance and participation of smallholders in milk marketing and effective risk management through enhancing their business skills.

2.2.8.1. Traditional Coping Mechanisms of challenges

Somali culture is based on the concept of mutual support, and has a variety of traditional mechanisms through which those in need can be helped, either within the extended family or by the society in general(Birch and Halima, 2001). Sadaqa encourages the giving of alms, while Hersi refers to the collection of milk from families in one rer or

homestead to be given to travelers or to those who have lost their livestock. Zakaat is a mandatory tax of a 2.5 percent that every Muslim is supposed to pay annually to the poor.

Ethiopian pastoral communities are often more mutually supportive, especially within clans, than their agrarian counterparts. Where it is difficult to find access to shared resources, households may resort to credit, mostly from relatives or merchants. The coping strategy practiced in these areas is sedentarization. Many people no longer have enough livestock holdings to sustain a purely pastoral subsistence. If once drought and disease are disseminated, it took long time to recover. Thus, livestock income is supplemented with vegetable and cereal production by using small-scale irrigation along the banks of Dawa and Genale rivers and rain fed farming in the case of Jijiga Worada.

Adaptations and risk avoidance are possible through maintaining mixed herds containing different animal species, being mobile and developing other forms of income to supplement herding such as farming, woodcutting and trade. This is because pastoralists are substantially depending on livestock and market for their food security. The economic dependence on livestock has important consequences for household food security of pastoralists. Livestock give households the flexibility to move away from problems of all sorts, which contributes to household food security (Devereux and Maxwell, 2001). Livestock mobility is not only a response to variable natural resource availability but also a response to changing market opportunities for livestock and its by-products, particularly, milk marketing.

More importantly, diversification of incomes remains a very important strategy to supplement incomes from livestock and substitute when herds have been decimated. Pastoralists have always had such auxiliary incomes, from woodcutting and charcoal making, trade, sale of labor, craftwork and so on. Formal interventions to encourage alternative incomes have tended to be unsuccessful (Scoones, 1995) whether irrigated agriculture, fishing or craftwork. Thus, there are clearly limits to how far outsiders can identify promising areas for supporting alternative forms of income generation to improve the household food security status of pastoral households.

2.2.9. Access to formal credit facilities by smallholders

During the past 40 years African governments and donors have set up credit programs aimed at improving rural households' access to credit. However, the vast majority of these credit programs especially the so-called 'agricultural development banks' which provide credit with subsidized interest rates, have failed to achieve their objectives to serve the rural poor and to be sustainable credit institutions. In response to these failures, innovative credit delivery systems are being promoted as a more efficient way of improving rural households' access to formal credit with no or minimal government involvements. Most of these lending are group based. They use joint liability and peer pressure as collateral substitutes and community based credit delivery systems to reduce transaction costs Abdil-Khalil Idris (2003).

According to Scoones, 1995; Devereux and Maxwell, 2001, food- insecure households, both herders and farmers, are normally short of cash to buy inputs in the market. They need access to adequate credit, but the fact is that institutional credit is not available to them. Extending credit to smallholders can be a most effective way to promote food production and household food security. Herders and smallholders have difficulties in gaining access to microfinance services. The rural poor, living in remote areas and often illiterate, have trouble in understanding complicated lending formalities.

Eligibility requirements such as collateral or guarantees, have further excluded the pastoralist from traditional banking institutions. Moreover, people like Zeller, et. al, (1997) substantiated this argument in such a way that, the poor have little or no collateral to offer and the credit demand is so small.

Savings, credit amounts and installments are small which raises per unit transaction costs. In addition, in the case of poor people credit needs for production and consumption can not be clearly distinguished. Thus the spheres of production and consumption are intertwined and inseparable. Given the vulnerability of the poor, risk aversion and related insurance behavior play important roles in the credit demand of the food insecure and poor households.

Covariate risks such as droughts, flood, and seasonal and individual household crises are central problems of the poor. A better understanding of existing informal institutions at the household and community levels could provide the key to designing sustainable rural financial systems that serve the food security of the poor. On the other hand, traditional credit institutions complain that small value loans to the poor rural people have high costs. And the repayment rates are often poor, which has further eroded their interest in undertaking such loans which supposed to provide food security (Arora and Alamgir, 1991). Because of this, the rural poor have been forced to resort to exploitative, informal sources of credit. The cost of such credit is very high and it is usually used for emergency or consumption needs, marriages, etc rather than for productive investment.

The ability of a country to sustain development is determined to a large extent by the capacity of its people and institutions to fully appreciate and efficiently manage complex environment, land tenure and other development issues. This requires technological, scientific, managerial, and institutional capacities. Knowledge and skills at the individual and institutional levels are necessary for policy analysis, institutional building, and efficient management. There is need to expand training programs and strengthen institutional capacity in pastoral areas. This will require a participatory strategy involving the public and private sectors, NGOs and local communities at all levels. The Government is expected to support all the developmental endeavors.

Support to local institutional and organizational development need to be emphasized in order to mobilize human and social capital. The key strategy here is in encouraging the development of human and social capital through the development of community groups and associations; business development groups e.g. Pastoral livestock and milk marketing cooperatives that could benefit from credit facilities and the procurement of livestock production inputs. These groups may also promote savings culture of pastoral communities for capital investment.

By saving as a group, the poor can accumulate a larger amount of money more quickly by pooling their savings in a common fund which can then be used by the group or a member of the group for productive investment. They can help each other learn these skills. As a group, they can more easily receive literacy and money management training from group promoters or trainers from NGOs, and also learn from other more literate members.

2.3. Market Participation by Smallholders, milk-groups and Dairy Cooperatives

Field surveys have shown that many potential liquid milk-marketing households are hours distant away from any milk group. Setting up new groups would clearly reduce the travel time to group, and the actual number of households that would benefit depends on local population densities. It is also important to keep newly emerging milk groups small and geographically limited to ensure proximity and avoid large groups that would tend to increase average travel times (Holloway et al., 2000). Another study showed that the creation of new market outlet for fluid milk brought major improvements in the production, marketing and consumption behaviour of smallholder households. The new marketing outlet may also promote involvement in more intensive dairying (Nicholson et al., 2000).

Co-operatives, by providing bulking and bargaining services, increase outlet market access and help farmers avoid the hazard of being encumbered with a perishable product with no rural demand (Jaffee, 1994). In short, participatory co-operatives are very helpful in overcoming access barriers to assets, information, services, and the markets within which small-holders wish to produce high-value items (Jaffee, 1994).

Like contract farming, producer co-operatives can offer processors/marketers the advantage of an assured supply of the commodity at known intervals at a fixed price and a controlled quality (Delgado, 1999). They can also provide the option of making

collateralized loans to farmers. The schemes also provides better relations with local communities than large scale farms, avoiding the expense and risk of investing in such enterprises, sharing production risk with the farmer, and helping ensure that farmers provide produce of a consistent quality (Delgado, 1999).

Dairy development along the cooperative lines was considered to be the most effective strategy for helping the rural poor without altering the village social structure and providing guaranteed market for milk at fixed prices, supply of cattle feed at a reasonable cost and efficient veterinary and extension services (Bavikar, 1988).

These are self-organized groups, which involve women who have milking cows and/or camels. They are locally called "Somaal' which means owners of milking animals. The number of women that participate in Milk marketing in Jijiga ranges from 2 to 5 per group. Members are organized on the basis of selling whole fresh cow and/or camel milk. In milk marketing group, members contribute an agreed amount of milk on a weekly basis and this is allocated to an individual woman on a shift basis. The woman sells the milk and the daily income belongs to her. The cycle continues until every member gets her share of the milk income.

Women's access to and control of income has increased their social and economic autonomy as well as enhanced their participation in decision-making. Pastoralist Somali women for example can influence migratory routes by pressuring men to locate camping sites near a small town, water source or a trading centre, in order to maximize returns from their milk and milk products. Additionally, they take part in management decisions related to improving milk output. They may use some of their income to purchase supplementary feed for the livestock, and remain responsible for milking and hence directly able to determine the level of milk off-take (Michael, 1990).

The links between gender and participation in milk marketing activities are quite significant in this context. While women groups' relationships constitute the backbone of the network, male-managed transport facilities in the milk-routes represent the

cornerstone of the system. In some cases milk car owners seem to take over the major functions and responsibilities from women groups as the system grows or as particular conditions of hardship developed. However, the collection of milk at one site by milk group is the driving force that put car owners to involve in the system

In pastoral community, butter tends to be made only when there is a surplus of milk from household requirements. This is more often during the wet season when more grazing and thus milk is available. Production is also constrained by the availability of female labour and so it depends on the ability of households to migrate seasonally in mass to the wet season pastures. Similarly Somali women in Jijiga, Babile and other small towns sell cow and camel milk in group to consumers. Milk is highly perishable, and yoghurt goes sour after several days. If there are no buyers then women have no choice but to give unsold stocks to their families before they spoil (IIRR 2004 on Andrew, Getachew and Fiona 2007).

2.4. Conceptual framework of variables selected for the study

In this study, 16 independent variables and one dependent variable were selected to prove the hypotheses set for this study hoping that they will address the objectives and they are presented as follows in the figure.

Figure1: Conceptual Framework

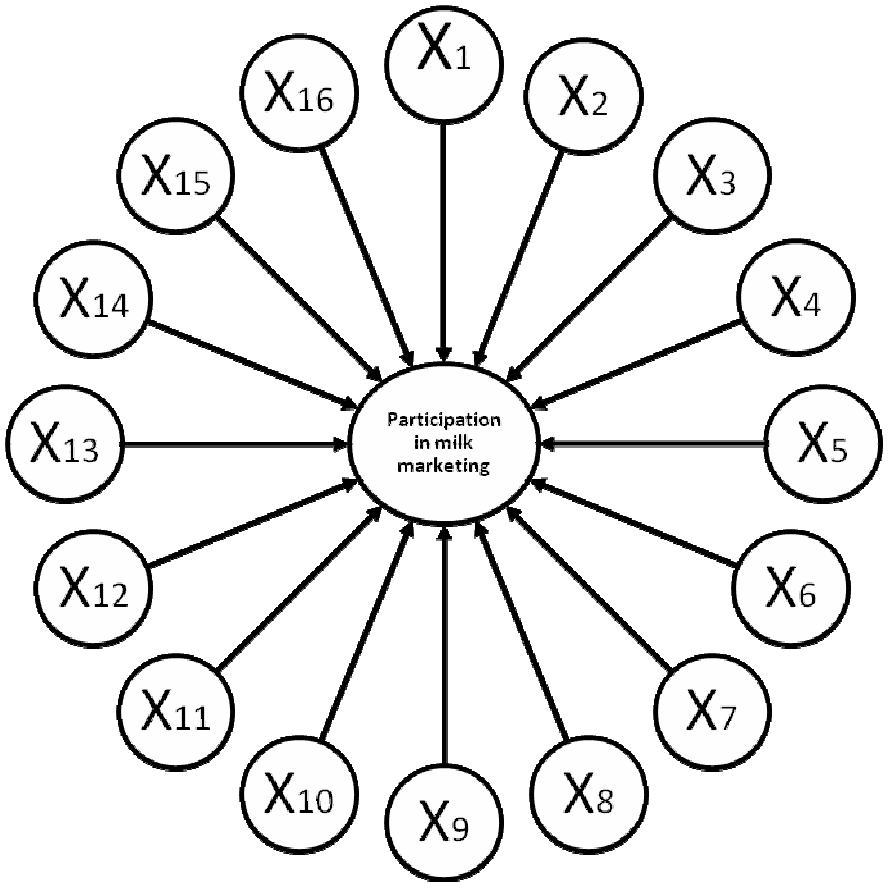


Table 2.1: Description of the selected variables

NO.	*VARIABLES*	*CODE*	*TYPE*
	Dependent		
1	*Participation in milk marketing*	Y	continuous
	Independent		
1	Age of the household head	(X_1)	Continuous
2	Sex of the household head	(X_2)	Discrete
3	Family size	(X_3)	continuous
4	Education of household head	(X_4)	Continuous
5	Experience in dairying	(X5)	continuous
6	Number of children in school	(X_6)	Continuous
7	Grain production	(X_7)	Continuous
8	Amount of loan received	(X_8)	continuous
9	Dairy production	(X_9)	continuous
10	Distance to market	(X_{10})	continuous
11	Distance to district capital	(X_{11})	continuous
12	Small stock ownership	(X12)	continuous
13	Income from non-dairy source	(X13)	continuous
14	Membership in milk-group	(X14)	Discrete
15	Exposure to extension services	(X15)	Continuous
16	Access to marketing information	(X16)	Discrete

CHAPTER III

MATERIALS AND METHODS

3.1. Description of the study area

Jijiga Woreda is one of the six woredas in the Jijiga zone. It is a part of Wabisheble basin. Its altitude range from 1600 to 1700 m.a.s.l. and it receives an annual rainfall that varies from 500 to 600 mm. According to CSA 2007/08, the population of the Jijiga woreda is 276,816 (125,584 urban and 151,232 rural). The mean monthly minimum temperature varies from 5.8^0 in November to 14^0 in July to September and mean monthly maximum temperature varies from 25^0 in July to 29^0c in March to April. Frost hazard exists above 1400m elevations from October to January and causes considerable crop damage above 1800m. The area experience bimodal type of rainfall classified as small and main rain seasons, the short rain season usually occurs from July to September and the main rain season occurs from March to April (JZOA, 2001).

The population in Jijiga is mainly from Somali tribe, Muslim in religion and of agro-pastoralists. Concerning household size, a rural household has an average size of 6 while the urban one has 5.3. The average household size for the Jijiga is 5.9, less than the average of the Somali region, which is 6.7 (JZOA, 2001). Mixed agriculture is well known and practiced by the farmers in Jijiga. Basically, Sorghum, maize, barely, wheat and bean are most important agricultural crops in Jijiga and they are staple food of rural community. Bean is mostly inter-cropped with sorghum. Some farmers plant ‘chat’ as cash crop. Members of the household and relatives mostly form the labour force. The average yield of sorghum and maize is estimated at 8 quintals per ha and 10 quintals per ha respectively (Eshetu and Teriessa, 2000).

Farmers in Jijiga woreda own ruminants, scavenging poultry and donkeys. Male small ruminants (billys and rams) are sold where as milk from does and ewes are used for children and additive for tea. Cows milk is used for household and the surplus is sold or converted to butter. Bulls are used for draught power or sold. Camels and donkeys are used as draught.

The gender division of labor in Jijiga woreda revealed that women's daily tasks include food preparation, child care, small business, handicraft, hut building and maintenance, house cleaning, fetching water and fuel wood. Weekly tasks for women involved washing clothes, ceremonial meetings, procurement of manure, and seasonal extraction of ghee in the rainy season. Man's activities included 'being household head', land preparation, searching for lost animals, burying the dead and traditional healing. Joint activities included weeding and harvesting crops, milking animals, building and dismantling huts and slaughtering animals (Fetenu, 1997).

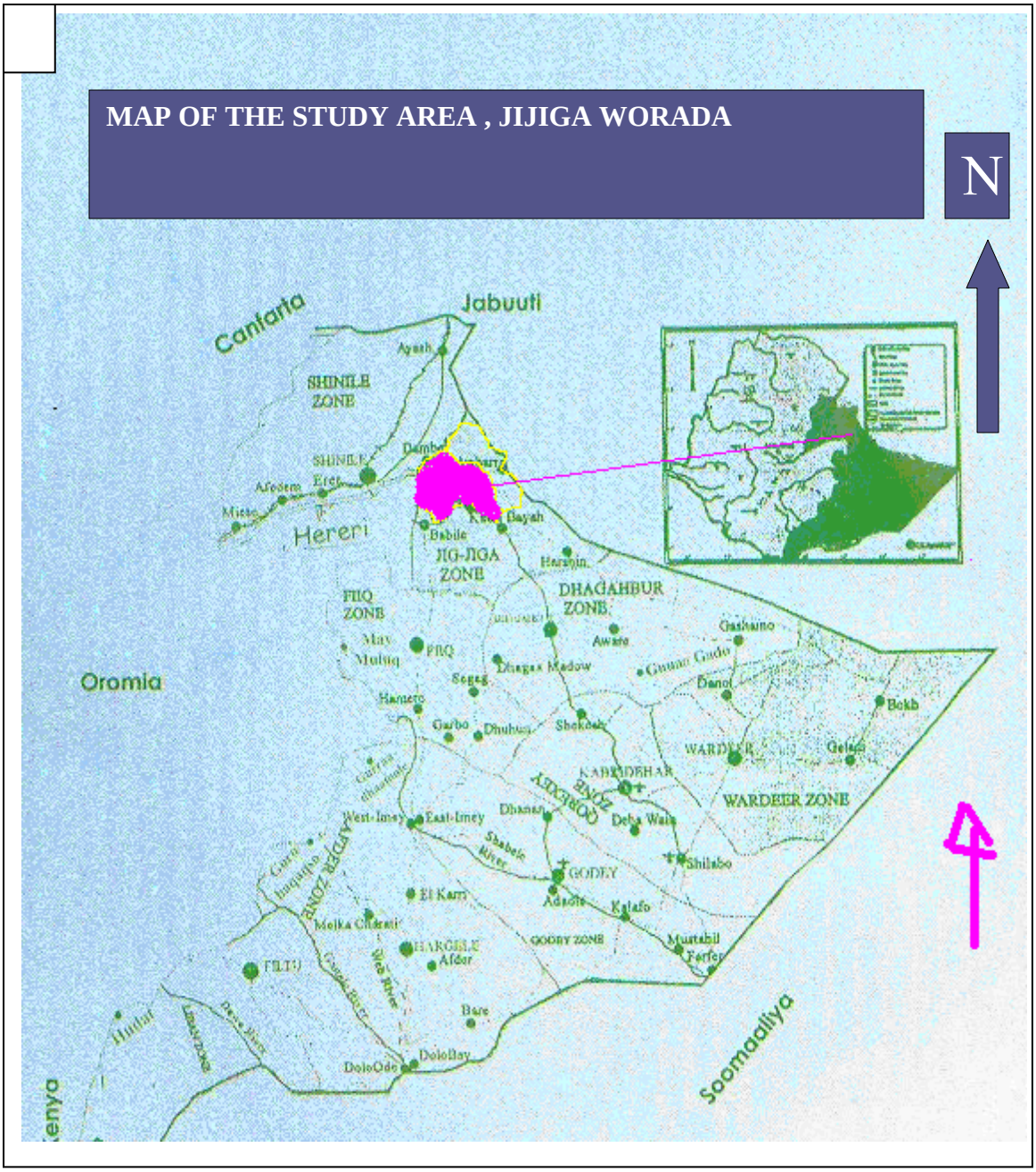


Fig-2: Map of the study area(Source : SORPARI)

3.2. Sampling methods and sampling frame

Jijiga district is purposively selected from the six woradas of Jijiga zone. The criteria for selecting Jijiga district is purely based on its resource potential both crop and livestock production, which is mainly undertaken by smallholder farmers. Moreover, due to the growing urbanization and infrastructural development in the area, there are new initiatives of marketing systems developed informally, particularity, in the dairy sub-sector such as informal milk-groups in the rural and peri-urban commercial milk farms and limitation of logistics on the part of the researcher to go beyond Jijiga are some of the reasons given attention to study the area.

For this study purpose, Multi-stage random sampling was used to selected two milk routes and sample households out of five milk routes.

- In the first stage, simple random sampling technique was used to select two milk routes.
- In the second stage, 120 household heads were selected from the villages along the milk routes by using probability proportionate size (PPS) by 8%.
- Two Focus group discussions were held during the survey; the first group being a group consisting of a total of 12 persons which includes private milk traders, milk-group sale agents, milk-route car drivers, kebele leaders, community elders, by using a checklist, and the second group being a group consisting of 10 key informants from regional and worada agriculture and rural development bureaus', regional and worada cooperative promotion agency promoters, custom authority, subject matter specialists and other concerned bodies to draw data relating the study.

For the selected respondents, the following sampling frame was developed in the process of selection from villages along the two routes:

Table 3.1: Distribution of sample respondents in the villages of the two routes

S/N	Village	Population size	Sample size
1	Hadaw	250	20
2	Aroaska	300	24
3	Goloajo	350	28
4	Qabri Ahmed	185	15
5	Gunburka	215	17
6	Yoosle	200	16
	Total	**1500**	**120**

Source: Jijiga Worada Administrative Council, 2008

3.3. Data type and sources

Both primary and secondary data were collected for the purpose of this study. The primary data were collected at household level from people involved in fluid milk marketing. Primary data were collected from the sampled respondents on different issues such as household characteristics, household resource, transaction costs, and distance to market and all other variables hypothesized as they influence smallholders'participation in milk marketing in Jijiga worada of Somali region, and from focus group discussions. Secondary data were collected from internet, reports, books, journals, articles, and working papers.

3.4. Data collection methods and tools

For the purpose of this study, both quantitative and qualitative data were collected. To generate data on social, institutional, and economic variables, structured interview schedule was employed. The interview schedule was administered with the help of enumerators. The enumerators were trained on methods of data collection and interview techniques. To generate qualitative data, focus group discussions with officials and key informants and discussion with male and female headed households were conducted. Field trips were made before the actual survey to observe the overall features of the study area and pre-tested the interview schedule with 24 household heads. It was done by using non sample respondents.

3.5. Methods of data analysis

All the quantitative and qualitative data collected were computed into computer by using statistical software known as $SPSS_{-15}$.

According to the analysis, to address the first objective, simple descriptive statistics was used to measure the amount of milk supplied by the sampled households. To attain the second objective, which is to identify factors influencing participation in milk marketing, Pearson' coefficient of correlation.

3.6. Definitions of variables

The variables used in the analysis were operationalized as follows:

Dependent Variable:

Participation in milk marketing: In this study, the dependent variable "participation in milk marketing" is operationalised in two dimensions, that is, the involvement in the required activities in milk marketing such as milking, collecting, packing, transporting, handling , supplying, etc and increased sales volume of milk.

Independent variables:

The following independent variables are hypothesized to influence the participation in milk marketing of smallholders.

Age of the household head: Age is a continous independent variable operationalised as the number of years the respondent has completed at the time of interview. Age may have important role in the production process and plan alternative source of income for the family. Household head has the capacity to decide all rights against his property; therefore, age is hypothesized to positively influence the milk marketing participation.

Sex of the household head: sex is dichotomous variable of being either male or female. In mixed farming system, both men and women take part in livestock management. Culturally women are responsible to drive income from processing and marketing dairy products, therefore, it is postulated to have a positive effect on milk marketing participation.

Family size: Family size is a continuous independent variable to the number of members in the family including children, adults and dependent. measured in terms of adult equivalent (Strock, 1991) was included in the model as a variable explaining variation in market participation. Families with more household members tend to have more labour. Production in general and marketable surplus in particular is a function of labour. Thus, family size is expected to have positive impact on market participation but larger family size requires larger amounts for consumption, reducing marketable surplus.

Education of the household head: It will be measured in terms of formal years of school ship in primary school, secondary school and others. The educational level of the individual is one of the important factors preparing the individual to receive and utilize new information to be more productive. It is assumed that the level of education of the household head will positively affect the participation in milk marketing.

Experience in dairying: This variable is measured in terms of the number of years of experience in dairying of the household head; it is expected to have a positive effect on marketing participation and sales volume.

Number of children in school: Households who have students in school besides the reduced labor required for different activities incurs additional cost in the form of school fees, better clothing and for the purchase of different materials as learning aids for the students. These households are, therefore, expected to participate in milk marketing because of increasing financial obligation.

Grain production: is measured by the number of quintals of grain produced by the household in the last harvest In subsistence smallholder farming, production of grain is mostly meant for household consumption. Grain is sold when it is only surplus or beyond the consumption need of the household. On the other hand, when the household is deficit in grain production, it must either borrow or buy through money secured from different sources. Families who are deficit in grain production are likely to participate in the milk marketing and allocate much of the income for the purchase of grain. High protein dairy

products are often sold to buy high energy grains at favourable terms of trade (Kerven, 1987; Grandin, 1988). Livestock keepers also exchange high value commodities like meat and milk for cheaper and larger quantities of food, such as cereals (Bouisand Haddad,1990).

Amount of loan received: is measured by the amount of money indebted in birr for last one year. Amount of loan received has similar impact as financial income from different sources in improving marketing participation decision and sales volume of the farm households. Dairy income is continuous so families may not face problem in loan repayment.

Dairy production: is the number of litres of milk produced by the respondent per day. The variable is expected to have a positive contribution in marketing participation of smallholder farmers. A marginal increase in dairy production has obvious and significant effect in motivating marketing participation. Production beyond consumption has two phases based on various reasons; either sold as fluid milk or processed into different dairy derivatives. The processed part of the product may be used for home consumption or sales. Production in turn varies directly with the number of crossbred and other lactating dairy cows. Adoption of technology, such as crossbred dairy cows, improves the milk yield, through increased milk yield per lactation, increased lactation length, yield per day and short dry period. Some field studies have shown that the policy relevant variables having the greatest impact on farmer participation in liquid milk markets are cow numbers, the number of cows kept affects marketable surplus through both total production and the marginal costs of production (Holloway et al., 2000).

Distance to market: is the distance from the home of the respondents to the nearest milk market in kilo meter. The closer the market ,the lesser would be the transportation charges, reduced transaction costs, reduced trekking time, reduced loss due to spoilage, and reduced other marketing costs, better access to market information and facilities. This improves return to labor and capital and increase farm gate price and the incentives to participate in economic transaction.

Distance to district capital: is the distance in kilo meter from home of the respondents up to district capital. Most of dairy production is found in rural areas while the demand and profitable market is found in the district capital. The closer the urban centre, the lesser would be transaction and marketing costs. Distance to urban centers is a proxy to transactions cost which may negatively affect participation and sales volume decision of dairy products. Small scale dairy producers face many hidden cost that make it difficult for them to gain access to markets and among the barriers are transactions cost (Staal et al., 1997).

Small stock ownership: It refers to number of sheep and goats that the household owns. Livestock are good sources of cash to be used for purchasing agricultural inputs and hence it is expected to positively affect the farmers' participation in milk marketing.

Income from non-dairy Sources: is the amount of money earned from non-dairy sources in birr. These are originating from off farm activities and different forms of remittances obtained by household head, spouse and other household members. Through improving liquidity, this income makes the household more able to expand production and/or purchase from market. It also strengthens the household position in coping with different forms of risks and e economic transactions.

Membership in milk-group: is operationalized to be one of those persons who contribute milk for the purpose of marketing and thereby benefited from on turn basis. Membership in a milk-group enables the farmer to obtain services provided by the group such as transport facility and input supplies. Therefore, it is believed to contribute to the participation of farmers in milk marketing.

Exposure to extension services: is operationalized by the number of contacts made with the extension agent for the last one year. The exposure to extension services enhances the producers' skills in production .and is expected to increase production which enables to engage in marketing.

Access to marketing information: refers getting the required and useful information about the price and other conditions related to milk marketing. Information is the driving force of marketing activities. Therefore, to be well informed about milk marketing ahead of time is expected to have its own impact on participation in milk marketing.

CHAPTER IV

RESULTS AND DISCUSSION

In this chapter, the results of field survey are discussed and details of the findings are presented so as to address the three objectives set for this study.

4.1. Participation in marketing

The participation in marketing was measured by developing a participation index of having two components such as, involvement with the required activities in milk marketing and increased sales volume of milk.

Therefore; the level of participation in milk marketing was measured by giving weightage of the two components as illustrated in table:4.1.

Table 4.1. Level of participation in milk marketing.

No	Description of components	Relative level of participation in milk marketing						Score	Rank
		High (3)		Medium (2)		Low (1)			
		frequency	%	frequency	%	frequency	%		
1	Involvement with required activities in milk marketing	81	67.5	28	23.3	11	9.2	310	1
2	Increased sales volume of milk	5	4	32	26	84	70	163	2

Source: computed from survey data 2010.

As revealed in table 4.1. the level of participation of the first component was found that 81(67.5%) of the respondents were highly involved, 28(23.3%) of the respondents were in medium involvement and 11(9.2%) of the respondents were in low level of involvement with a corresponding score of 310 which make it first in rank. This indicates that the level of participation in the involvement with required activities of milk marketing is high due to reasons of immediate cash needs for domestic consumptions. For example; to buy sugar and tea leaf is inevitable in the study area. Which means willingness, to participate is high because of extreme needs for income.

It is also indicated in table 4.1. the level of participation of the second component was found that 5(4%) of the respondents were in high sales volume category by supplying 10 litres and above, 32(23.3%) of respondents were in medium level of sales volume by supplying 2-9 litres of milk and 84(70%) of the respondents were grouped in low level of sales volume by supplying ½-1litres of milk with the corresponding score of 163 which makes it the second in ranking. As basic component of participation in milk marketing, it indicates that there is a low level of participation in the increased sales volume of milk due to reasons of poor performing local breeds, diminishing number of cattle due to frequent droughts and climate change effects, lack of effective extension service, lack of veterinary service delivery, traditional feeding system and absence nutritious fodder, population pressure and increasing urbanization are among reasons to mention.

To reconcile these two extreme levels of participation in milk marketing, the first component which shows high level of willingness and commitment for the involvement with required activities in milk marketing is resulted, to supply low level of sales volume in milk marketing. As a result of, which makes the total, low level of participation in milk marketing is existed in the study area.

4.2. Factors influencing the smallholders' participation in milk marketing.

In order to explain factors influencing smallholders' participation in milk marketing, both discrete and continuous independent variables were selected based on the economic theories and findings of different empirical studies

4.2.1. Description of Demographic characteristics of the Respondents

Demographic characteristics are variables which are related to personal characteristics such as age, sex, marital status, level of education, family size, and others. The distribution of sample respondents based on their demographic characteristics is presented in Table 4.1 below:

Table 4.2: Distribution of demographic characteristics' of respondents

Description		
Age of the household head	**Frequency**	**Percent**
19-60 yrs adult	113	94.2
61 yrs above old	7	5.8
Total	120	100.0
Sex of the household head		
Female	47	39.2
Male	73	60.8
Total	120	100.0
Education of the household head		
illiterate	95	79.2
read& write	20	16.7
primary school complete	5	4.2
Total	120	100.0
Family size		
1-3 members	53	44.2
4-6 members	55	45.8
7-9 members	10	8.3
10 members above	2	1.7
Total	120	100.0
Number of children in schooling		
1-2 children	5	4.2
no children for schooling	115	95.8
Total	120	100.0

Source: computed from survey data, 2010

4.2.1.1. Age of the household head

The age of the respondents interviewed in the study ranged from 19 to 73. The mean of the respondents age was 37.58 years with the standard deviation of 12.55. The respondents were grouped into two age categories. Majority (94.2%) of the respondents fall under working force category of age 19-60 years followed by older age group which are above 61 years (5.8%). This shows most of respondents can be actively involved in activities of participation of milk marketing. Because dairy production and marketing management are labour intensive, it needs to be capable of both physical and mentally.

4.2.1.2. Sex of the household head

The above Table 4.2. reveals that, 60.8 per cent of the respondents were male and 39.2% were female . In Somali society male is the traditional head of the family and women can take this responsibility in case of husband death or divorced. It is also normal for women to act as the head of the family in the absence of her husband or to respond when issues of domestic affairs are in place such as milk marketing. To this end, therefore; milk management and marketing are carried out by women even though most of the interviewed respondents were male heads. This was done for respect provided he is present in the village at the time of interview. Males are involved in the activities of milk marketing usually when herds are taken away from the principal residence of the family.

4.2.1.3. Level of education

Education is one of the important variables, which increases farmers' ability to acquire, process and use agricultural related information. Lack of access to education and high illiteracy rate are common phenomena of developing countries like Ethiopia. Somali region is one of the regions named by the world bank funded projects in Ethiopia as " access deficit regions". This is an indicator of poor access to intellectual-capital. In fact, educational level of farmers is assumed to increase their ability of participation in milk marketing activities in a better way.

As indicated in Table 4.2., (79.2%) of the sample respondents were categorized as illiterates, 16.7 % were fall under those who can able to read and write, and 4.2% were grouped as those who completed primary school education respectively. The higher illiteracy rate shows poor farmers ability to perceive new information or use technologies that improve productivity and quality of their produce, as a result of which decrease their participation of milk marketing.

4.2.1.4.Family size

The larger family size is assumed to increase the consumption of milk which has a negative impact on participation of milk marketing, particularly; if household members are small children. On the other hand, the larger family size has a positive contribution on participation of milk marketing because they contribute more labour on production and management. In the study area, larger family size has it own significance for migrating animals to where good pasture and water is available and involvement in milk marketing activities in terms of labour division, decision taking, planning and implementation. Therefore, In this study, family size was assumed to have positive relation to participation of milk marketing.

The respondents were placed in to four categories, as Table 4.1., reveals 1-3 members constitute 44.2% with 53 frequency rate, 4-6 members were 45.8% with a 55 frequency rate , 7-9 members were 8.3% of the total with 10 frequency rate and above 10 members constitute 1.7% of the total with 2 frequency.

4.2.1.5. Number of children in schooling

Family with many children in school is assumed to be incurred more cost for schools fees, purchase of schooling aid materials, better clothing and other related costs. As is revealed from table 4.2.1. the respondents were categorized into two, 1-2 children schooling households which constitute 4.2% with (5) frequency rate and no child accessed for schooling group constitute 95.8% (115). This shows that child schooling has

a less significance in the participation of milk marketing. Because poor access of education for children in the pastoral areas.

Table 4.3: Distribution of experience in dairying (N= 120)

Description	Frequency	Percent
0-2 yrs	13	10.8
3-5 yrs	15	12.5
6-9 yrs	25	20.8
10 yrs above	67	55.8
Total	120	100.0

Source: computed from survey data, 2010.

4.2.1.6. Experience in dairying

It is an important variable of intellectual capital measured by the number years the farmer engaged in activities of participation in milk marketing. As is stipulated in table 4.2. the respondents were categorized in to four groups, those who were engaged less than >2 years constitute 10.8% with a frequency of(13), 3-5 years experience were 12.5% (15) of the total, 6-9 years experience were 20.8% (25) and above 10 years experienced group were found 55.8% (67) of the total respondents. This shows that majority of respondents were traditionally experienced in dairying for a long period of time. This can be understood from the local name of current participants (Somaal) means milk producers. It is also the original route of the word "Somali" which is name of the nation.

However; their current participation in the activities of milk marketing depends on ownership of milking cows/camels and related domestic cash needs of the household. Therefore, in this study, experience in dairying have a positive relationship with participation of milk marketing.

4.2.1.7. Exposure to extension services

Exposure to extension service is an intellectual capital which enhances the producers' skills in dairy productivity and quality. Agricultural extension is an important service delivered by the government or NGOs. It is crucial for the development of livestock production and genetics improvement through (AI) service delivery.

However such kind of technical skills support for the pastoral community is not yet introduced in the study area on the part of the government. Despite individual persons had started their own initiatives of introducing exotic breeds of pure and cross breed cows and modern feeding system in the peri-urban area.

Table 4.4: Distribution of respondents based of their exposure to extension services (N=120)

Description	Frequency	Percent
Once a yr	102	85.0
Twice a yr	18	15.0
Total	120	100.0

Source: computed from survey data, 2010.

As depicted in table 4.4, the frequency of respondents exposed to extension services infers that 102(85.0%) were those who obtained the extension services once a year and those who obtained the services twice a year were 18(15.0%). Most of the service provided was animal vaccination given in form of campaign by the bureau of Agriculture and rural development. Extension service, therefore; was focused mostly with livestock health, especially, in prevention aspect. Marketing extension and production was not given the attention deserved. During the survey, pastoralists reported to the researcher prevalence of two diseases, an acute disease killing young camels and persistence side effect of cactus thorn, which is a ball like membrane with collection of thorn, blocking intestinal digestive system of the animal. The concerned bodies reported that the incidence has not yet found a solution. Moreover, the grazing land is deteriorated by infestation of congress weeds locally called " kaligii noole" which means the " solitary

living weed". This weed eradicates all species of the local grass and endanger the life cattle. The pastoralist households indicated that they were not getting enough and relevant extension services such as (AI) for improving poor performing local cows, animal health services, and improved feeding system. . This shows the gap of extension services delivery even though , it is important for enhancing participation of milk marketing

4.2.1.8. Access to marketing information

Access to marketing information is an intrinsic element of any marketing activities. Exchange of information is traditionally part of Somali culture, if two persons coming from different directions are met along the road, they do not pass each other unless they exchange information relating peace, good pasture and rain, and marketing situation of the nearby market. There is one old saying of Somali " there is no hunger than being eager to get information" which means hunger for information is more serious than hunger for food.

Table 4.5: Distribution of access to marketing information (N=120)

Attribute	Frequency	Percent
Access to marketing information		
Yes	104	86.7
No	16	13.3
Total	120	100

Source: computed from survey data, 2010.

As is stipulated in table:4.5.the findings against whether the respondents have access to market information was found that 104 (86.7%) replied "yes" we have access to marketing information and rest of them which is 16 (13.3%) of the total were demonstrated their no access to marketing information, to sell their products with confidence. With respect to source of information, most of the respondents replied during interview and open discussions that they usually get through milk group members, milk

car drivers and neighbour farmer who used go to town for other purposes. Those with no access to marketing information belonged to kebeles located around Shebelley valley which has physical barrier of access.

4.2.1.9. Grain production

In the subsistence smallholder farming, grain is mostly produced for consumption. However; households with surplus grain production use it as a cash crop to cover for immediate expense of household needs. Sometimes , this is done without surplus production of grain. For example, in the study area, the immediate cash needs includes watering expenses of livestocks. In such cases, items are sold without considering their relative importance or necessity for the household. Therefore; food insecure pastoral households participate in milk marketing activities because milk is the immediate source of income, and has a favourable terms of trade when exchanged with energy rich grain and sugar.

Table 4.6: Distribution of grain production (N=120).

Description	Frequency	Percent
1-21quintals	83	69.2
22-27 quintals	20	16.7
28-35 quintals	15	12.5
36 quintals above	2	1.7
Total	120	100.0

Source: computed from survey data, 2010.

As is revealed in table:4.6. the distribution of grain production of sample respondents were categorized into four, those who produce 1-22 quintals of grain constitute 83 (69.2%), 22-27 quintals, were 20 (16.7%), 28- 35 quintals were also 15 (12.5%) and those who produce above 36 quintals were 2 (1.7%) of the total. This shows that grain producing in the pastoral or agro-pastoral area is very poor. Because they prefer to

produce for forage purpose than grain. In the study area, the type of crop grown is mostly stalk crop such as maize and sorghum, which is purposively grown to get supplementary feed for animals in harsh time.

Therefore; a need of additional food items for home consumption is inevitable. This makes them to participate in the activities of milk marketing. On the hand, sale of dairy products mainly by smallholders in the rural areas, may be regarded as a symptom of increasing poverty.

4.2.1.10. Amount of loan received

Amount of loan received has similar effect as the other off farm income from different sources for improving involvement in the activities of milk marketing and sales volume of the smallholder. Even though; there is no any formal financial institution that provides credit facility in the study area.

Table 4.7: Distribution of amount of loan received(N=120).

Description	Frequency	Percent
0-1000 birr	91	75.8
1001-5000 birr	1	.8
no access to credit facility	28	23.3
Total	120	100.0

Source: computed from survey data, 2010.

As depicted in table 4.7, the distribution of respondents on loan receiving were grouped into three categories: those who received less than 1000birr,constitutes 91(75.8%), 1001-5000birr loan received group 1(.8%) and those with no access of credit facility 28(23.3%). This can be understood that no formal credit has been taken. But ,in the study area, people took loan from one another during farming for tractor expense or they used to take in the form of water consumption for human and animals from Birka owners in the dry season or from shop owners for domestic needs and social obligations. All these

indebtness initiated the pastoral household to participate in milk marketing. On the hand, if the loan is taken for investment on livestock production, it would ultimately promote participation of milk marketing.

4.2.1.11. Dairy production

A marginal increase in dairy production has obvious and significant effect on motivating of participation in milk marketing. Farm households participating in milk marketing allocate at least one litre of milk for sale everyday.

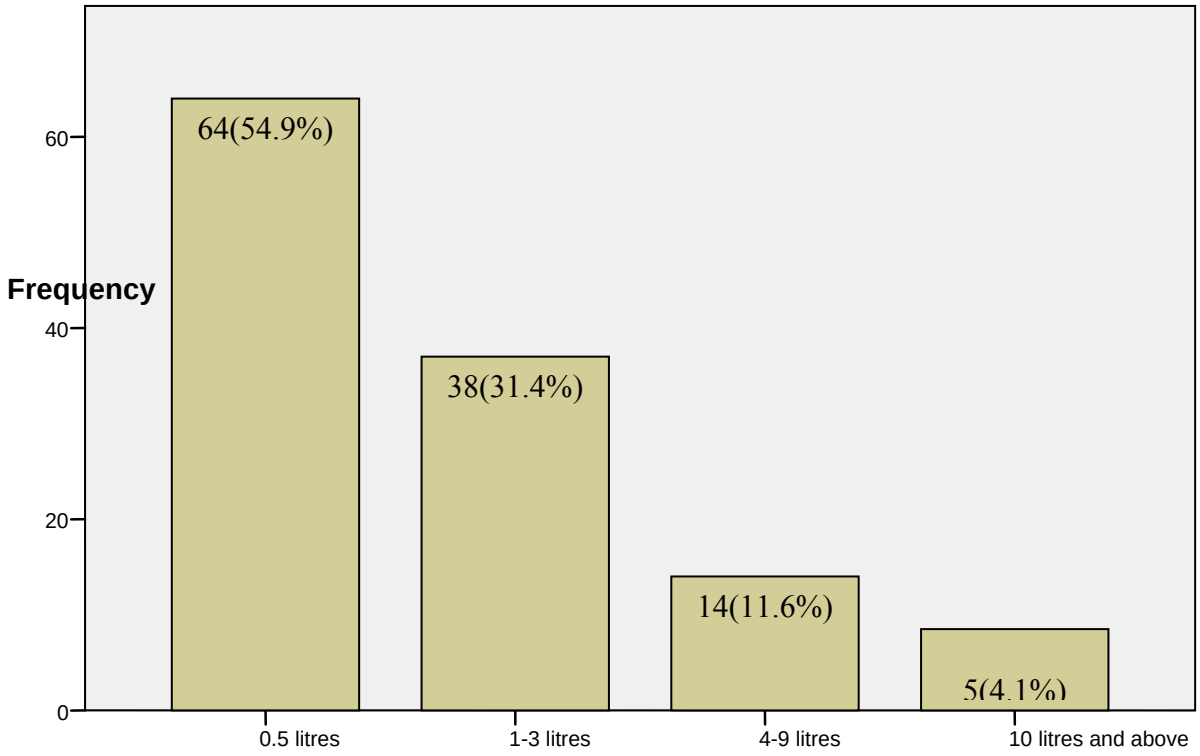
Table 4.8: Distribution of milk production (N=120)

Description	Frequency	Percent
1-4 litres	88	73.3
5-9 litres	22	18.3
10 litres above	10	8.3
Total	120	100.0

Source: computed from survey data 2010.

As indicated in table 4.8, producers of milk were grouped into three those who produce 1-4 litres, with a frequency number of 88 (73.3%), 5-9 litres with a frequency rate of 22(18.3%), and 10 liters above producers has frequency of 10(8.3%). This makes maximum producer 12 litres and minimum produce 3 litres and mean of production 4.70 litres, with standard deviation of 2.202. Because, all the dairy cows are indigenous breeds, which have low milk production performance. Most of the respondents interviewed indicated that low produce of milk forced them to be grouped into small milk marketing unit, when it comes to sell milk.

Figure 3: Sales volume of milk marketing (N=120)



Source: Milk collection centre

As presented in figure 3 above, the volume of milk supplied by the interviewed respondents was classified into four categories: those who used to supply half a litre per day constitutes 64(54.9%), those who used to supply 1-3 litres per day constitutes 38(31.4%), those who used to supply 4-9 litres per day constitutes 14(11.6), and those who used to supply 10 litres and above constitutes 5(4.1%). This shows that there is low production of milk on the part of smallholders which makes them to participate in milk marketing activities by contributing in groups.

4.2.1.12. Distance to market

The closer the market, less cost of transaction would be incurred, less time of travel. This may reduce losses due to spoilage and producers would have access to current market information. In the study area, the nearest market is the milk collection center which is locally called "gole"where the milk car collects the containers or jar cans. Therefore; the distance to this center is important.

Table 4.9: Distribution of distance to market (N=120)

Description	Frequency	Percent
0-1 km	104	86.7
2-4 km	16	13.3
Total	120	100.0

Source: computed survey data 2010.

As is indicated in table 4.9, majority of the respondents are found within 1km radius of the collection center, 104 (86.7%), and the rest of them were found 2-4km radius of the collection center, 16(13.3%). This shows that the milk car pick up milk for marketing at the doorsteps of producers except for Shebelley kebele which is not accessible for car.

4.2.1.13. Distance to district capital

Table 4.10: Distribution of distance to district capital

Description	Frequency	Percent
11-18km	31	25.8
19-24 km	59	49.2
25km above	30	25.0
Total	120	100.0

Source: computed from survey data, 2010.

As revealed in table 4.10, villages of the interviewed respondents grouped into three,11-18km away from district capital, 31(25.8%), 19-24km away from district capital, 59(49.2%), and 25km above 30(25.0%) away from district capital. This shows that most of the villages were not within the range of Jijiga town milk shed before the development current milk marketing system. It is believed that both distance to travel and time of return are reduced by the milk cars as a result of which, increased participation in milk marketing. But those who do not have milk cars, the distance to district capital has been negatively influencing their participation.

4.2.1.14. Smallstock ownership

This refers to the number of sheep and goat owned by the household. Livestock are good sources of cash to be used for purchasing agricultural inputs and to cover the immediate expenses of the household including watering and supplementary feed purchases of other animals. Therefore; it has a positive relation with the participation in the milk marketing activities.

Table 4.11: Distribution of shoats ownership (N=120)

Description	Frequency	Percent
<15 shoats	14	11.7
16-30 shoats	14	11.7
31-50 shoats	15	12.5
no shoats at all	77	64.2
Total	120	100.0

Source: computed from survey data, 2010.

As is shown in table 4.11, the shoats ownership status of respondents were classified into those who own less than 15 shoats, constitutes 14(11.7%), 16-30 shoats owners were 14(11.7%), 31-50 shoats owners were 15(12.5%) and no shoat owner were 77(64.2%).

4.2.1.15. Income from non-dairy source

This is an important variable which refers income derived from the involvement in other farm and non-farm business activities or in the form of remittance from relatives.

Table 4.12: Distribution of income from non-dairy activities (N=120)

Description	Frequency	Percent
<3000 birr	51	42.5
4000-10,000 birr	61	50.8
Above 10,000birr	8	6.7
Total	120	100.0

Source: computed from survey data, 2010.

As is indicated in table 4.12, income distribution from non-dairy activities was classified into three categories. Those earned less than 3000birr ,constitutes 51(42.5%), are engaged in activities such as charcoal and wooden construction material sale, small business activities in the village like sale of sugar and tea leaf, cigarettes etc, fattening and resale of small shoats, and sale of farm produces including chat. The second group earned 4000-10,000birr, 61(50.8%) were those who are engaged in oxen fattening and sale between the two farming season mid June and early July when the oxen market is hot for middle east export and thereby buy small ones for traction. The last group earned above 10,000birr, 8(6.7%), were those who are engaged in all activities including agribusiness, like growing wheat flour for factories. Therefore ; such kind of business diversification is indirectly promotes participation in milk marketing. In the study area, business oriented households with low milk produce shift their food intake into injera and watt or tea, at least one meal to access for milk selling. This is how they do participation.

4.2.1.16. Membership in milk group

Membership in milk group enables the agro-pastoral and pastoral household to obtain services provided by the milk group such as transport facilities and input supplies. This motivates their participation in milk marketing.

Table 4.13 Distribution of membership in milk group (N=120)

Description	Frequency	Percent
yes	113	94.2
no	7	5.8
Total	120	100.0

Source: computed from survey data, 2010.

As is revealed in table 4.13, out of the interviewed respondents 113(94.2%) sale their through milk group "Iskudarsi" which they belong and 7(5.8%) of them sale their milk on the spot to milk traders locally called "Dilaalato" which means middlemen. These middlemen traders are poor women who have relatives in village and come with car to buy some milk to vender. But milk from both sides goes to the sale agent of milk group in the main market. This shows that membership in milk group is the only way of participation in milk marketing for smallholders because of their low produce.

4.3. Pearson's coefficient of correlation analysis of dependent and independent variables

Based on the designed objectives of the study, Pearson's coefficient correlation was used to identify the factors affecting participation of smallholders in milk marketing as follows:

Table 4.14: Association of independent variables with dependent variable

Independent variables	Pearson' coefficient of correlation	Sig. (2-tailed)	N
Age of the household head	-.040	.661	120
Sex of the household head	1		120
Family size	-.203*	.026	120
Education of the household head	-.336**	.001	120
Experience in dairying	.199*	.029	120
Number of children in school	.205*	.025	120
Small stock ownership	.352**	.001	
Grain production	.186*	.042	120
Amount of loan received	-.192*	.036	120
Dairy production	.256*	.005	120
Distance to market	.238	.009	120
Distance to district capital	-298**	.001	120
Income from non-dairy sources	.011	.907	120
Membership in milk group	.019	.838	120
Exposure to extension services	.[a]	.	120
Access to marketing information	-.037	.690	120

Source: computed from survey data, 2010.

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
[a] Cannot be computed because at least one of the variables is constant.

As indicated in table 4.14, of Pearson' coefficient correlation analysis, the output of age of the household heads has got a negative association with the dependent variable having the value of 0.661 level of 2-tailed significance.
This output implies that the ages of the household heads statistically not significant in relation to the dependent variable; but hypothetically, the age capability of the household heads was hypothesized that it has positive relation with participation in milk marketing activities.

The output of the sex of the respondents shows that there is positive relationship with the dependent variable with no significant value.

As far as family size is concerned, the output of the Pearson's coefficient correlation analysis shows that there is negative relationship with the dependent variable and statistically it is significant at 0.05 level showing 0.026 value at 2-tailed significance.
This result implies that as the number of the household members increases, their consumption in milk increases which has a negative impact on the level of participation in the supply of milk to the group.

The result shown in the table regarding the correlation of education of the household heads with the dependent variable indicated that there is negative association but significant at exactly 0.001 level of 2-tailed significance. This implies that household heads prefer to join other jobs than dairy production if they are well educated. The educated people have access to other jobs so that they are not much interested in milk marketing.

The output of the household heads with regard to the experience in dairying shows that there negative influence on participation in milk marketing if the household heads are not experienced.

Concerning the relationship of number of children in school with the dependent variable, the result indicates that there is positive association and significant at 0.05 level having 0.025 value at 2-tailed significance.
This implies that the financial obligation of educating children has positive contribution on participation in milk marketing because of needs of students for school.

As indicated in the table above, small stock ownership has positive association with the participation of the household heads in milk marketing and significant at exactly 0.01 level at 2-tailed significance. This implies that ownership of small stock increase the household's participation in milk marketing, because they can economically manage the animal husbandry which dramatically increases their participation.

With regard to grain production, the result of the Pearson's coefficient correlation analysis indicates that positively it affects participation in milk marketing at significant level of 0.05 at 2-tailed significance with the value of 0.042. This implies that the need to purchase grain will ultimately increase the participation in milk marketing because of the domestic needs.

The relationship between the amount of loan received and participation in milk marketing is negative but significant at the 0.05 level with the value of 0.36 at 2-tailed significance. This indicates that the more the household head is indebted, the requirement to repay will increase which automatically promotes participation in milk marketing.

The output for dairy production reveals that there is positive relationship with the dependent variable and it significant at exactly 0.05 level at 2-tailed significance. This result implies that the increment of milk production will dramatically increase the participation of the household in milk marketing.

Distance to the nearest market, as indicated by Pearson's coefficient correlation analysis, it has negative relationship with the dependent variable and statistically insignificant at both levels. This implies that the traveling of the household heads from their homes to the

market and time of returning to their homes is reduced by the available of milk cars which collect milk at door steps.

Distance to district capital has a negative relationship with participation in milk marketing as indicated in the analysis of the Pearson's coefficient correlation and statistically significant at exactly 0.01 level at 2-tailed significance. This shows that the selected villages for this study are far from the district capital which makes them impossible to go on foot which automatically decrease their participation in milk marketing during the absence of the milk cars.
The result in the table of Pearson's coefficient correlation analysis for income from non-dairy sources indicates that there is positive association with participation in milk marketing but statistically not significant at either of the levels of significance. This implies that income from other sources contributes to the increment of participation in milk marketing if they are used for investment purposes.

As far as the relationship of membership in milk group with the dependent variable is concerned, it has positive relationship but statistically insignificant. This shows that being a member of the group is a driving force of participation in milk marketing for low milk producing households.

With regard to the access to marketing information, the output indicates that there is positive relationship with participation in milk marketing but not significant. This implies that exposure to marketing information will automatically increase the participation of the household heads in the activities of milk marketing.

4.4. Suggestions for improving smallholders' participation in milk Marketing

Table 4.15: Rank order of suggestions for improving smallholders' participation in milk marketing (N= 120)

S/N		Relative importance of suggestion						Score	Rank
		Less important (1)		Important (2)		Most important (3)			
		N	%	N	%	N	%		
1	Veterinary service delivery	10	8.4	22	18.3	88	73.3	318	1st
2	Genetical improvement of local breeds	33	27.5	33	27.5	54	45	261	5th
3	Formation of milk marketing cooperatives	7	5.8	34	28.3	79	65.9	312	2nd
4	Construction of rural roads	21	17.5	73	60.8	26	21.7	239	8th
5	Improvement of access to credit facility	33	27.5	47	39.5	40	33	247	7th
6	Provision of business skills development training	20	16.7	16	13.3	84	70	304	3rd
7	Installation of milk cooling facility at collection centre	11	9.7	34	28.3	75	62	304	3rd
8	Provision of animal feed	21	17.5	68	56.7	31	25.8	250	6th
9	Improvement of milk handling mechanisms	31	25.8	36	30	53	44.2	262	4th

As indicated in table 4.14, the results of the given suggestions for improving participation of smallholders in milk marketing were ranked based on their respective scores.

Accordingly, the veterinary delivery services was ranked as the primary concern for improving the participation of smallholders in milk marketing, followed by the formation of milk marketing cooperatives which is expected to improve the marketing access of smallholders and eliminate the exploitation of middlemen within the pipeline of milk marketing network. The third rank was given for two suggestions such as provision of business skills development training and installation of milk cooling facility at collection centre, followed by improvement of milk handling mechanisms, genetical improvement of local breeds, provision of animal feed, improvement of access to credit facility and construction of rural roads, ranked as 4^{th} , 5^{th}, 7^{th} and 8^{th} respectively.

4.5. Decisions reached during FGD made by milk traders, milk group Sale agents, milk route car drivers, kebele leaders and community elders

Based on the developed points of discussion in the checklist, the following opinions were forwarded by the group for the improvement of smallholders' participation in milk marketing:

- The consensus of the group has indicated that the current organizational structure of the smallholders engaged in milk marketing is very traditional. Therefore, formation of modern milk marketing cooperatives is recommended so as to avert the problems of poor institutional make up.
- Improvement of milk handling mechanisms and provision of test-kits to check adulteration and milk spoilage is recommended.
- Developing rural roads and other physical access barriers for more participation of smallholders in milk marketing activities are needed.
- Arrangement of access to formal credit facilities for better investment of smallholders is recommended.

4.6. Decisions reached during FGD by key informants of the regional And worada bureaus

- Consensus was reached that less attention was given to veterinary services and the promotion of milk marketing cooperatives. Therefore, enhancement of these services are recommended.
- Improvement of trade links for better milk marketing access of smallholders is needed.
- Inclusion of modern technologies to promote agribusiness in dairy sector is suggested for improving better participation of smallholders in milk marketing.

4.7. Major constraints

- Decreasing number of cattle due to deteriorating environmental conditions, frequent droughts, climatic changes and poor feeding system.
- Low performance of milk producing of local breeds.
- Absence technology for genetical improvement of local cows such as (AI) service delivery.
- Lack of effective extension services for pastoral community.
- Prevalence of animals diseases incidences and less attention given to respond immediately, which caused high death of animals.
- Poor institutional make up of smallholders to have a better negotiating skills.
- Physical barriers to accessing markets due to poor infrastructure.
- Lack access to formal credit facilities for better investment in dairy production sub-sector.
- Existence of numerous middlemen in the milk marketing network.
- Poor handling mechanism of milk, which caused low quality of milk.
- Less attention of input supply and marketing system on the part of public sector.
- Lack of milk cooling and processing plants.
- Lack of collective organization to pool local resources in amore useful way.

- Lack of business development skills trainings for smallholders.
- Absence of milk marketing cooperatives established in area.
- Lack checking mechanism for the heath conditions of collected from different households.

CHAPTER V

CONCLUSION AND RECOMMENDATION

This chapter consists of conclusion and recommendations sections. The conclusion section describes the objectives of the study and gives brief account of methods used and results obtained from the survey. The recommendations section consists of the suggestions of the researcher towards attaining the third objective of the study.

5.1. Conclusion

As described in the introduction part of this chapter, the study was carried out aiming at addressing the objectives such as: to assess the level of participation of smallholders in milk marketing, to identify factors influencing participation in milk marketing and to suggest valuable recommendations for improving participation of smallholders in milk marketing.

The study was carried out in Jijiga worada which was purposively selected from the six woradas of Jijiga zone because of its resource potential in crop and livestock production.

For this study purpose, Multi-stage random sampling was used to selected two milk routes and sample households out of five milk routes. In the first stage, simple random sampling technique was used to select two milk routes. In the second stage, 120 household heads were selected from the villages along the milk routes by using probability proportionate size (PPS) by 8%.

Both primary and secondary data were collected for the purpose of this study. The primary data were collected at household level from people involved in fluid milk marketing. Secondary data were collected from internet, reports, books, journals, articles, and working papers.

For the purpose of this study, both quantitative and qualitative data were collected. To generate data on social, institutional, and economic variables, structured interview schedule was employed. The interview schedule was administered with the help of enumerators. The enumerators were trained on methods of data collection and interview techniques.

For the analysis of the collected data, statistical software known as $SPSS_{-15}$ was used to compute the data and the analyzed data were presented in tables and bar chart.
According to the analysis, to address the first objective, The level of participation in marketing was measured by developing a participation index of having two components such as, involvement with the required activities in milk marketing and increased sales volume of milk. As revealed in table 4.1. the level of participation of the first component was found that 81(67.5%) of the respondents were highly involved, 28(23.3%) of the respondents were in medium involvement and 11(9.2%) of the respondents were in low level of involvement with a corresponding score of 310 which make it first in rank.

It is also indicated in table 4.1. the level of participation of the second component was found that 5(4%) of the respondents were in high sales volume category by supplying 10 litres and above, 32(23.3%) of respondents were in medium level of sales volume by supplying 2-9 litres of milk and 84(70%) of the respondents were grouped in low level of sales volume by supplying ½-1litres of milk with the corresponding score of 163 which makes it the second in ranking.

To reconcile these two extreme levels of participation in milk marketing, the first component which shows high level of willingness and commitment for the involvement with required activities in milk marketing is resulted, to supply low level of sales volume in milk marketing. As a result of, which makes the total, low level of participation in milk marketing is existed in the study area.

To attain the second objective, which is to identify factors influencing participation in milk marketing, Pearson' coefficient of correlation was employed,

Accordingly, the coefficient of correlation showed that out of the demographic variables, only family size and education of the household heads were negatively correlated with participation in milk marketing and significant at 0.05 and 0.01 levels respectively; while the other two variables such as age and sex were not statistically significant but have negative and positive relationship with participation in milk marketing respectively; whereas:

- Experience in dairying has a positive influence on participation in milk marketing because the if the household heads is more experienced he would be able manage more with activities of milk marketing.
- Number of children in school has positive association and significant at 0.05 level having 0.025 value at 2-tailed significance.
- Small stock ownership has positive association with the participation of the household heads in milk marketing and significant at exactly 0.01 level at 2-tailed significance.
- Grain production has positive influence on participation of smallholders in milk marketing and significant at significant level of 0.05 at 2-tailed significance with the value of 0.042.
- The mount of loan received has negative association but significant at the 0.05 level with the value of 0.36 at 2-tailed significance.
- Dairy production has positive relationship with the dependent variable and it significant at exactly 0.05 level at 2-tailed significance more he produce more he will participate and less production causes less participation.
- Distance to the nearest market, has negative relationship with the dependent variable and statistically insignificant at both levels.
- Distance to district capital has a negative relationship with participation in milk marketing as indicated in the analysis of the Pearson's coefficient correlation and statistically significant at exactly 0.01 level at 2-tailed significance.
- Income from non-dairy sources has positive association with participation in milk marketing but statistically not significant at either of the levels of significance.

- Membership in milk group has positive relationship but statistically insignificant.
- Access to marketing information has positive relationship with participation in milk marketing but not significant.

To address the third objective, ranking technique was used. Accordingly, the veterinary delivery services was ranked as the primary concern for improving the participation of smallholders in milk marketing, followed by the formation of milk marketing cooperatives which is expected to improve the marketing access of smallholders and eliminate the exploitation of middlemen within the pipeline of milk marketing network. The third rank was given for two suggestions such as provision of business skills development training and installation of milk cooling facility at collection centre, followed by improvement of milk handling mechanisms, genetical improvement of local breeds, provision of animal feed, improvement of access to credit facility and construction of rural roads, ranked as 4^{th} , 5^{th}, 7^{th} and 8^{th} respectively

.Here, the researcher concludes that the low level of participation of smallholders in milk marketing resulted due to climatical change which dramatically decrease the number of livestock ownership by the households, less attention of veterinary and extension services, absence of smallholders' milk marketing cooperatives, lack of infrastructures, and inaccessibility to credit facility, Low performance of milk producing of local breeds, absence technology for genetical improvement of local cows such as (AI) service delivery, Prevalence of animals diseases incidences and less attention given to respond immediately, which caused high death of animals. Poor institutional make up of smallholders to have better negotiating skills, Existence of numerous middlemen in the milk marketing network and Poor handling mechanism of milk, which caused low quality of milk were among the core factors.

5.2. Recommendations

For the problems which have been hindering the expected level of participation of smallholders in milk marketing, the following suggestions are forwarded by the researcher:

- With respect to institutional make up, the formation of milk marketing cooperatives is strongly recommended to enable them a better link to the market since such kind of cooperative was so far not existed in the region. The concerned bodies can do this by using as an entry point for the current milk groups.
- Provision of technologies and equipments appropriate to their particular set of circumstances is recommended by showing them to the experience of other regions or countries in the same set of circumstances, on the use of new technologies, products and processes to smallholders, so as to enable them to adopt the system that is appropriate and profitable.
- Expansion of adequate marketing infrastructure like roads and transport facilities should be established between rural and urban in the Woreda to support advanced participation in milk marketing.
- Facilitating credit access for smallholders and forming well functioning rural financial system with no or less collateral demands are more significant to promote investment in dairy production and influencing participation in milk marketing.
- Research linked smallholders' extension services is recommended so as to enhance their access to use modern technologies and input emanated from scientific research institutes.
- Promotion of cooperatives' vertical and horizontal integration is recommended so as to pool potential resources of smallholders in a more useful way.
- Introduction of artificial insemination technology to consider the possibility of selection and cross breeding of local breeds for better production in the agro-pastoral and pastoral kebeles where it is feasible is recommended. Because opportunities in milk marketing is growing with the current urbanization of Jijiga city and other outlets such as, export of milk to north Somalia and possibly to the

middle east. To this end, therefore; improving production, processing, health care and overall management system is inevitable for a better participation in milk marketing.

- Arrangement of local fodder seeds disbursement mechanism is recommended.
- Provision of technical skills training in dairy production, processing and marketing is recommended. This will enable to improve the current milk handling system and quality of their product.
- Strengthening marketing information mechanism in a more structured way will enable them to better link with the consumer market.
- Milk pasteurizing units are to be established in the district so to enhance the shelf life of milk.
- Establishing community based disease early warning system and training CAHWS are also crucial to improve participation of smallholders in milk marketing.
- To develop modern range management and conservation of natural pasture(indigenous grass species) is important to avert the problem of cactus and congress weed infestation “kaligii noole”.

5.3. Implication for future studies

The study was conducted in Jijiga Woreda only. There is a need to conduct such studies in pastoralist areas of other Woredas of Somali regional state, which will quite relevant and interesting.

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APENDIX I

Interview schedule

I. General Instructions to Enumerators

- Make brief introduction to each respondent before starting the interview, get introduced to the respondents, (greet them in the local way) get his/her name; tell them yours, the institution you are working for, and make clear the purpose and objective of the study.
- Please ask each question clearly and patiently until the respondent understands (gets) your point.
- Please fill up the questionnaire according to the respondents' reply (don't put your own opinion).
- Please, do not try to use technical terms while discussing with smallholder and do not forget to record the local unit.
- During the process put the answer of each respondent both on the space provided and encircle in the choice.

General Conditions

Date of the interview; Date _____ Month_____ Year _____

Name of the kebele (PA): _____

Name of the village _____

Respondent name (household head):_____

Interviewer (Enumerator) _____

Name of milk-group (If any): _____

Sex of the household head (Put a circle) 1=Male 2=Female

Age in year's _____

Religion (Put a circle) 1= Christian 2= Muslim 3= Others (specify) _____

Marital status of the respondent. 1) single 2) married 3) widowed 4) divorced

2. Family Size, Sex and Age Composition of Household Members

Sex		Age in Years				
		<5yrs	6-10 yrs	11-15yrs	16-65yrs	>65years
Male						
Female						
Total						

Available family labor aged between 15 and 65 years old; _____

3. Educational background of the respondent. 1) illiterate 2) read & write 3) 1-6 grade 4) 7-12 grade 5) university graduate.

3.1 number of household members in school_____.

4. Experience in the farming system (milk production)

4.1 For how long you have been engaged in milk production/dairying activities?(Put √ mark in the box)

1 year ☐

3 to 5 years ☐

>5years ☐

10 and above years. ☐

5. Grain Production;

1. Type of grain

1---------- 3----------

2---------- 4----------

2. Annual harvest (IN QUINTALS)

1---------- 3----------

2---------- 4----------

3. Adequacy of grain for family need or consumption;

2.1. Adequate 2.2. Deficit 2.3. Surplus for sale

6. Amount of loan received in birr for last one year.

6.1 Did you received any loan (Yes-------, No---------)

6.1.1 If yes from where you received the loan

1) Government

2) NGOs

3) Formal financial institution

4) relative

5) others, specify_____

6.1.2. If yes how much you received for the last three years----------Amount of Loan received last year by the household in Birr_____

7. Dairy production at household level in litres.

7.1. How much milk you produce per day in liters? _____

7.2. How much of the produced milk you use for household consumption per day in litres? _____

7.3. What will you do with the remained milk?

7.3.1. Sold to the market in liters per day----------

7.3.2. Donate to the relatives in liters per day----------

7.3.3. Others uses in liters per day----------

7.4 Total liters of milk processed to other milk products by-products_____

Breed type	**Number of dairy cows/camels**	**Number of milking cows/camels**	**Yield/day (Liters)**
Crossbred cows			
Local cows			
Local camels			
Total			

Quantity of milk and milk products supplied to the markets per day at house hold level and type of market recovers

Milk	**Quantity(Liter or kilogram)**	**Buyer type**					
		1	2	3	4	5	6
Milk							

Buyer type 1= To direct consumers in the town

2=To Retailers in the town

3=To the Wholesalers in the town

4=Directly to social organizations (hospitals/schools/hotels)

5= Directly to Milk exporters

6=Directly to others specify

2. Do you have a market liberty?(Yes-------NO--------)Put a √ mark

If no what are the reasons not to have market access and liberty?

8. number of children in school.

8.1.how many of children are in school_____

8.2. what kind of cost you incurred for schooling_____birr

8.3. where is the school ? a) near the village b) in the district town.

9. Income from non-dairy activities in birr for last twelve months.

9.1. Do you participate in other type of works out of milk production and crop production(Yes-------No------) put √ mark

9.1.1 If yes on what type of job you are engaged?_____

9.1.2 For how long you are engaged per a year?

9.1.3 How much you earn from the job per a day, per a week, per a month or per year in birr?_____birr

9.1.4 If no why?

_____

_____

10. Smallstock possession of the respondent.

10.1 number of cows owned_____

10.2 number of camels owned_____

10.3 number of sheep and goats owned_____

10.4 number of equine owned_____

10.5 number of poultry owned_____

11. Financial Obligation;

1.1. Number of students in school (proxy to financial obligation); _____

11.2. Rank how income from milk is spent;

S/No	Type of Expenses	Rank
1	Expenditure incurred for students	
2	To buy grain for home consumption	
3	To buy other food	
4	To buy soap and clothes	
5	For loan repayment	
6	Expense incurred for replacement stock and other farm inputs	
7	Health expenditure	
8	Others (specify)	

12. Distance to the nearest market

12.1 How far is the nearest market for milk marketing in _____Kms or time it take to reach on foot in_____Hrs.

12.1.1. Distance to the nearest dry weather road; __ km, walking time ____ hrs

12.1.2. Distance to the nearest all season road; __ km, " " ____ hrs

13. Distance to District capital

13.1 How far is the village from the capital city of the district? Distance in____Kms or time it takes to reach on foot in____Hrs.

14. Membership in milk-group

1. Are you a member of milk-group? 1. Yes 2. No

2. If yes, what is the name of the milk-group? _____

3. Why you joined the milk-group? How do you become a member of the milk- group?

_____

_____

_____

_____

4. What other benefits do get from membership in milk marketing group? Specify in detail_____

_____

_____

5. How do you rate the degree of satisfaction toward services received from your milk-group?

1. Very satisfied ☐ 2. Satisfied ☐ 3. Unsure ☐

4. Dissatisfied ☐ 5. Very dissatisfied ☐

6. How do you observe the current leadership committment of the group in terms of honesty, accountability, transparency and responsiveness?

1. Very satisfied ☐ 2. Satisfied ☐ 3. Unsure ☐

4. Dissatisfied ☐ 5. Very dissatisfied ☐

7. Do they accurate records of meetings and involvements in milk marketing activities? a) yes b) No

8. As a group how much litres/ jar cans of milk you collect for sale? 1) 1-5 litres 2) 6-10 litres 3) 11-15 litres. 4) above 15 litres.

9. Do you believe that improving the organizational make up of smallholders' will be enabling for better access of milk marketing? A) Yes b) No

10. If your answer in Q-8 is Yes, what kind of organization would you recommend? 1) Cooperative 2) partnership 3) company 4) others specify _____

15. Exposure to Extension Services;

15.1. Do you have access to livestock extension services? 1. Yes 2. No

15. 2. If yes, mention the source and how often you were visited in the last twelve months? 1) once a year 2) twice a year 3) never happen

15.3. Which main aspects of dairying were you advised by livestock extension agent?1) crop management 2) animal health service 3) use of technology 4) all the above.

15.4. Did you find the advice from extension agent adequate 1. Yes 2. No

15.5. If no, what else you needed to be advised? specify

_____

_____

16. Access to marketing information

16.1 Do you get market information? Yes or No

16.2 If the answer is yes how do you get this information? Through,

1) Mass media
2) milk-group
3) neighbor who come from market
4) Others, specify

_____

_____

_____

16.3 What other problems did you encountered during your engagement in milk marketing? 1) price related 2) Buyer related 3) Transport related 4) infrastructure related 5) Milk handling related and others, specify

_____

17. participation in milk marketing

17.1. involvement with required activities in milk marketing. A) high b) medium c) low

17.2. involvement in increased sales volume of milk. A) high b) medium c) low

17. Suggestions for improving smallholders' participation in milk marketing

Table 4.15:Rank order of suggestions for improving smallholders' participation in milk marketing (N= 120)

S/N		Relative importance of suggestion						Score	Rank
		Less important (1)		Important (2)		Most important (3)			
		N	%	N	%	N	%		
1	Veterinary service delivery								
2	Genetical improvement of local breeds								
3	Formation of milk marketing cooperatives								
4	Construction of rural roads								
5	Improvement of access to credit facility								
6	Provision of business skills development training								
7	Installation of milk cooling facility at collection centre								
8	Provision of animal feed								
9	Improvement of milk handling mechanisms								

APENDIX II

Check list for focus group discussion

General Instructions for the Researcher

- ❖ Before introducing the points of discussion, you have to make an acquaintance with the group by first introducing yourself, the organization or institution you work for, and ask them politely to introduce themselves.
- ❖ Introduce the discussion points and invite the group to add if they have special agendas related to the topic of discussion.
- ❖ Jot down the points raised by the group in the discussion

Checklist for Focus group discussion

1. Would you tell us please, the nature of smallholders' milk marketing in your area?
2. How do you rate the level of participation of smallholders in milk marketing, from production, decision to implement, leadership, collecting, packing, and transporting?
3. What are the problems you faced during your involvement in milk marketing activities in relation to access to market, distance, road infrastructure, transport facility, input supply, extension services, and marketing information?
4. Do you think that improving institutional make up of smallholders'would enhance a better marketing link?
5. If so, what kind of organization would you recommend to be established for smallholders? A) cooperative b) partnership c) share company d) others specify
6. Please, you are welcome to add if any information left, your expectations for the future improvement of milk marketing and value addition?