

ASSESMENT OF OPPORTUNITIES AND CONSTRAINTS OF MILK MARKETING AMONG SMALL HOLDER DAIRY FARMERS IN TIYO WEREDA OF ARSI ZONE, CENTRAL ETHIOPIA

YOMIF GEMECHU*1

MBA STUDENT

DEPARTMENT OF BUSINESS MANAGEMENT

FACULTY OF BUSINESS AND SOCIAL SCIENCES

RIFT VALLEY UNIVERSITY, ADAMA, ETHIOPIA

(Corresponding Author) ASSEFA GEBRE HABTE WOLD*2

ASSOCIATE PROFESSOR

DEPARTMENT OF BUSINESS MANAGEMENT

FACULTY OF BUSINESS AND SOCIAL SCIENCES

RIFT VALLEY UNIVERSITY, ADAMA, ETHIOPIA

ABSTRACT

Lack of well-articulated knowledge about the opportunities and constraints of milk marketing among rural farmers affect what support and promotion they need to actively participate in milk marketing. Continuous improvement and active participation of them in milk marketing earn an audit on the opportunities and constraints of milk marketing among smallholder dairy farmers. The study was aimed to assess and identify milk marketing opportunities and constraints among smallholder dairy farmers in Tiyo Woreda of Arsi Zone. Cross-sectional survey study design was employed to assess opportunities and constraints of milk marketing among the selected respondents of 322 rural dairy farmers using purposive and systematic random sampling techniques. Data was collected using questionnaire and interview. Descriptive and inferential statistical methods were applied to analyze collected data. Participant farmers produced 2427.50 liters of milk per day. Of that produced milk volume, only about one fifth was supplied for sales; 37.67% of it through middlemen such as retailer contractors, dairy cooperatives, wholesaler collectors and Local HH contractor consumers. High demands for raw milk, free options to select marketing channel, availability of price competition of buying milk among milk market channel, absence of strong competitors to sell milk and selling fresh milk at production site where cost of transport is covered by buyers were main opportunities of milk marketing. High prices of dairy farming inputs, low level of access to milk marketing information, low access to credit services and lack of finance to improve and expand the milk marketing business, lack of infrastructure like road were the main constraints of milk marketing at the study area. Cross types of cow breeding practice, strengthening access to infrastructures and credit services, access to technical advice regarding to milk production in order to increase volume of milk production, access to milk marketing information are a few of the recommendations were mentioned.

Keywords: Market, marketing, milk, opportunities, constraints, dairy product, Ethiopia.

1. INTRODUCTION

1.1. Background of the Study

Ethiopia possesses the largest livestock population in Africa, estimates for farmer holding in rural areas indicate that the country has about 50.9 million heads of cattle, 22 million goats, 26.0 million sheep and 2.3 million camels (CSA 2010/11). These estimates exclude the livestock population in pastoral areas, as there are no official statistics for the same. Earlier estimates indicated that the livestock sector contributes about 12–16% of the total GDP, and 40% of total agricultural GDP excluding the values of draught power, transport and manure, and contributes to the livelihoods of about 60–70% of the Ethiopian population (Winrock International 1992; Halderman 2004). A recent IGAD study by Behnke and Metaferia (2011) showed that the value of the animal draught power input into arable production is about a quarter (26.4%) of the value of annual crop production, and if the value of draught power services is included, the sector contributes up to 45% of agricultural GDP (<http://www.igad-lpi.org/publication>). These estimates, however, do not again consider the non-marketable values of livestock such as social, cultural, and religious values. Livestock serve as source of food, income, services, prestige and social status in the community. Though milk is one of the livestock products which is used as source of food and income.

The dairy marketing system comprises of formal and informal subsystems. The formal marketing subsystem mainly caters to urban centers while the informal subsystem operates in the rural areas. In Sub-Saharan Africa [SSA], dairy products are marketed through both formal and informal systems. The informal channel involves direct and indirect sales to consumers. In direct transactions, producers sell directly to final consumers at the farm gate. Debrah & Berhanu (1991) reported that producers' knowledge of alternative sales outlets and of price they get would generally enhance their bargaining position and improve their chances of getting the highest prices for their products.

There are ample opportunities for smallholder dairy farmers for marketing raw milk in the country. Establishment of several structures and service centers such as veterinary health and artificial insemination (AI) centers, extensive service of agricultural extension, high demand for consumption of dairy products, huge human population with long-standing tradition of consumption of dairy products, high rate of urbanization and income growth, availability of trained manpower and technologies are some of the good opportunity for milk marketing. To realize these opportunities, the extension system should be reoriented and deliver demand driven and practical oriented dairy extension service to dairy producers that take into account the different production systems, agro-ecology and market orientation Debrah & Berhanu (1991).

Furthermore, the annual rate of increase in milk yield (estimated to be 1.2%) lags behind the increment in human population (estimated to be about 2.7% per annum) (CSA 2008) and this resulted in large supply–demand variance for fresh milk (MoARD 2004). According to Azage the current level of milk production would be maintained, and then about 6 million tons of additional milk (4% increment in total milk production) is required per annum to feed the increasing human population and narrow the gap in milk supply and demand. Thus, the country has been spending foreign currency to import dairy products from abroad to meet domestic demand. For instance, the country spent about 3.1 million USD in 2001 for the same purpose, and this number increased to 9.3 million USD in 2008 (Haile, 2009). The level of foreign exchange earnings from livestock and livestock products are also much lower than would be expected, given the size of the livestock population (Gebremedhin et al. 2007). Therefore, dairy production in Ethiopia is anticipated to increase rapidly in response to the fast growing demand for livestock products resulting from increasing human population, especially in urban areas, and rising consumer income, provided that appropriate interventions are made along the dairy value chain.

The high milk demand in urban areas drive milk production systems in areas closer to big cities to focus on milk marketing, cost minimization and profit maximization (Fonteh et al, 2005 cited in Tegegne, et al., 2013). Unfortunately, these urban areas with the highest market potential for milk are usually heavily populated and have limited land which is preferentially allocated to other activities than dairying.

The annual milk production is estimated to be 1,089,488,251 liters (MoARD, 2007) which doesn't meet even the domestic demand for dairy products. As a result the country imports large volumes of dairy products per annum to meet the domestic demand. In 2014, for instance, the country imported 2544579 kg of milk (liquid and powder) which is equivalent to US\$ 15156394 (MoARD, 2007). The dairy sector is dominated by smallholder farmers who account for about 85% of the population and are responsible for 98% of the milk production (MoARD, 2007).

Thus, investigation into the issues of opportunities and constraints of milk marketing among rural smallholder dairy farmers in the particular study settings is worth addressable.

1.2. Statement of the Problem

It is generally believed that small holder dairy farmers have not fully exploited the actual and potential opportunities in marketing milk by defending existing and perceived constraints in most Sub-Saharan African countries. The opportunities and constraints of milk marketing systems differ from one nation to another, and even within a particular nation from region to region and from Woreda to Woreda. Therefore, in order to mitigate challenges that limit productivity and thereby exploit the untapped potential, it is necessary to characterize and analyze dairy production and marketing systems, identify major constraints and devise pertinent and practical strategies to alleviate the problem and improve dairy production and marketing systems in the country in general, and in Tiyo Woreda in particular.

1.3. Objectives of the Study

The general objective of the study was to assess and identify milk marketing related opportunities and constraints among smallholder dairy farmers in the study area. **The study had the following specific objectives:**

1. To identify opportunities of smallholder dairy farmers for marketing their milk
2. To identify constraints that face smallholder dairy farmers in marketing milk
3. To assess the better means and method of milk marketing related issues in order to fully exploit the opportunities and alleviate the challenges that face the small holder of milk seller farmers at the study area.

2. STUDY DESIGN AND METHODOLOGY

2.1. Description of the study area

Tiyo Woreda has the area coverage of 576 km² which is found in the north western part of Arsi zone bordering Digalu and Tijo Woreda in the south east, Hetosa in the north and North West, Ziway Dugda in the west and south west and Munesa Woreda in the west. Assela is a zonal capital town. The Woreda is characterized by plains, valleys, hills and Chilalo mountain chain (3815m) which is the highest peak in the Woreda. Wurch, Dega, Weina Dega and Kolla (weather conditions) covered 20.1%, 31.7%, 42.5% and 5.7% of the Woreda respectively. There are 18 Farmers' Association *Kebeles* (the lowest administrative structure) with in the Woreda. Total projected rural population for Tiyo Woreda based on the result of NHPC reports for Oromia Regional state is 101, 600[M=51,119; F= 50481] for 2015 (CSA, 2007). Thus, there are 21, 167 HHs in the Woreda.

There are 20,069 local-breeds of cows and 3,550 crossbred cows in Tiyo Woreda. Thus, there are 1.30 cows per HH in this Woreda (TWRADB, 2015). On the average, local cows produce 2.5 liters of milk/day and 10.0 liters per cow per day; whereas they produce 1, 3747, 265 and 9, 727, 000 liters of milk per annum. Tiyo Woreda is one of the potential dairy producers in Arsi zone where the first dairy development project was launched by Swedish International Development Agency (SIDA). So Tiyo Woreda was purposively selected for the study.

2.2. Study Design

The nature of a research model leads to the choice of research design. As the aim of study was presented in chapter one is that at assessing and identifying of opportunities and constraints of milk marketing among small holder dairy farmers at the study area. In this relation, the empirical investigation is based on the quantitative research design methods that agreed with the issues have been presented below.

2.2.1. Quantitative Research

A cross sectional survey design was employed in the quantitative research component. This was because the method enables to describe the realities target of the study. Moreover, the method helps to identify the opportunities and constraints faces the smallholder dairy farmers at the study area.

2.3. Population, Study Sample and Sampling Techniques

2.3.1. Target Population.

In this context of the research, the population was the small holder farmers who have milk cows and produce milk both for household consumption and commercial purpose in the three selected Farmers' Association *Kebeles* of Tiyo Woreda.

2.3.2. Study Sample and Sampling Techniques

In Tiyo Woreda there are 18 Farmers' Association *Kebeles* in Woreda. In this study, Purposive and systematic random sampling method was adopted for the selection of the respondents. In the first stage, from 18 Farmers Association *Kebeles*, 3 *Kebeles* were purposively selected. There are 1968 Smallholder dairy farmers that have milk cows in the selected three *Kebeles* (TWRADB, 2015). From 1968 small holder dairy farmers 322 small holder dairy farmers were selected using systematic random sampling as respondents for the study.

The sample size of smallholder dairy farmers was determined by using the formula of sample size determination for single proportion population, i.e,

$$n = Z^2p(1-p)/d^2; \text{ Where,}$$

n=Sample size for single proportional population

Z= the value of the normal distribution at 95 percent level of confidence; and hence Z=1.96.

p= the portability of randomly selecting the participant from the study population; and since it is random; its value is equal to 0.5

q=1-p=1.0-0.5; so q=0.5 and

d=is the possibility or chance of committing error while sampling; and as the level of confidence is set at 90 percent, its value is 0.05

$$\text{So, } n = 1.96^2 \times 0.5 \times 0.5 / 0.05^2$$

$$= 384.$$

So, the sample size of the HHs of smallholder dairy farmers was 384.

Since the source population is finite, the calculated sample size is adjusted using the formula for adjusting the sample size for finite population as shown below.

$$n_a = n / [1 + n/N]; \text{ where, } N = \text{Number of HHs of smallholder dairy farmers.}$$

$$n_a = 384 / [1 + 384/1968]$$

n= 322.

Thus, 322 HHs of smallholder dairy farmers was the final sample size of farmers that were included in the study.

Projected total number of study population and sample size of the study population per selected *Kebele* administration units in Tiyo Woreda was included in the study (Table 1)

Table 1. Sample size of the study

S.N.	List of <i>Kebeles</i>	Source of population (total HHs)	Total Population (total milk producers HHs)	Sample
1	Burka Chilalo	861	646	106
2	Oda Dawata	1203	721	118
3	Waji Chilalo	1002	601	98
	Total	3066	1968	322

Source: TWARDDB annual report, 2015 (source of population & total population comes from secondary data)

2.4. Method of Data Collection

The study used both primary and secondary data to gather the required data for achieving the objectives. Primary data information on respondents' of small holder dairy farmers was gathered as first-hand information. The method of primary data collection was semi-structured questionnaires and interview questionnaires. Most items of the instruments were developed based on the systematic review of the empirical and theoretical literature. The questioners were prepared in English and was translated to Afan Oromo language before conducting sample survey. Before, starting the data collection, five data collectors who have a qualification of diploma as well as relevant language proficiency in Afan Oromo were employed. An hour orientation, was given on how to contact informants ethically to gather the data effectively. Then, by obtaining the informants' permission respondents were interviewed with the prepared semi structured questionnaires on face to face bases by enumerators. The semi structured questionnaires were used for literate respondents whereas interview questionnaires were used for under educated respondents. Finally, the data was successfully collected.

The specific aspects on which primary data collections focused includes: opportunities or constraints that face smallholder dairy farmers for marketing milk they had produced, major market outlet or channels for smallholder dairy farmers, access of smallholder dairy farmers to veterinary and credit services, milk production volume per smallholder dairy farmer per day and amount allotted for sales, price of milk/liter and socio-demographic characteristics of the respondents.

Secondary data that was relevant to the study was collected from documents and annual reports of Woreda Agricultural office were accessed. The secondary data collected from these sources include: The number of farmers association *Kebeles* in Woreda, number of total households in the Woreda, the total number of small holder dairy farmers who have milk cows in the Woreda, the total demand volume of milk at the study area and adjoining towns were collected from secondary data.

2.5. Method of Data Analysis

The collected data was checked thoroughly before consideration for the analysis. The methods of data analysis depend on the nature of the corresponding data collected. In this study, quantitative data were analyzed using descriptive and inferential statistics such as T-test and correlation test from inferential statistics and mean and standard deviation from descriptive statistics by using SPSS version 20 statistical tool.

2.6. Pilot Study

In this study, validity and reliability test measures were used as preliminary method to identify relevant questions that signify and assess the opportunities and constraints of milk marketing among smallholder dairy farmers.

The collection of questions for smallholder dairy farmers were, fill in the blank, choose and short answers. Validation of Instruments: in this study, to identify relevant items the investigator conducted validity test. The investigator believed that all responses of smallholder dairy farmers can judge the content validity of the items. Therefore, Pilot test was conducted on 30 smallholder dairy farmers from the selected three *Kebeles*. On the first day, the respondents were asked if they were willing to participate in the test pilot. Then, following the request, among these smallholder dairy farmer respondents' agreed to be back for the test survey. Accordingly, the reliability test was based on the responses collected from the respondents respectively.

Reliability of the questionnaire was based on the content validity results the second pilot test was to check the reliability of the questionnaires measured with the objective of the study reliability of the questionnaire designed to assess the opportunity and constraints of milk marketing among smallholder dairy farmers at the study area.

RESULTS AND DISCUSSION

2.7. Socio-Demographic Characteristics

Table 2 shows that out of total respondents, 31.68 percent were females, while the majority 68.32 percent was replied by male. The average percent of female participants on milk selling was less than the male participants on milk selling. This indicated that, gender has relationship with raw milk marketing [the more participants the more milk selling and the less participants the less milk selling]. However the finding shows that the low rate of female participants could influence the milk marketing negatively. The mean age of the respondents was 35 years. 65.53 percent of them were in the age group ranging from 20 to 39 years. In terms of religion, majority [48.14%] of them was Muslims; and Protestants and Orthodox constituted 7.45% and 44.41% percent respectively. Though 48.14 percent of people those followed Orthodox religion the fact that they not consume the milk during the fasting period.

Table 2. Socio-demographic characteristics of the respondent

S. N.	Variables	Features	Milk Non-Sellers	Milk Sellers	Both	
			Quantity	Quantity	Qty	%
1	Gender	M	147	73	220	68.32
		F	68	34	102	31.68
2	Age	20-39	140	114.48	211	65.53
		40-59	46	22	68	20.11
		60 – 65	12	5	17	5.28
2	Residence <i>Kebeles</i>	Burka Chilalo	69	37	106	32.92
		Oda Dawata	67	51	118	36.35
		Waji Chilalo	79	19	98	30.43
		Total	215	107	322	100
3	Religion	Muslims	104	51	155	48.14
		Orthodox	95	48	143	44.41
		Protestants	16	8	24	7.45
		Others	0	0	0	0.00

Source: Survey data

2.8. Production and Sales Volume of Raw Milk

According to the result in table 3 the cross breed types of cows were almost triple of the local breed cows in terms of milk production per cow per a day (2.5L/10L). On daily basis, the participant farmers produced 2427.50 liters of milk. Out of total milk production per a day, 53.86 percent of milk was produced from local type of cows whereas 46.14 percent were from cross breeds cows. Although 1402.5 litres [57.77 percent] of raw milk was produced by non-milk seller smallholder dairy farmers which were used for household consumption, whereas the milk seller smallholder dairy farmers were produced 1024 litre [42.18 percent] of milk which was only supplied to market per day. There were no differences in milk yield per cow per day between non-sellers and sellers with respect to both types of dairy cows.

The low milk provision to the market was due to the fact that most of farmers were engaged in local cow breeding resulted in low milk production per dairy farmer’s household which is not be motivated to supply for market. Thus the sales volumes of cross breeding were larger than the local one which is paradox to the situation. Which means large production does not mean that large provision of milk into the market as seen as total milk production volume.

Table 3. Number of cows, milk and milk sales volume among sellers and non-sellers of milk

S. N	Items	Non milk sellers	Milk Sellers	Total
1	Number of cows owned			
	Local breed type	317	206	523 [82.36%]
	Cross breed type	61	51	112 [17.64%]
	Total cows	378	257	635 [100%]
2	Milk yield per cow per day in liter			
	From Local breed	2.50	2.50	2.50
	From Cross breed	10.00	10.00	10.00
3	Volume of raw milk allotted for sales in liter			Percentage [%]
	From Local breed	NA	515	21.22
	From Cross breed	NA	510	21
	Total sales	NA	1024	42.23
4	Volume of milk not for sale in liter			Percentage [%]
	From Local breed	792.5	NA	32.64
	From Cross breed	610	NA	25.13
	Total sales	1402.5	NA	57.77

Source: Survey data

Based on the annual report of Tiyo Woreda Agricultural and Rural Development of 2015, about 45 percent of the rural population and 68.85 percent of the urban population have the capacity to afford a quarter of one liter milk for their family on daily basis which is consistent with the FAO recommendation. The actual demand for milk in the study area and adjoining towns were about 1,013,788 liters per annum (TWRADB, 2015) whereas the annual sales volume supplied by the farmers in the three selected *Kebeles* was only 130, 972 liters per a year. This implies that the gap between actual demand and actual supply for milk was about 882,816 liters per annum. Therefore, they have high opportunity market demands to fresh raw milk as marketers. Furthermore, the annual rate of increase in milk yield (estimated to be 1.2%) lags behind the increment in human population

(estimated to be about 2.7% per annum) (CSA 2008). This resulted in large supply–demand variance for fresh milk (MoARD 2004).

According to Table 4 the average selling price of liter fresh milk by the farmers to local household consumption, wholesaler collectors, dairy cooperatives and retailer contractors were ETB 10.84, 11.66, 13.00 and 11.50 respectively. This indicates that there is strong competition among the major milk marketing outlets in the specific study settings. However, unlike in the other two selected Farmers’ Association *Kebeles*, competition for fresh raw milk is stiff in Oda Dawata *Kebele* between Gonde Dairy Cooperative Union [GDCU] and the main actors of informal milk marketing. This could be proved by relatively low price ETB 13.00 offered by GDCU and high prices 13.50 by local household consumption, 14.00 by retailer contractors and 14.00 by wholesaler collectors of milk.

Table 4. Price, production and sales volume of raw milk in three selected *Kebeles*

Variables	Category	Burka Chilalo	Oda Dhawata	Waji Chilalo	Sum
Farmers	Producers for HH consumption	69	67	79	215
	Producers for sale	49	44	54	107
	Total	106	118	98	322
Cows owned	Local cows	193	144	186	523
	Cross breed cows	21	59	32	112
	Both cow types	291	176	168	635
Production volume in L	From Local breed per a day	482.5	360	465	1307.5
	From Cross breed per a day	210	590	320	1120
	Total	692.5	950	785	2427.5
Price of milk	Local HH consumer	9.50	13.50	9.50	10.84
	Whole seller collectors	10.50	14.00	10.50	11.66
	Dairy cooperative	NA	13.00	NA	13.00
	Retailer contractors	10.00	14.00	10.50	11.50

Source: Survey data

4.3. Channels for milk marketing

The survey data shows that farmers willing to sell milk at the site of production accounts to 90.58 percent which was purchased by retailer contractor, wholesaler collectors and local household consumers: where as 9.41 percent of the farmers had sold their milk at off production site to dairy cooperative. The farmers sold milk to the market had willing to cover transportation cost of delivery. The largest volume of milk for sales was handled by retailer contractors. That was followed by wholesaler collectors and the lowest volume of milk was made by dairy cooperatives. However these dairy cooperatives were the sole purchaser of milk at off- production but retailers, local consumers and wholesale collectors bought at on-production site. The average price of a single liter of milk at market site to dairy cooperative was higher than the price at on production site selling milk to other market channel [such as local HH consumption, dairy cooperative and whole seller contractors]. Thus, the findings of the study determined that high demand for fresh raw milk among market outlets & consumers, free options to select the major milk marketing outlets, selling fresh raw milk through wholesaler collector’s, retailers contractors and local household consumption contractor were are willing to cover cost of transport for take away the purchased milk were the main opportunities for fresh milk marketing.

Table 5. Percentage of fresh raw milk sold , price and volume of milk marketed

S. no	Items	Responses	
		Volume of milk for sale [daily]	%
1	Demand for milk on- production site		
	Retailer Contractors	517.73 liter	50.56
	Wholesaler Collectors	289.38 liter	28.26
	Local HH consumer contractor	120.53 liter	11.77
	Dairy Cooperatives	96.36 liter	9.41
	Total milk for sale	1024 liter	100
2	Average Price of single liter of milk and milk sold at on-production site		
	Market channel	Unit price	volume of milk sold in Birr
	Retailer Contractors	11.50 birr	5953.89
	Wholesaler Collectors	11.66 birr	3374.17
	Local HH consumers	10.84 birr	1306.54
	Dairy Cooperative	NA	---
	Total milk sold at production site in Birr		10634.60
3	Average Price of single liter of milk at off-production-site		
	Market channel	Unit price	volume of milk sold in Birr
	HH consumer	NA	---
	Retailer Contractors	NA	----
	Dairy Cooperative	13.00 birr	1252.68
	Wholesaler Collectors	NA	----
	Total milk sold at off production site in Birr		1252.68

Source: Survey data

4.4. Access to Veterinary and dairy extension service

For the improved delivery of milk marketing as well as milk production could be determined by the extension service from veterinary. The smallholder dairy farmers who had the opportunity of access to veterinary service could have more healthy cows with better milk production.

According to the survey result of the study in Table 6, out of all respondents, 66.77 percent were non-milk seller whereas only 33.22 percent were milk seller. This indicates that majority of smallholder farmers were used milk for household consumption rather than for sale. Out of total respondents 64.65 percent of non-milk sellers of smallholder dairy farmers had access to veterinary service whereas milk seller smallholder dairy farmer's accounts 96.26 percent. The result shows that milk seller smallholder dairy farmers have more veterinary access than non-milk sellers. Therefore, the milk seller of smallholder dairy farmers that accessed to veterinary service had the opportunity to produce and sell more milk than non-milk seller smallholder dairy farmers. About 20.93 percent of non-milk seller and 5.60 percent of milk seller of smallholder dairy farmers were accessed veterinary service from private providers and traditional veterinary practitioner. They oriented to obtained service from those bodies were due to the distance of veterinary service provided by the government. However the resulted data concluded that, the smallholder dairy farmer near distance to veterinary service could sell more milk than large distance from the service.

Table 6. Access to dairy extension at different gap of distance

SN	ITEMS	Non-Sellers		Sellers		Total	
		No.	%	No.	%	No.	%
1	Farmers	215	66.77	107	33.22	322	100
2	Farmers access to clinic/ dairy extension service at different distance						
	≤ 2km	43	27.04	48	51.61	91	36.11
	3-4km	71	44.65	39	41.93	10	43.65
	5-6km	37	23.27	6	6.45	43	17.06
	≥ 7km	8	5.03	0	0	8	3.17
3	Accessed to veterinary service	139	64.65	103	96.26	242	75.15
	From government providers	94	43.72	97	90.65	191	59.55
	From private providers and traditional	45	20.93	6	5.60	51	15.83
4	Not accessed to veterinary service	76	35.34	4	3.73	80	24.84

Source: Survey data

The study result in Table 7 also determined that milk marketing had statistically significant dependency on the extent of access to veterinary services $p=0.010$], distance of the nearest veterinary clinic from smallholder dairy farmers' home $p=0.000$], and variations in terms of the office of the nearest agricultural/dairy extension workers from their homes [$p=0.000$].

Table 7. Descriptive result to access to dairy extension and related service

No.	Variable	Options	responds	p-value	COR
1	Access to veterinary services	Yes	252	0.010	1
		No	70		2.34
		Total	322		
2	Distance from veterinary clinic	≤2 km	91	0.000	1
		3-4 km	110		18.95
		5-6 km	43		9.39
		≥7 km	8		2.95
		Total	252		
3	Distance from DEW office	≤2 km	44	0.000	1.00
		3-4 km	102		41.77
		5-6 km	83		10.92
		≥7 km	93		3.4
		Total	322		

Source: Computed from survey data

4.5. Access to credit service

It is believed that access to credit improve the financial constraint of smallholder farmers. It enables the dairy farmers to purchase dairy inputs and improved cross breed cows as well as for expansion of their dairy businesses. According to survey result about 82.29 percent [265 respondents] of milk seller dairy farmers had not perceived that access to credit. However it was influenced their milk marketing due to lack of improved cross breed, lack of animal feed and lack of facility. The study also showed that milk marketing had statistically significant dependency on access to credit services [$p=0.000$], access to adequate credit service [$p=0.0410$].

Table 8. Descriptive result of access to loan and credit of respondents

S.N	Variable	Options	responds	p-value	COR
1	Access credit services	Yes	57	0.000	1
		No	265		3.55
		Total	322		
2	Adequate credit service	Yes	25	0.0410	1.54
		No	8		1
		Total	33		
3	Lack of finance as limitation factor	Yes	153	0.0165	1
		No	112		1.51
		Total	265		

Source: Computed from survey data

4.6. Access to advice and information related to milk marketing

According to the results in Table 9 that the majority of the respondents 65.83 percent were didn't acquire advice and information regarding to milk production and marketing. Moreover the results obtained from chi-square test which is based on results tabulated in table 9 below indicated that milk marketing among the participants was dependent on unavailability of information on milk marketing and market outlets [p=0.000] and absence of technical advice on milk production & marketing [p=0.000]. However absence of technical advice and low access to milk marketing information had a weak market influence.

Table 9. Technical advice and access to information about milk marketing

No	Variable	Options	Total	p-value	COR
1	Access to information on milk marketing	Yes	110	0.000	1
		No	212		5.12
		Total	322		
2	Providers of technical advice milk production & marketing	Model framers	107	0.000	3.28
		Neighborhood	83		0.63
		Mass Media	49		2.22
		AEWs	203		1.00
		Total	322		
3	providers of information on milk marketing	DEWs	19	0.0250	1
		AEWs	81		32.17
		Dairy cooperative	3		0.88
		Mass Media	6		17.16
		Others	110		1.49
		Total	219		

Source: Computed from survey data

4.7. Analysis of the effects of various factors on milk marketing

Table 10 reveals that lack of adequate pasture land [1.268±0.6437], high prices of animal feed or fodder [1.438±0.8122], low access to milk marketing information [1.945±0.8732], expensiveness of purchasing prices of inputs to dairy farms [2.162±0.9457], low access to credit and loan services [2.476±1.1032], low raw milk selling prices to the main market channels [3.513±1.3426], low bargaining power over middlemen [4.129±1.6473], low access to infrastructure such as roads [7.804±2.6684] and access to agricultural/dairy extension services [7.887±2.9451] were the main constraints of milk marketing among respondents of small holder dairy farmers.

Table 10. Inputs & infrastructure as constraints to milk marketing & production

	Variable	Mean	SD	t-value	p-value
A	Water	17.304	6.8888	16.440	0.07
B	Electricity	16.431	6.6226	14.905	0.004
C	Low access to infrastructure such as road	7.804	2.6684	16.816	0.05
D	High price of Animal feed and fodder	1.438	0.8122	185.695	0.001
E	Availability of enough Pasture land	1.268	0.6437	238.700	0.004
F	Public transport	12.776	4.5068	8.405	0.094
G	Low access to market information	1.945	0.8732	163.060	0.003
H	Low raw milk price	3.553	1.3426	86.117	0.0001
I	Low bargaining power over middlemen	4.129	1.6473	-64.369	0.06
j	Access to credit and loan services	2.476	1.1032	121.053	0.000
K	Access to agricultural/dairy extension services	7.887	2.9451	14.767	0.000
L	Purchasing prices of inputs	2.162	0.9457	-146.740	0.001
M	Seasonal variation in selling prices of raw milk	17.631	7.1038	16.707	0.07
N	Availability of AI service	19.006	7.6499	18.506	0.06

Source: Computed from survey data

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

The percentage of female participants on milk selling was less than those male participants on milk selling due to the fact that the socio cultural affairs female has low participation in resource control and in other activities. However the finding shows that the low rate of female participants could influence the milk marketing negatively, because more female participation mean more milk selling to the market. In terms of religion, majority [48.14%] of them was Muslims; and Protestants and Orthodox constituted 7.45% and 44.41% percent respectively. Though due to the fact that the near to half of respondents Orthodox religion followers are not consume milk during the fastening period at the study area the milk marketing business decreased at a period and occurred seasonality of price of milk.

According to the study results, even though there is a demand for the milk in the market, most of the farmers in the study used milk for household consumption accounts about [66.77 percent].The low milk provision to the market was due to the fact that most of farmers were engaged in traditional cow breeding resulted in low milk production per household.

The average selling price a liter of fresh milk by the farmers to the market channel such as local household consumption, wholesaler collectors, dairy cooperatives and retailer contractors were varied. This indicates that there is price competition among the major milk marketing outlets in the specific study settings. The average price of a single liter of milk at market site to dairy cooperative was higher than the price at on production site selling milk to other market channel. These was because of the fact that the market channels those purchase milk at production site were covered the transportation cost to capture milk. But when to sell milk at off production site to dairy cooperative, the transportation cost of delivery was covered by milk seller farmers.

It is believed that smallholder dairy farmers who have the opportunity of access to veterinary service could have more healthy cows with better milk production. The study result indicated that milk seller farmers had more access to veterinary service than non-milk seller farmers. Therefore, milk seller farmers accessed to veterinary service had the opportunity to produce and sell more milk than non-milk seller dairy farmers.

According to survey result about 82.29 percent [265/322 respondents] of milk seller dairy farmers had not perceived that access to credit. However it was influenced their milk marketing due to lack of improved cross breed, lack of animal feed and lack of facility as well as problem to expanding their milk business.

Generally, the productivity of dairy farmers is relatively low. While the dairy farm operations, high prices of animal feed, low access to milk marketing information, expensiveness of purchasing prices of inputs to dairy farms, low access to credit and loan services, low raw milk selling prices to the main market channels, low bargaining power over middlemen , low access to infrastructure such as roads and access to agricultural/dairy extension services were statically viewed as the main constraints of milk marketing among respondents of small holder dairy farmers.

Furthermore, milk marketing and main milk market channels had statistically significant dependency [as mentioned in the result and discussion part] on the size of pasture land the farmers owned extent of access to veterinary services and to credit services, availability of advice on milk marketing and market outlets, distance of the nearest veterinary clinic from respondents' houses and the office of the nearest agricultural extension workers.

5.2. Recommendations

Based on the major findings of the study the following recommendations are worth mentionable.

- Small holder dairy farmers have to develop to cross types of cow breeding practice rather than local breed.
- Due attention have to be given to smallholder dairy farmers to ensure equitable access to credit and loan services in order to empower them,
- Necessary milk marketing information and technical advices regarding milk production and marketing should be organized and launched for smallholder dairy farmers.
- Infrastructure like roads and public transportation means have to be facilitated and arranged to rural farmers' association *Kebeles* with high production volumes of milk in order to create easy linkage between areas of large supply and high demand for milk,
- Activities of already deployed AEWs/ need to re-evaluated and considered as to what extent they have undertaken their duties and responsibilities.
- Necessary technical advice and support should be delivered for milk seller rural farmers to form small community level groups.

REFERNCES

- Azage Tegegne, (2003). Financing market-oriented milk development—The case of Ada'a-Liben district milk and milk products marketing association, Ethiopia. *Urban Agriculture Magazine* 9:25–27
- Behnke, R. and Metaferia, F. 2011. The contribution of livestock to the Ethiopian economy-Part II. IGAD Livestock Policy Initiative. IGAD LPI Working Paper No. 02–11. Djibouti: IGAD. (Accessed from <http://www.igad-lpi.org/publication> May 22, 2011).
- CSA (Central Statistics Authority), 2010/11. Agricultural sample survey 2010/2011. Vol. II. Report on livestock and livestock characteristics. Statistical Bulletin. Addis Ababa, Ethiopia: CSA.
- CSA (Central Statistics Authority). 2008. Central Statistics Authority of the Federal Democratic Republic of Ethiopia. Agricultural sample survey 2007/2008. Vol. II. Report on livestock and livestock characteristics. Statistical bulletin. Addis Ababa, Ethiopia: CSA.
- Debrah S H and Berhanu, 1991. Dairy marketing in Ethiopia: Markets of first sale and producers' marketing patterns. ILCA Research Report 19. ILCA (International Livestock Centre for Africa), Addis Ababa, Ethiopia. 21 pp.CSA (Central Statistics Authority). 2009. Agricultural sample survey 2007/2008 (2000 EC).
- Gebremedhin,. and Jemaneh,. et al. 2007. Heading towards commercialization? The case of live animal marketing in Ethiopia. Improving Productivity and Market Success (IPMS) of Ethiopian Farmers Project Working Paper 5. Nairobi: ILRI (International Livestock Research Institute).
- Haile, G. 2009. The impact of global economic and financial crises on the Ethiopian dairy industry. Vienna: UNIDO.
- <http://www.igad-lpi.Org/publication> accessed on January 04, 2015
- MoARD (2007). Livestock development master plan study. Phase 1 report- Data collection and analysis. Volume 1- Dairy. Addis Ababa, Ethiopia: GRM International BV.
- MoARD. 2004. Market-oriented development master plan. Addis Ababa, Ethiopia: MoARD.
- Tiyo Woreda Agricultural and Rural Development Bureau, 2015 Annual reported the number of Livestock in a wereda.
- Winrock International. 1992. Assessment of animal agriculture in sub-Saharan Africa. Morrilton, Arkansas, USA: Winrock International Institute for Animal Agriculture.