

VALUE CHAIN ANALYSIS OF MILK AND MILK PRODUCTS IN BORANA PASTORALIST AREA

COMMISSIONED BY: CARE-ETHIOPIA

Regional Resilience Enhancement against Drought Project

BY

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EXECUTIVE SUMMARY

CARE-Ethiopia has contracted out YONAD Business Promotion and Consultancy Service in May 2009 to analyze the milk and milk products value chain in Borana pastoral community. The main purpose of the study was to undertake an in-depth assessment of the milk and milk products marketing through identifying actors' factors and relationships. The information and results obtained from this study will help CARE-Ethiopia to make an appropriate intervention through its Resilience Enhancement Against Drought Project operating in Borana area in order to improve the livelihood of the pastoralists in one hand and will have appropriate justification why the project engage in milk and milk products value chain on the other. Both secondary and primary data from the five major milk producing woredas was collected covering the whole milk value chain from production to the market as well as the policy, regulatory and institutional framework under which the sub-sector is operating. From a careful analysis and interpretation of information obtained from these sources, the study makes the following nine main conclusions:

1. There are opportunities which the competitiveness of milk subsector can be built up on.

Among others: the existence of well experienced and developed indigenous livestock management system, the rational power share that have women have in the milk production and marketing business, the milk processing culture that the pastoralists have, the unmet demand for milk and milk products at local and export market, the current initiation done by the government to develop infrastructures relevant to livestock development and the existence of relatively many actors in the area are the opportunities in which could enhance the competitiveness of the milk value chain in Borana pastoralists. Capitalizing and exploiting of the opportunities to the benefit of all the actors need comprehensive actions from different actors which lead the situation to be impetus for benefiting the actors along the chain in general and improving the livelihood of the pastoralists in particular.

2. Untapped high milk production potential

It is learnt that there is substantial milk production potential in Borana pastoral area. The study identified that there is a total of 129,029 tons of cattle, camel and shoats milk potential in the area. From this total the cow's milk constitutes about 55% or about 70,000 tons. Among the studied five woredas Yabello is the highest in the total milk production potentials followed by Dire, Miyo Taltale and moyale according to their production potential. Out of this total milk production relatively 44% (30740.16 ton) is supplied to the market, 31% (21654.8 ton) is used for household consumption, 14% (9780.9 ton) for social gift and the remaining 11% (7685.04 ton) is processed at house hold level. As general understanding the milk utilization is affected by the location where the pastoralists based and their wealth status. The pastoralists who are not access to market and urban centres tend to process the milk into butter and arera which enable them to increase the shelf life than the pastoralists accessed to market who have a propensity to

supply the fresh milk to the market. Moreover the pastoralists who have more milking cows and milk production process the milk to other milk products than the pastoralist who have less milking cows and milk production.

3. Small portion of the total marketable milk reaches the terminal market

Out of the total marketed milk in Borana pastoral communities only 6-10% reach to the terminal moyale market which is relatively fetches high return to the pastoralists as compared to other markets. The remaining milk is supplied to rural neighbourhood markets to those who do have livestock but no milking cows and to destitute who do not have livestock at all. Moreover the market share also goes to pre-urban and permanent open markets in the pastoral communities. The vibrancy of portion of the market depends on what happens to rural incomes, rural population and continued growth of milk supply in the particular areas. Generally because of low growth rates in rural incomes¹ and purchasing power of the rural community, the prospects for significant growth for this market are limited to be expanded and developed in the near future. Though this market continues to absorb the biggest marketable milk share will continue to be important, it does not present immediate market-based facilitation opportunities for meaningful expansion to increase the income of the pastoralists. Hence other alternate markets should also be expanded and developed side by side on arena of adding values along the chain which consequently benefits the producers in sharing rational margin from the business.

4. The milk production is constrained by six main factors

Despite the fact that there are many factors affecting the milk subsector in Borana pastoralists the following are found to be the main: low milk productivity, low quality milk, poor organization of development actors in the sub sector and in the chain, lack of business orientation among the pastoralists, lack of market oriented producer organization and lack of poor market infrastructure. The causes of these factors could be categorized into natural, institutional and social. The effect of all these factors on the milk subsector resulted not only decreasing the milk production from time to time but forced the pastoralists to operate the milk and milk products business at loss which consequently trapped them to live in a vicious circle of poverty.

5. Addressing the constraints needs a value chain approach²

It is apparent that all most all the constraints facing the milk industry in Borana pastoralist are cross cutting issues which needs the integrated effort of organizations and institutions that bought-up their vision and mission towards addressing the constraints.

The constraints could not be addressed on a piecemeal approach. One can not address a problem that have a holistic nature independently. Hence this situation calls for the collaboration of development actors (Government, NGOs, Pastoralist groups and private

¹ 73.5% of the Borana pastoralists are poor and destitute in terms of wealth ranking based on livestock herd size

² As an economic development tool the value chain approach addresses issues of: responding to consumer needs conducting efficient and effective business transactions, building upon open communication and trust and resulting in mutually beneficial outcomes for all VC operators. The better all partners in a value chain cooperate, the higher will be the value generated for the individual operator at every stage of the value chain.

sectors) working directly and indirectly in the milk subsector in the area. There fore taking an initiation to promote the problems and the approach so that establishing “Borana Milk Stakeholders Forum (BMSF)” is a means to an end.

6. Organizational and business management and development gaps among the small-scale milk processing units

It was identified that the driving force for small-scale milk processing units in Borana pastoralists is not business viability rather social in nature. Almost all are operating at loss. Out of the four processing units which specific gross margin analysis has done, three of them showed a negative SGM. Lack of appropriate business plan , management and support services, absence of continuous mentoring from development actors ,lack of organizational development skills based on appropriate diagnosis, supply seasonality and low quality raw milk, lack of market for skimmed milk are among other shaded the financial viability of the ventures. But what makes them sustainable is the units are playing a role beyond their core business which they are established for. The members and non members use the venture as a media for saving and credit institutions and are recognized it as a safeguard fore them when ever they face cash shortage for different purposes. In spite of this, the units are also becoming an arena for empowering women pastoralists to increase their role in local social and economic settings.

7. UHT and or pasteurized milk processing companies are required.

To utilize the existing milk potential for the benefits of the pastoralists , taking the market near to the producers through establishing collection and chilling centres and to make the milk business sustainable and competitive the engagement of the private sector who have the capacity to invest on UHT and pasteurized milk processing are crucial. Their engagement will improve the upward stream of the milk chain in the area. The quality will get improved, the pastoralists will get sustainable market for fresh milk, they will access near by market and hence will not be forced to travel a long distance to sell the milk, will have rational margin through agreed and transparent market linkage consequently in implementing these processes the milk subsector become competitive and capture the milk demand found at distant area locally and in Kenya market through the advantages of increased shelf life of the product. Therefore to this effect the feasibility of the milk business has to be studied, the business idea has to be promoted, the local and regional government has top be committed for providing packages of incentives to the investors and finally the business idea should be sold to the investors through milk investment promotion workshop and or through personal contact.

8. Any interventions in the milk and milk value chain should address the poor and women pastoralists.

According to the wealth ranking of pastoral communities based on the livestock herd size they have most of the community are categorized under the domain of destitute and poor categories. Inline with that 28.5% are found to be destitute 45% are poor ,20% are middle group, 5.5% rich and 1% very rich. Hence the total ratio of destitute and poor category constitutes about 73.5%. This figure justifies why the interventions in the area should be pro poor in general and pro pastoral women in particular. Pro-women because the engagement of women in milk production and marketing particularly in the poor category house hold are the

responsibility of women. Moreover, the poor category spends more money to produce a litre of milk than the other categories because of the issues of economies of scale. Hence addressing the poor in the milk value chain case mean addressing the issues of woman and consequently improving the disadvantaged majority of the pastoral community.

9. The milk and milk products value chain and subsector analysis justifies intervening in eleven interventions grouped in to three categories.

It is anticipated all the interventions will be implemented by the stakeholders operating in the area and engaged directly or indirectly on milk and milk products subsector:

9.1. Improving milk productivity and production in the area

In this category there are four interventions are designed. These are:

- Improve the productivity of the range land
- Establish a dry season feeding mechanism for milking cows
- Borana breeds maintaining scheme and
- Improve the animal health

9.2.Improve the institutional arrangement

- Establish Borana pastoralists' milk and milk products stakeholder forum
- Promote and support the existing gender role in milk production and marketing and indigenous institutions in livestock management system
- Support to establish market oriented pastoralists' organization

9.3.Milk and milk products market and marketing

- Support the development of market and marketing
- Support the improvement of milk quality
- Support the small-scale milk processing women groups/units/
- Promote the milk business for the engagement of big private milk processing companies

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Kindly accept our sincere gratitude.

YONAD Business Promotion and Consultancy PLC

Acronyms

AI:	Artificial insemination
CSA:	Central Statistics Authority
DDE:	Dairy Development Enterprise
EC:	Ethiopian Calendar
FAO:	Food and Agricultural Organization
FGD:	Focus Group Discussion
FMD:	Foot and Mouth Disease
GDP:	Gross Domestic Product
ICT:	Information Communication Technology
KM:	Kilo Meter
MASL:	Meter above Sea Level
MOA:	Ministry of Agriculture
NGO:	Non Governmental Organization
PCDP:	Pastoral Commission Development Project
RREADP:	Regional Resilience Enhancement against Drought Project
SGM:	Specific Gross Margin
SLOT:	Strength Limitation, Opportunity and Threat
TLU:	Tropical Livestock Unit
TOR:	Terms of Reference
UHT:	Ultra Heat Technology
USA:	United States of America
VCD:	Value Chain Development
WSRB:	Wabe Shebele River Basin

1. INTRODUCTION

1.1 Overview

This is a report which presents the findings of the value chain analysis of milk and milk products in Borana pastoral areas which is commissioned by Care –Ethiopia through May-June 2009.

The study was carried out by the team of four experts from Yonad Business Promotion and Consultancy Service PLC using a participatory approach that covered all key players in the milk and milk products subsector in the study area. Over 164 peoples from the pastoralists, milk processing women group members, input suppliers, transporters, traders, milk freighters association members ,consumers , government and NGO officials and experts were communicated and made a through discussion on the milk and milk products issues.

The field work was carried out in Yabello, Moyale, Miyo, Dire and Teltale woredas of Borena zone, in Dilla, Awassa towns and Addis Ababa. The study also involved a review of available secondary information on the milk and milk products subsector in Borana in particular and in Ethiopia general. It is information from these sources that the basis on which this report has been prepared.

1.2. Background of the study

Though, there is huge livestock resource in the pastoral communities of Ethiopia in general and pastoralists in Borana zone of Oromia regions in particular, they are not economically benefited out of it in the extent at which ought to be. Consequently, their livelihood is vulnerable to different natural and artificial shocks. Among others lack of appropriate marketing channel and limited degree of response that resulting weak market integration is the impediments which affect the livelihood of these communities. Supporting the pastoralists to engage in different income generating activities including marketing and processing of livestock products could be a means to build their resilience against the shock they are facing. To this end CARE Ethiopia planned to engage the community in milk and milk products marketing business to maximize their income in a sustainable way and consequently improve their way of life. To this effect, the value chain analysis for the commodities has to be done to identify the actors along the chain, their relationship ,factors affecting them, the SLOT and leverage intervention points which affect the chain development.

1.3. Description of Borana Pastoral Area

The study was conducted in Oromia regional state in Borena zone. Five woredas (Yabello, Miyo, Moyale, Taltale and Dire) were selected and are located at the distance of 570-780 kilometres from Addis Ababa.

All the woredas selected for this assessment are situated in lowland of wide pastoral areas with the high potential in livestock production and people engaged in pastoral system as mainstay of the livelihood. The assessment areas are generally characterized by semi-arid climate with mean annual rainfall of 620 mm and range of temperature varying between 20°C

and 35° C. The long rainy season is from March to April and short rainy season on from September to October. The altitude is ranging between 500 - 1500 m.a.s.l.

The total land coverage and utilization also varies significantly in each woredas. However, the data obtained from the woredas indicate that out of the total land coverage about 31% is exclusively allocated for grazing. The others shared among cultivated, forest, bush and non-utilizable land according to the priority sets. The land use pattern in area is communal rangeland utilization managed by effective traditional management system. Pastoralists or agro-pastoralists use their land primarily for pasturing their animals with few practice of agriculture in some arid and semi arid areas.

Similar to the other parts of the country, rapid demographic change is also an issue for these woredas. The data obtained from the woredas selected for assessment indicates there is the annual change in human population, of pastoral areas. The total population of Borana zone is estimated at 1,150,850. The population of the study woredas is 398,918 .The population in each of the study woredas range from 58,000-106,000. The largest population (106,000) belongs to Moyale wereda and Miyo (58,000) stands relatively last.

The pastoralists in Borena are presumably the owners of rich and respected cultural heritage and customary institutions, in which they are invoking for local governance, rules and regulations of social relationship and resource management. Nevertheless, the indigenous knowledge and customary institutions to manage the resource have been adversely challenged by different external political factors and natural phenomena like droughts. The customary institutions still are regulators of the daily mode of life and providers of the guideline in the livelihood of the wide pastoral communities. Pastoral communities in the woredas have been very famous in basic indigenous knowledge and culture in which they are being leading and shaping their social, political and economical life. On top of this the **Gada** System can be sited as one of their culture in which they manage resources, settle conflicts, rule and guide the rangeland utilization and natural resource conservation till this day.

The pastoral areas have been highly marginalized from majority of infrastructure and social services. The magnitude and intensity of infrastructure facilities and social services available in the area is insignificant. Basic services such as health centres and schools are not adequate in the pastoral areas. The number of mobile schools, primary schools, secondary schools and human & animal health clinics and water supply exist in the area are very small in comparison to the human population and the actual situation of the pastoralists.

Albeit, the government is relatively providing due attention to the development of pastoral communities, the major socio-economic constraints still exist in the pastoral areas includes food insecurity, drought, poor access to livestock market service, poor access to veterinary services, shrinkage and deterioration of grazing land due to bush encroachment and expansion of crop land, inadequate water supply (livestock and human), poor support of crop production activity, degradation of natural resource (soil and forest), weak social services (Poor Health service & Poor access to education), and poorly developed infrastructure.

1.4. Objectives of the study

The main objective of the study was to undertake an in-depth assessment of the value chain of milk and products marketing through identifying actors (operators and facilitators), factors and relationships. Moreover to identify the challenges, possible opportunities and threats of the subsector, and to analyze the underlying causes for the dwindling of the supply of milk in the study area.

Besides the above mentioned objective the study have the following specific assignments:

- To review on the relative importance of livestock on milk production, the amount of milk utilized for various uses (household consumption, marketing, donating to relatives ...), and household income.
- To assess the viability in general and cost-benefit analysis in particular of small scale milk processing scheme
- To assess the value chain actors (the players involved in value chain transaction-both from the supply and demand sides) and the nature and scale of their relative functions
- To analyze the factors (internal and external influences) that affect the nature and terms of transaction along the value chain with a particular focus on information flow, transparency and efficiency of transaction
- To examine the relationships which include power, knowledge and benefits asymmetry through out the chain
- To Identify major marketing channels sub channels and routs
- To Identify the key constraints, opportunities and threats of milk and milk products marketing
- To Identify the underline causes of low milk supply and quality in the pastoral area
- To propose simple and practical intervention areas which help to facilitate milk and milk products marketing.
- To conduct gender analysis of the value chain while highlighting of men and women across the chain will be conducted.
- To propose preliminary implementation plan for the project with recommendations for intervention with in the project time frame and alignment with the project objective

1.5. Methodology of the study

The study was conducted by four in VCD, Agricultural Economics, and dairy and livestock development experts from YONAD consult. The following are the approaches and methodologies employed by the team.

- Meet with CARE–Ethiopia RREAD team and reached consensus on the work plan, approaches and objectives of the study
- Identify and collect secondary documents from different organizations who have direct and indirect stake on milk and milk products value chain in (pastoral) Borana areas
- Browsing an Internet for relevant additional data on the sub sector;
- Decide with the CARE-RREAD team the number of woredas to be
- Developing study instruments and data gathering tools and sharing with the CARE-RREAD team for the approval before visiting the field

- Meeting with the Borana zone Pastoral development commission officials and CARE Borana and get common understandings about the study and the selected woredas were priory informed about the study team's mission.
- Visiting and collecting primary data in the field through observations, one-on-one Interviews, focus group discussions, and telephone interviews among other methods. The interviews were carried out with value chain actors in Yabelo, Moyale, Miyo, Dire and Teltale woredas.
- The study team members were thoroughly discussed at the evening of each day reflects on their daily works, evaluate each others work, their final recommendations and identify critical gaps that needed to be filled as part of data collation and quality check and a way of ensuring the TOR.
- Drafting and sharing the first draft report with the CARE-Ethiopia RREAD team for feedback;
- Incorporate the feed back and submit the final report

2. LIVESTOCK AND MILK PRODUCTION IN ETHIOPIA: AN OVERVIEW

2.1. Livestock Production in Ethiopia

Ethiopia is repetitively exemplified as the most potential a country in livestock resource. The resource forms an integral part in the agricultural system and basis of livelihood for entire rural and semi-urban population in most part of the country. The purpose of live stock production is diversified and includes the provision of draft power, food supply, source of income, means of transportation, alternate energy source. In pastoral areas, beyond the economic advantage as a source of income it matters social prestige and status in the community. With regard to the national economy, Livestock production plays a significant role the country's national economy. It contributes about one-third of agriculture's share of GDP, or nearly 15 percent of total GDP.

The country's estimated livestock population is often said to be the largest in Africa. There are approximately 31 million cattle, 23 million sheep, 17 million goats, 5 million horses and mules, 2 million camels, and 57 million poultry. Livestock was distributed throughout the country, with the greatest concentration in the highlands, where more than 90 percent of these animals were located. The raising of livestock always has been largely a subsistence activity.

Cattle in Ethiopia are almost entirely of the zebu type and are sources of milk and meat. However, these cattle do relatively well under the traditional production system. About 70 percent of the cattle are in the highlands, and the remaining 30 are kept by pastoralists in the lowland areas. Meat and milk yields are low and losses high, especially among calves and young stock. Contagious diseases and parasitic infections are major causes of death, factors that are exacerbated by malnutrition and starvation due to frequent drought. Recurring drought is a factor for the loss of huge livestock resource that influences the animal population, although it is difficult to determine the extent of losses. Practically all animals are range-fed. During the rainy seasons, water and grass are generally plentiful, but with the onset of the dry season, forage is generally insufficient to keep animals nourished and able to resist disease.

In spite of the existing enormous livestock resource and great potential for increased livestock production, the productivity is disproportional lower due to various livestock management problems, prevalence of major endemic diseases, poor feeding and high stocking rate on grazing lands. Thus, the contribution of this sector in the agricultural economy of the country remains lower. Indeed, it accounts for merely 30% of the national agricultural output and 40% of the agricultural export (MEDAC, 2006). Lack of support services such as extension services, insufficient data with which to plan improved services, and inadequate information on how to improve animal breeding, marketing, and processing are also critically affect the production.

2.2. Milk Production and marketing in Ethiopia

Milk production in Ethiopia is largely from by the smallholder farmers in the high lands the pastoralists in low land areas of the countries. However, the production is not market oriented and a minor portion of the locally produced milk enters the commercial sector owing to the marketing constraints and lack of processing techniques suitable for smallholder dairying.

In order to sustain milk production to satisfy the increasing demand, efforts to increase milk production should go hand in hand with efforts and knowledge to dispose milk surpluses above local requirement in the milk producing villages. The manufacture of stable marketable products including butter, low moisture cheese and fermented milks will provide smallholder producers with additional source of cash, facilitate investment in the milk production, yield by products for home consumption and enable the conservation of milk solids for future sale or consumption.

The main source of milk production in Ethiopia is cattle but small quantities of milk are also obtained from goat and camel in pastoralist areas of the country. Based on the system of production, Milk production can be viewed at three different sources. These include:

2.2.1. Pastoral milk Production

Livestock production in pastoral areas system that supports an estimated 10% of population covers 50-60% of the total area mostly lying at altitudes ranging from below 1500 m.a.s.l, 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. In this system indigenous stock grazing in pastures in extended rangeland throughout the year and milked twice a day. No supplementary feeding is provided.

2.2.2. The highland smallholder milk production

The Ethiopian highlands possess a high potential for dairy development. These areas are occupying the central part of Ethiopia, over about 40% of the country (Tedla et al, 1989). In the highland areas agricultural production system is predominantly substance smallholder mixed farming, with crop and livestock husbandry. In this system feed for livestock consists of forages, crop residues and stub grazing and hay native pastures.

The majority of milking cows in the smallholders milk production are indigenous breeds which have low production performance with the average age at first calving is 53 months and average calving intervals is 25 months. 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 (Mugerewa et.al 2009). Both the pastoralist and smallholder farmers produce 98% of the country milk production (MOA, 1985 E.C).

2.2.3. Urban and peri-urban milk production

This system developed based on the high market demand in and around major cities and towns for milk and milk products. The main feeds sources are agro-industrial by products (Oil Seed Cakes, Bran, etc) and purchased roughage.

The system comprises small and medium size dairy farms located mainly in the highlands of Ethiopia. Farmers use all or part of their land for home grown feeds. Generally, the primary objective of the production system is to sale milk as a means of additional cash income. The system basically characterized by small scale intensive husbandry with cross breeds not more than 10 heads and managed under zero grazing.

2.2.4. Intensive Dairy Farming

The system is basically characterised by a more specialized dairy farming practises by state and private commercial farms. Most of the intensive dairy farms are concentrated in and around Addis Ababa and are basically based on cross bred stock. The urban, peri-urban and intensive dairy farmers are produce 2% of the total milk production of the country. The system mostly run with cross bred animals more than 20 heads feed on improved pastures, hays and supplemental agro-industrial feeds. Currently, most of the state dairy farms are decline in their management that has been the major causes of inefficiencies in production. There is a downwards trend in milk yields and herd performance. Both the herd size and total number of cows have been on declining trend suggesting acute short fall of replacement herd and supply of breeding stock to smallholder farmers.

2.2.5. Milk Marketing

In Ethiopia, Milk and milk products are channelled to consumers through both formal and informal marketing systems. Until 1991, the formal market of cold chain, pasteurized milk was exclusively dominated by the DDE which supplied 12 percent of the total fresh milk in the Addis Ababa area (DDE 2000).

Recently, however, private businesses have begun collecting, processing, packing and distributing milk and other dairy products. Still, the proportion of total production being marketed through the formal markets remains small (Muriuki et. al 2001). Formal milk markets are particularly limited to peri-urban areas and to Addis Ababa.

The informal market involves direct delivery of fresh milk by producers to consumer in the immediate neighbourhood and sale to collectors or traders nearby towns. In the informal market, milk may pass from producers to consumers directly or it may pass through two or more market agents. The informal system is characterized by no licensing requirement to operate, low cost of operations, high producer price compared to formal market and no regulation of operations. The informal (traditional) market has remained dominant in Ethiopia. The traditional processing and trade of dairy products, especially traditional soured butter, dominate the Ethiopian dairy sector.

3. LIVESTOCK IN BORENA PASTORALIST COMMUNITY

3.1. Livestock management and production systems

Livestock production predominantly forms the basis of the economy in pastoral areas of Borena. It is the main source of food as well as income to support the pastoralist's livelihood.

The existing livestock production system in Borena is that often identified as transhumance system. Transhumance system featured by strategic seasonal movement of pastoralists along with their animal in search of pasture along with water source for human and livestock enable to cope up the effect of relatively longer dry period and returns back to their original place during the onset of rainy season.

The other production system existing in the areas is agro-pastoral system, which is part and parcel of the pastoral system in which pastoralists practice cropping activity beside their activity of livestock husbandry. At present people inhabiting in these areas are still derive greater share of their diet from home produced milk and milk product.

However, there is an increase in permanent encampments and villages in pastoral areas of Borena, that is indicating the extent and pattern of mobility gradually transformed from massive to partial and stepwise movement. In this semi-sedentary system only selected class of herds (the *fora* herd) include the adult animals (male animals, non-milking female, pregnant animals and the young) that can be taken to distant places move in search of grass and water when there is shortage of feed and water around the encampment areas. The pastoral youngsters are responsible to travel away from original places with until the onset of rainy season.

Different Livestock management systems are employed in the pastoral areas of Borena. The management systems depend upon the importance of the livestock species, the purpose to keep the animal, climatic factors, availability of pasture and water, cultural practices and etc. Accordingly, the Borena pastoralists are dealing with different types of livestock management that includes herd mobility, herd splitting, and feeding, watering and breeding systems are the prominent systems practically observed in the studied areas. Even though there is a variation in magnitude and intensity among them, all of them have been directly and/or indirectly influence milk production and productivity in the pastoral areas.

3.1.1. Sheltering:

In Borena Zone there is no cover shelters or shed constructed for livestock. But all livestock are kept in open. Corrals and locally made enclosures or fencing are use for keeping newly born calves from other large sized animals.

3.1.2. Mobility:

Mobile livestock husbandry is the system by which pastoralists move the livestock from place to place mainly in search of grazing and water. The mobile stock can exploit temporary superior range site and can move out of an area before natural resources are deteriorated. In Borena Zone the herd mobility is practiced through herd division systems. During normal wet seasons called *Gana* (March to May) and *Hagaya* (September to November), where forage and water is relatively available, milking animals are stay in the permanent settlement areas. Mobility direction, duration and, size and types of animals is mostly governed by climatic conditions, availability of feed and water, disease out break, peace and husbandry practices and potential of the herd owners. Pattern of livestock mobility during normal year/seasons is from Yabello to *Kotcha*, from Dire, Moyale and Miyo to *Golbo*(Kenya) and Dida Hara (Yabello) and from Taltale to *Golbo*(Kenya) and *Galana* (Konso). During dry years/seasons mobility is from Dire, Moyale and Miyo to northern Yabello up to Bule Hora, and from Yabello to *Burji*, *Malka Sodda* and *Bule Hora* and From Taltale to *Burji* and *Hamro*.

3.1.3. Herd division and herding:

Herd division is the herd management systems practiced by pastoralists of Yabello, Taltale, Dire, Miyo and Moyale. The herd division and rearing systems of Borena pastoralists is known as *Warra* (Village herd) and *Fora* (satellite herd) are practically exercised based on the species, production status, feeding habits and herd sizes. A *Warra* herds are usually kept near the homestead closer to permanent water point and includes immature and lactating animals, small stocks and camels. On the other hand, *Fora* herd includes dry cows, young and male animals and kept far away from the village in search of water and grazing. This dual herding system permits the uniform utilization of the rangeland and helps to minimize feed and water shortage. The system is often intensified during the prolonged dry season and sever drought period and used as coping strategies.

3.1.4. Feeding

The livestock feed is mainly obtained from range land/natural pasture grazing and tree and shrubs browsing. Some fallow land, aftermath grazing and crop residuals are also urging as source of livestock feed during dry season in a very limited pastoral area of Taltale, Yabelo, and Miyo and Moyale woredas. According to the study made by PADS (2005) in the pastoral areas of Ethiopia, natural pastures cover 80%, fallow land 10%, aftermath grazing 2% and crop residuals 8% of the feed sources. This is most probably true for the Borena pastoral areas. The FGD and key informants indicated that there is very little practices of providing supplement feed like concentrates and acacia species pod to milking and weak cows feeding. The practice of promoting these concentrate particularly acacia pod is introduced by CARE-Borena and FAO to mitigate drought risk.

3.1.5. Watering

Temporary surface water, ponds, traditional well “*Ellas*”, hand dug wells like hand and solar pumps and bore holes are the main source of water for livestock in Borana. In all studied pastoral woredas, temporary surface water and ponds are used in the wet seasons. While, traditional well “*Ellas*”, hand dug wells like hand and solar pumps and bore holes are the only accessible water source during dry season. Livestock watering frequency varies from season to season, species to species and accessibility of water sources. During the wet seasons most of the livestock are watered every 1-2 days. But during dry seasons cattle are watered every 2-3 days and camels every 3-5 days based on availability and accessibility of watering points. During dry seasons the pastoralist with their livestock travel more than 6-8 hours per day for looking for of a water source.

3.1.6. Breeding systems

In all the woredas studied pastoralists use controlled and seasonal breeding systems. Traditionally they select breeding bulls based on body conditions, physical performances, sire and dam histories and etc. The pastoral communities are limiting the service time of bull to 6-8 months to maintain active *Le bido* and control inbreeding problems. However, the traditional breeding systems practices currently is under a challenge due to shortage of feed, water and well performed breeding bulls. Hence the pastoralists forced to practice seasonal breeding because during wet season the bulls get feed and water. They practice during the month of May to July for cattle. The breeding of camel is twice a year during the month of May to June and October to November. However, sheep and goat breeding is practiced throughout the year without any controlling.

3.2. Livestock population and production components

The major livestock resource found in the Borena zone as well as in the five studied Woredas includes cattle, camel, sheep, goats and equine. However, for the purpose of this study, livestock resources and distribution analysis is mainly focus on milk producing animals like cattle, camel and goat. The total livestock population of the Borena zone is estimated to 1,216, 143 cattle, 142, 122 camels, 214, 799 sheep and 591, 243 goats. The estimated livestock population in pastoral Woredas also indicates cattle are the prominent in population size and important species and followed by goats, sheep and camels in order of population.

Table 1: Livestock population by species and woredas

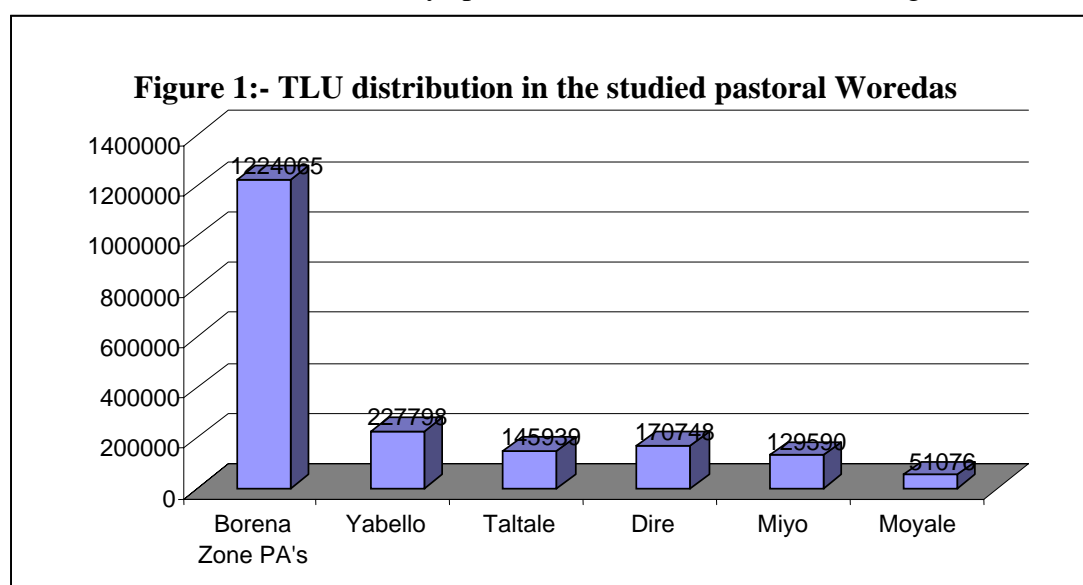
S/N	Woredas	Cattle	Camel	Sheep	Goat	Total
1	Borena Zone PA's	1216143	142,122	214,799	591,243	2164307
2	Yabello	232,949	22972	39043	99681	394645
3	Taltale	165,000	986	39265	88294	293545
4	Dire	173,650	19,286	27,767	59,083	279786
5	Miyo	139,650	10,193	13,737	42,643	206223
6	Moyale	51,894	5,868	6,087	19,104	82953
	Total	1,979,286	201,427	340,698	900,048	3,421,459

Source: Zone and Woredas Pastoral Area Development Office, 2008.

The pastoralists keep as many livestock as possible for different purposes. The types of animals kept vary with the vegetation type in a given area. In the pastoral areas, livestock are kept for their milk, meat and live animal sold as source of immediate cash income. In all studied pastoral Woredas, camels recently become important to most pastoralist households in the areas to cope with the increasing deterioration of key grazing areas and milk shortage during the dry season. During the dry seasons camel milk can support a pastoralists and agro-pastoralists sources food and income generation.

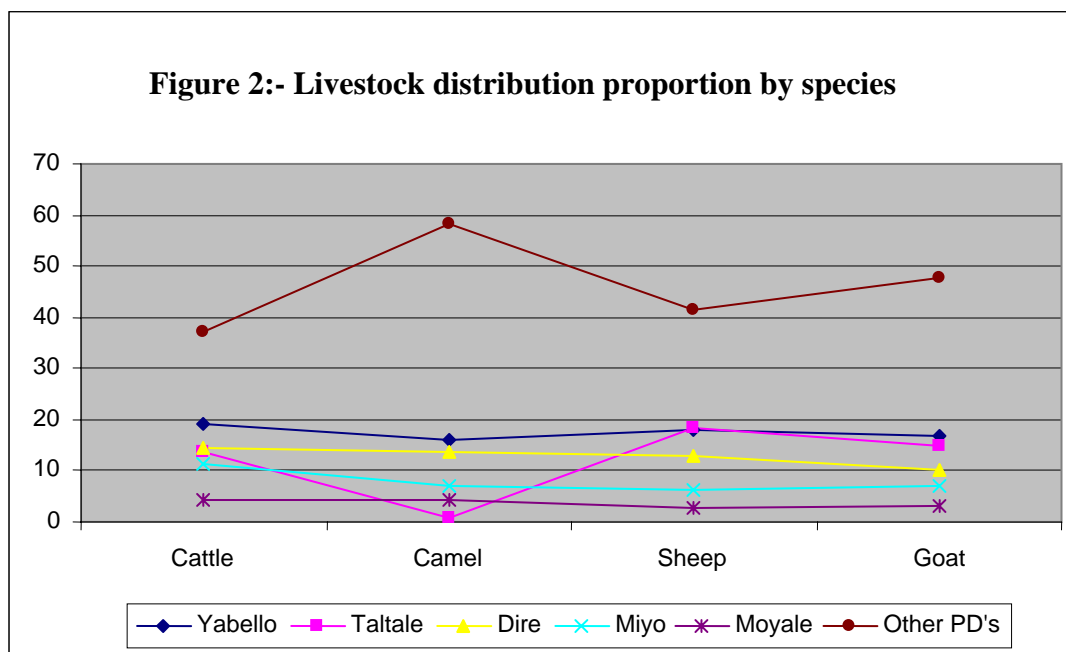
3.3. Livestock distribution and density

Livestock population and distribution across the studied pastoral Woredas of Borena is evaluated both in terms of TLU and ratio of distribution per each livestock species. In calculation of TLU, an average of 0.8, 1.2 and 0.1 unit is used for a head of cattle, camel, sheep and goat, respectively. Population in terms of total TLU, Yabello district is the playing the leading role by about 222,008 TLU and followed by Dire, Taltale, Miyo and with total livestock population of 170,740, 145,372, and 127,014 TLU, respectively. Moyale district is the ranking the least population having only 51,076 TLU. The detail description of TLU livestock resources distribution by species and Woredas is shown on figure 1 below.



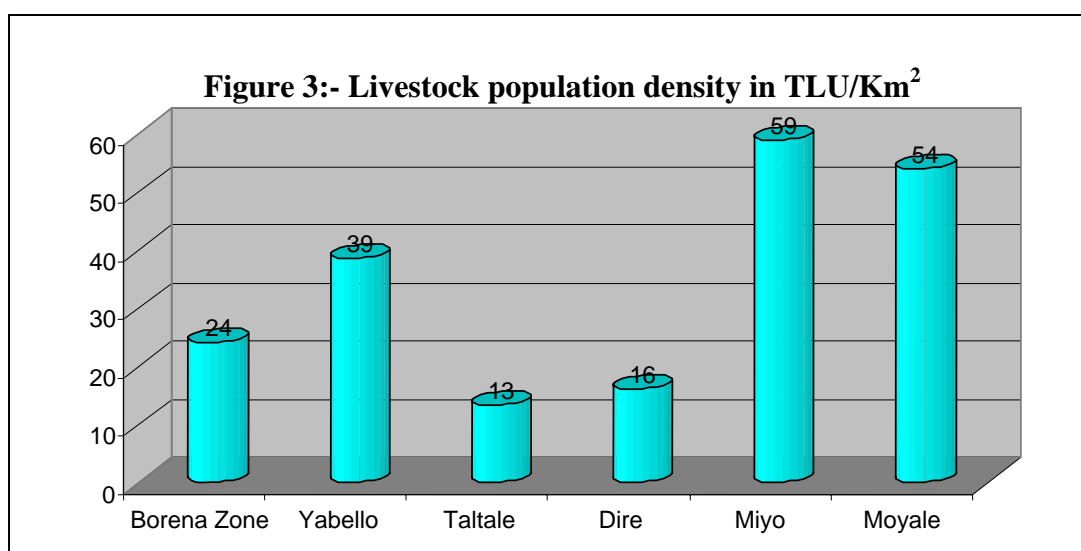
Source: Computed from Zone and Woredas Pastoral Area Development Office, 2008.

On the other hand, livestock resources distribution across the Woredas in species is also analyzed to know the distribution rate and identify the potential of Woredas which by what. Accordingly, among the studied pastoral woredas, the highest proportion of cattle is found in Yabello (19 %) and followed by Dire and Taltale (14%) and Miyo (11%). The cattle distribution proportion is lowest in the Moyale (4%) among all pastoral Woredas of the Borena zone. Camel is also distribution unevenly, highest in Yabello (16 %) and followed in Dire (14%), Miyo (7%) and Moyle (4%). The detail description is shown on Figure 2 below.



Sources: Computed from Zone and District Pastoral Development Office, 2008

Livestock distribution density is calculated from the total livestock population in TLU and land areas in Km², where, total livestock population is divided by land mass areas in Km². In Borena pastoral areas on average about 24 TLU livestock herd are reared on 1Km² rangeland areas. In general, as indicated on the Figure 3, the livestock distribution density is highly variable across each studied Woredas. The highest livestock distribution density is found in Miyo (59 TLU/ Km²) and followed by Moyale (54 TLU/Km²). On the other hand, livestock distribution density is lowest Dire (16TLU/ Km²) and Taltale (13 TLU/ Km²).



Source: Computed from Oromia Pastoral Areas Land Use study Project (On going and unpublished), May 2009

3.4. Household herd size and Wealth ranking

3.4.1. Household herd size

The average livestock holding per household for the Borena Zone pastoral areas is estimated at 5.5 TLU/ household. The highest average livestock holding is accounted in the Yabello wereda which is estimated at 12.4 TLU/ household and followed by Miyo, Taltale and Dire with estimated average holding values of 10.2, 9.7 and 8.5 TLU/house hold respectively. Moyale district is the lowest average livestock holding with 3.0 TLU/ household. The following table depicts the situation

Table 2: Description of Household herd size

Woredas	Human Population	Total HH	TLU	LS holding rate (TLU/HH)
Borena Zone	1,150,850	209245	1156380	5.5
Yabello	98172	18183	225903	12.4
Taltale	74028	14806	144289	9.7
Dire	61900	13026	111147	8.5
Miyo	58616	12627	128384	10.2
Moyale	106,202	16653	50669	3.0

Source: Field Survey May, 2009 and Oromia pastoralist development commission May 2009

3.4.2. Wealth ranking

The basis for the wealth ranking and categorization is the size of herd owned by an individual pastoralist. The social setting and wealth ranking among the pastoralists and agro-pastoralists of Borena Zone is traditional and divided into five wealth categories. These are (from lowest to highest wealth ranking) “*Qolle*”(destitute), “*Iyyeessa*”, “*Bulti qabeessa*”, “*Dureessa*” and “*Dureessa Jaama*”. The Boranas describe “*Qolle*” is an individual who own no livestock. About 27-30 % of the population in Borana pastoral area is of this category. The second

wealth category “*Iyyeessa*”(poor) is the poor pastoral community members those owning 1-5 heads of cattle and 5-10 heads of sheep and/or goats and estimated at 40-50% of the areas pastoral and agro-pastoral households. The third category “*Bulti qabeessa*” is comprises the middle wealth owning social group clusters those holding an average herd size 10-20 cattle, 20-30 sheep and/or goats and 1-5 camels. The fourth and the fifth categories “*Dureessa*” and *Dureessa Jaama*” are the rich and very rich social groups and those owning high to very high different species livestock herds, respectively. “*Dureessa*” owns up to 150 cattle and the same shoats. *Dureessa Jaama*” own more than 150 cattle and shoats. “*Qolle*” and “*Iyyeessa*” pastoral and agro-pastoral wealth groups are very poor and poor food in secured social cluster and cover more than 60 % of the total households of the five studied pastoral woredas. “*Bulti qabeessa*”, “*Dureessa*” and *Dureessa Jama* wealth groups are traditional characterized more or less as food secured social clusters.

Table 3: Wealth ranking breakdown by herd size

S/No	Wealth ranking	Herd size holding			Household %	
		Cattle	Shoat	Camel	Range	Average
1	Destitute (<i>Qolle</i>)	0	0	0	27-30	28.5
2	Poor (<i>Iyyeessa</i>)	1-5	5-10	0	40-50	45
3	Middle (<i>Bulti qabeessa</i>)	10-20	20-30	1-5	16-24	20
4	Rich (<i>Dureessa</i>)	25-50	40-60	5-7	3-8	5.5
5	Very Rich (<i>Dureessa Jama</i>)	> 200	> 100	10-15	1-2	1

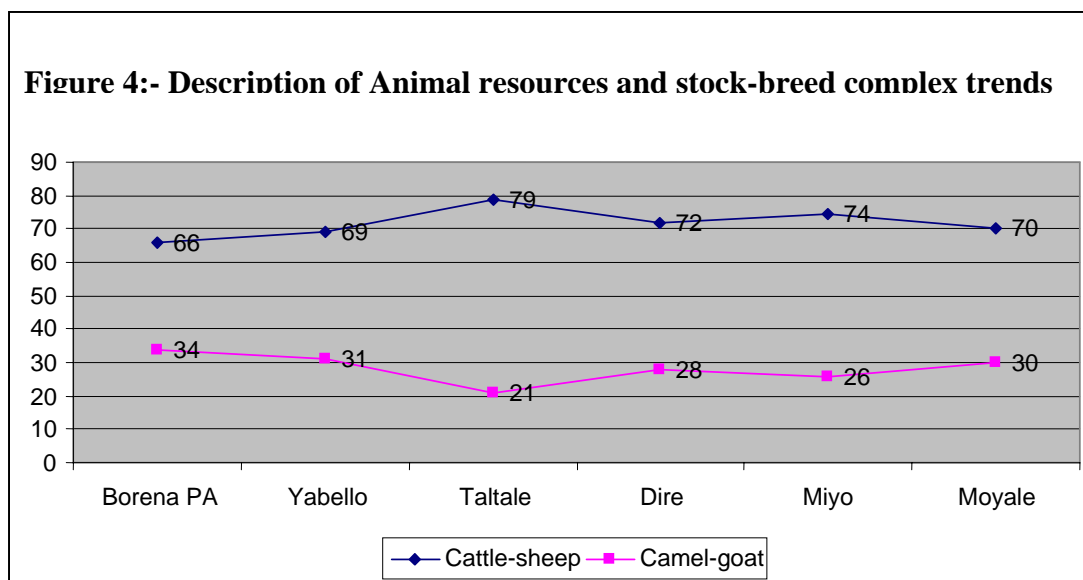
Source: Field survey data May, 2009 and CARE, Livelihood Profile of Borena and Guji, 2008

3.5. Stock- breeding complex and herd compositions trends

The pastoral and agro-pastoral communities have different animal resources and stock-breeding complex. The prevailing one are the cattle-sheep and camel-goat complexes. The cattle-sheep complex is characterized by grazing and reared in the grassland, where as camel-goat complex is characterized by the browsing of tree and shrubs. The livestock resources and stock-breeding complex have a direct relation with milk production and productivity. Analysis of livestock resources and stock-breeding complex of the Borena zone is considered to take advantage of this. Accordingly, as shown on the figure 5 below, the Borena zone as well as all studied five woredas is dominantly overwhelmed by cattle-sheep complex animal resources. However the proportion of cattle-sheep and camel-goat complex is varies among the woredas. Miyo pastoral district is found to be the highest cattle-sheep complex animal resources with 74% and followed by Taltale (79%), Moyale (70%) and Yabello (69%). Where as, Dire pastoral district is found to be the lowest cattle-sheep complex animal resources with only 55%. The camel-goat complex is highest in Dire (45%) and followed by Yabello (31%), Taltale (30%), and Moyale (30%) and Miyo is the lowest one. The highest camel-goat complex proportion in Dire is resulted from high proportion of goat but not camel population.

In general, cattle-sheep complex proportion is higher and camel-goat complex proportion is lower in all Borena Zone pastoral areas and sharing 66 % and 34%, respectively. It was learnt

from the focus group discussion and key informant interview that the trend of camel-goat complex in Borana is increasing at increasing rate. This is due to the short recurrent drought cycling and dominance of browsing plant species and trends of woody bushes and shrubs encroachments in the areas. The respondents indicated that before the last 3 to 4 decades camels were reared and owned by Gabra and Gari clans of Somali. However the Borena and Guji pastoralists are started rearing camel in a very recent time and used as a means of livestock diversification. The reason behind is to cope with the risk of livestock losses during the recurrent drought phenomenon. During the drought season there is no grass but bushes and shrubs which is browsed by camel and goats.

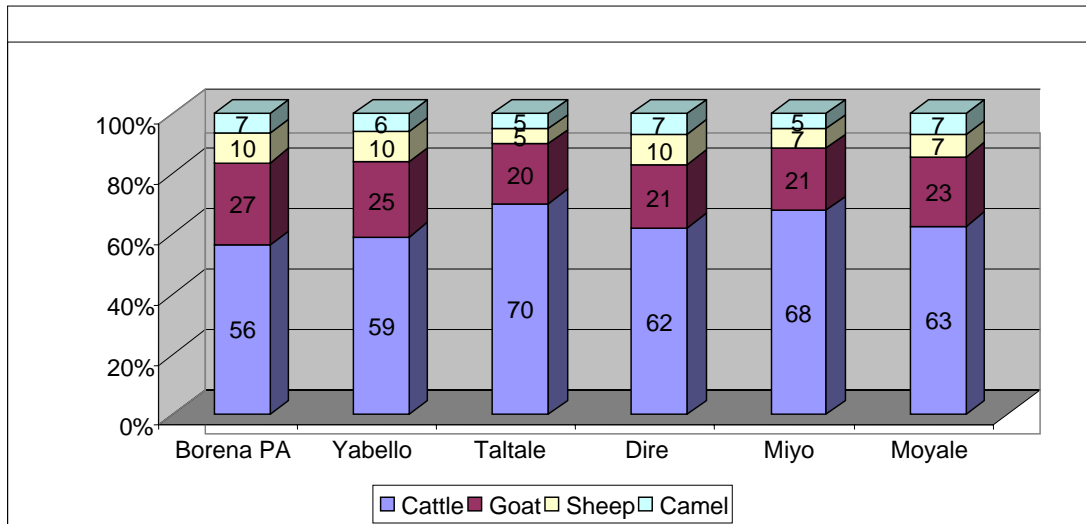


Sources: Field Survey, May 2009

As can be seen from the figure 4 in the pastoral areas of the Borena Zone cattle-sheep are the most dominant one and sharing on average about 56 % of the total zonal livestock resources , followed by goat stock with 27% sharing and Camels take only 7 % of the total livestock resources of the Zone pastoral areas.

However, the study identified that since the recent two decades the population of camels shows increasing trends due to bush encroachments and their habit of tolerance to recurrent drought risks. The trend is almost the same in all studied woredas .In all woredas, cattle are sharing the highest proportion and followed by goats, sheep and camels, respectively, except in Dire district where the sheep population is the lowest. Figure 5 depicts the situation.

Figure 5: Description of herd composition rate by Woredas



Sources: Field Survey, May 2009

The trend of cattle population is declining. As indicated the by pastoralists groups consulted during FGD the recurrent drought that ruined high number of cattle is the prominent reason for the increasing change in the over all livestock composition.

4. MILK AND MILK PRODUCTS PRODUCTION AND MARKETING

4.1. Milk production systems

Milk is one of the most important livestock products among the pastoralists in the Borena pastoral communities. It is the main diet for pastoralists. Milk production from milking animals (Cattle, camels, sheep and goats) is influenced by their population and distribution, and the availability of natural pasture and water. Besides, types of animal breeds, the composition of milking animals in herd and etc are one of the most important factors influencing milk production in the pastoral systems. The milk production also directly correlated with the environmental situation. The better the environment/climate the better is the milk production and vice versa. The milk producing animals (cattle, camels, sheep and goats) in all studied pastoral woredas are indigenous breeds. Cattle are well recognized in their dual purposes production and hardiness and known as the Boren breed type and the camels are single humped breed type. The sheep and goats are commonly known as Black head Ogden and Boren breed type, respectively.

In Borena pastoral areas, milk is produced from cattle, camels, sheep and goats. Milk production is also practiced under traditionally well organized communal land and stock management systems. The community and their grazing land is divided into groups known by *Dheda*, and milking animals (Cattle, camel and shoat) are also herded communally within each *Dhedas*. Milking animals are part of the *Wera* herds and herded separately from other *Fora* herds, staying nearer to the community base where the family groups are found. However, most of the respondents during the study complain that the traditional ways of communal land and stock management systems are becoming weak from time to time. This is because of the increment of livestock and human population, shrinkage of range land, competition for grazing and agricultural land from other pastoralists and agrarians groups (e.g. Somali, Konso and etc) and climatic changes.

Moreover the study identified that during prolonged dry season and drought hazard, milking cows move further away from pastoralists' camp to take advantage of grazing and water sources. However, the mobility of milk producing camels, goat and sheep are mostly restricted to near by community bases.

The animals milking frequency per day varies based on the type of livestock species and seasonal calendars of the year. In addition to this traditionally newly birth gave animals are not milked up to 2 to 3 weeks until the calves getting more milk and colostrums which help to develop immunity and to get strength .

In wet season, where forage and water is relatively available, lactating cows are milked twice a day during early in the morning before grazing time and evening after grazing. Traditional cows those lost their calf due to death will not be milked even though they are able to supply milk. On the other hand, during prolonged dry periods where feed and water is highly scarce,

the pastoralists do not milk the lactating cows rather focusing on cows and calves live saving as much as possible.

Camels are milked 4 to 6 times a day based on the amount and sequences of milk accumulation in the udder. This is traditionally practiced to get an advantage of relatively high daily milk production from the small sized camel udder by encouraging a maximum daily milk secretion of mammary gland through regularly milking. However, this is practiced during wet season, where feed and water is relatively available and milking camels are stay near the permanent settlement areas of the pastoralists and agro-pastoralists. During normal and prolonged dry seasons camels are milked twice or once a day by herders and may be also milking is ceased based on the intensity of feed and water shortage severities.

Sheep and goats milking practice is depend on the availability of cattle and camels milk, milk production potentials and other issues. Sheep and goats milking are mostly practiced by children for their own on spot consumption. The family members consume this milk by mixing it with tea when there is a scarcity of cow milk. Milking time per a day is varies depending on needs, production potentials and availability of feed and water.

4.1.1. Quantity of milk Produced

To estimate the total milk production in the pastoral area the following parameters were used: livestock population, female and lactating animals' proportion in the herd size, length of lactation period and milk yield per day per animal. Moreover the following assumptions were also used to identify the milk production size for each of the milk producing species.

Cattle Milk: Out of the total cattle population in Borana pastoralists, the mature female animals kept for milk production are identified and it is found to be 38.42% and of these about 60% assumed is milk producing animals annually (CSA, 2000/2001 and J.PAGOT 1993).

Besides this proportion the productivity of milk i.e. milk litre/ animal /day is also identified from the study and ranges between 0.5 litters and 2.5 litters and an estimated average of 1.5 litters/cattle is taken . The lactation length is also ranges between 120 to 270 days based on availability of feed and water as well as length of dry seasons and an average of 180 days is considered.

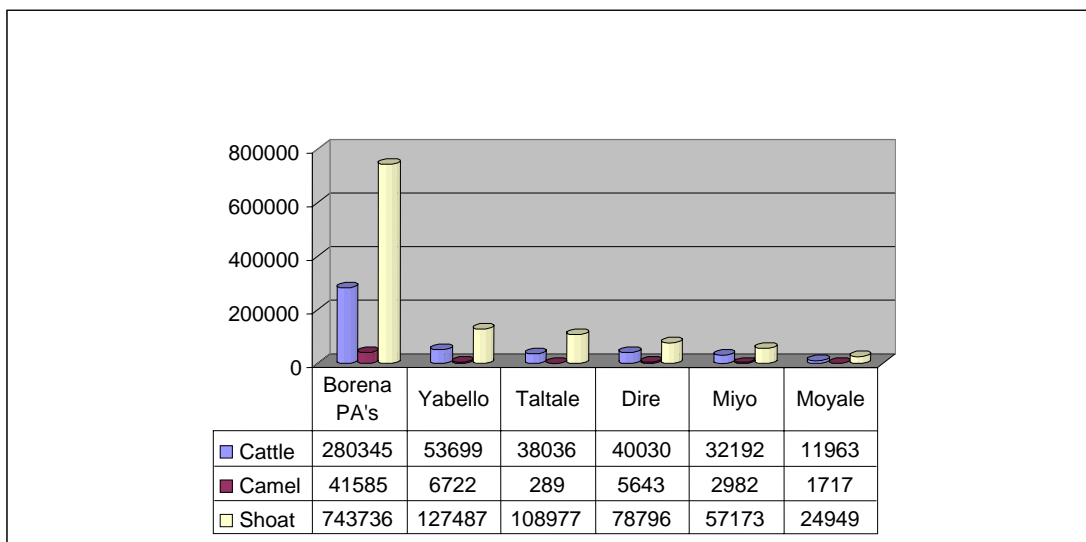
Camel Production: In estimating camel milk production the following variables were taken: the total camel population found in the Borena pastoral areas and out of this value the female camels above four years age are taken into account and found to be 58.51% (CSA, 2000/2001). It is also assumed that out of this percentage about 50% female camels are assumed are under milking. The average daily milk yield is estimated to 3.5 litters and the average lactation period is year round for camels.

Shoat: As Shoat (sheep and goats) are also one of the milk supplying animals in the Borana .pastoral areas, their milk production is calculated based on annual report of CSA, 2000/2001 Accordingly, of the total shoat population about 52.8 % population are assumed to be female and of these about 12.04 % are used for milk. The average daily milk for both sheep and goats in Borena pastoral areas is estimated to be 0.25 litters and the average lactation length

for two lambing and/or kidding is estimated to about 90 days (W.S.R. B. Master Plan Study, 2003).

Based on the above assumptions, in overall Borena pastoral areas, an estimated amount of 258,757 cows, 45,413 female camels and 51,082 females shoat are under milk production annually. Among the five study woredas Yabello plays leading role in both milking cows and shoat population and followed by Taltale. Dire is highest in milking camel population and followed by Yabello and but, lowest in milking cows population. The detail analysis is shown on Figure 6 below.

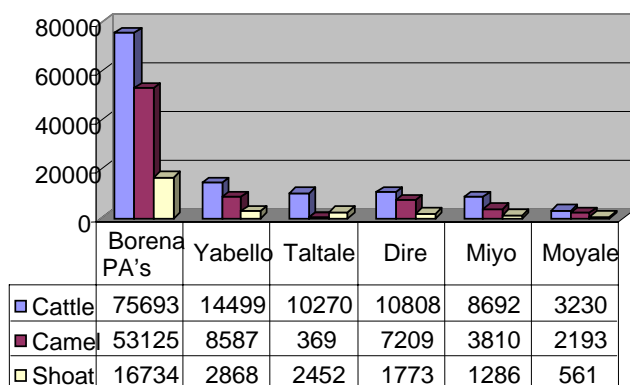
Figure 6: Population of milk producing animals by woredas



Sources: Field survey May 2009 and Woredas Pastoral Development Office, May 2009

Accordingly, currently the amount of milk expected from all milk producing animals in overall Borena pastoral areas is estimated to about 129,029 ton. Of this total milk cow's milk ranks the highest with annual production of 69,864 tons and followed by camels and shoat milk with annual estimated value of 58, 016 and 1,149 tons, respectively. Yabello district is the highest in the total milk production potentials and cattle milk production and followed by Dire, Miyo and Taltale. Moyale is the lowest in overall milk production. The detail analysis is shown on the Figure 7 below.

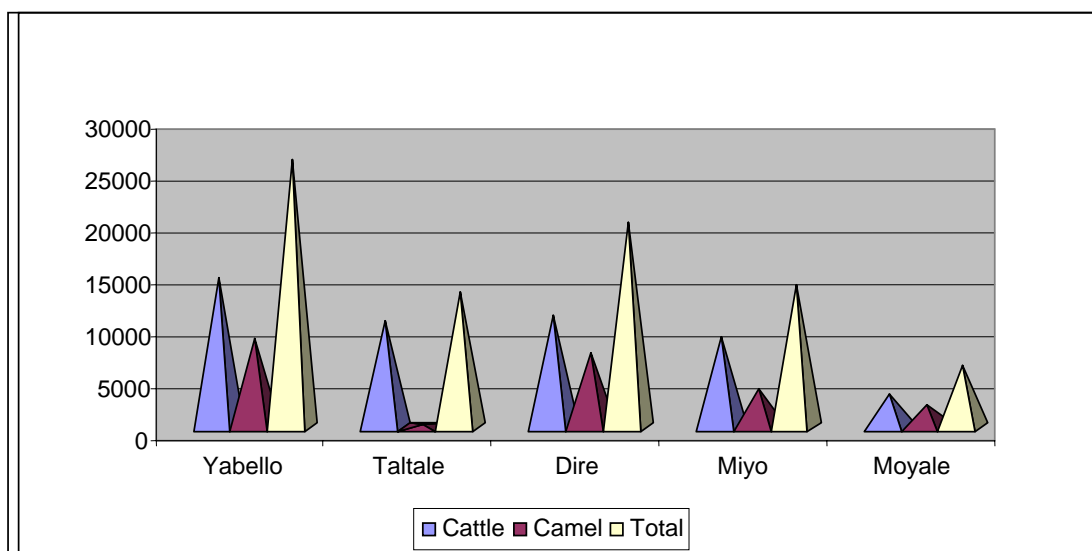
Figure 7: Current milk production status in Borena Pastoral Areas in Ton



Sources: Field survey and own computation May 2009,

Based on milking animals' population and current status of milk production per animal, Yabello stand first in both cattle and camel as well as in total annual expected milk production potential. On the other hand, Dire, Miyo, Taltale and Moyale woredas are standing at 2nd, 3rd, 4th and 5th ranks in the expected annual total and cattle milk production potentials respectively. Taltale is the least annual camel milk producer.

Figure 8: The status of woredas in milking animals



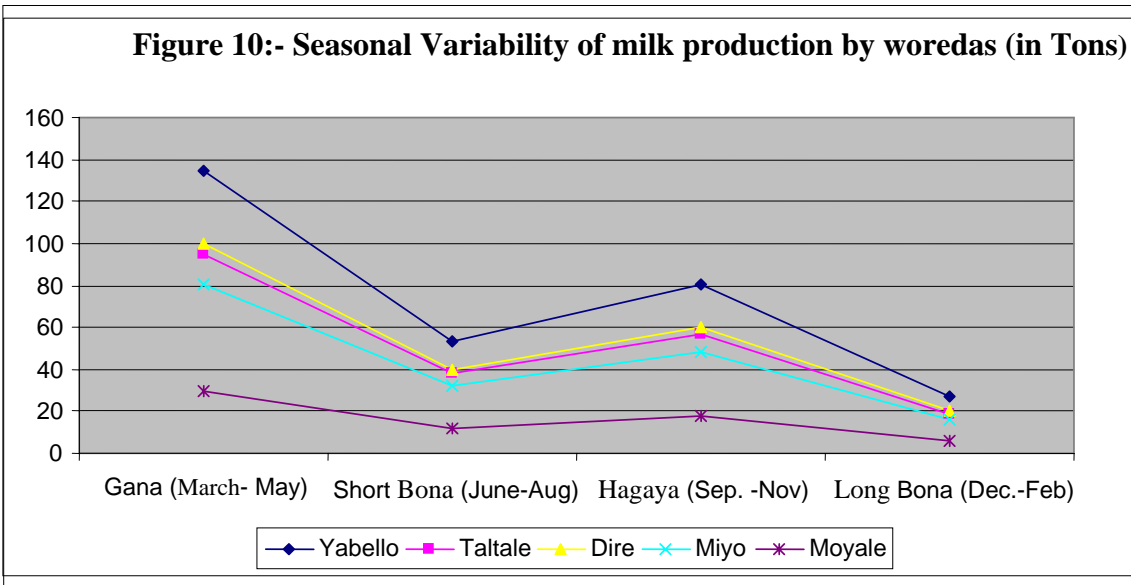
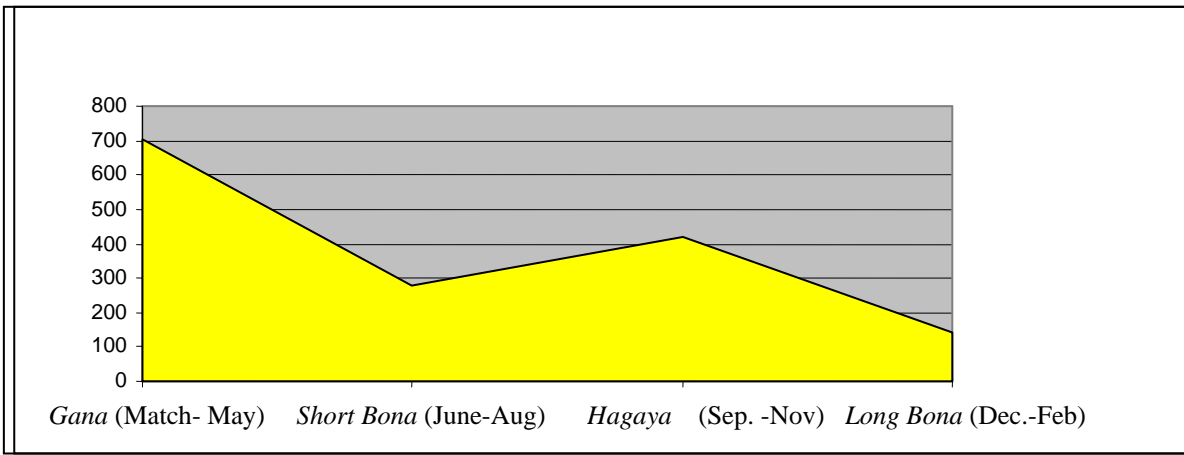
Sources: Field survey and own computation, May 2009

4.1.2. Seasonal Variability of milk production

Milk production and productivity is affected by the seasons of the year. There is more milk is produced with high productivity (litre/cow) during *Ganna* or wet season (March, April and May) and short rainy season called *Hagaya* (September and October) and productivity is fluctuated over season and years. Seasonal variability of milk production in the Borena pastoral areas is basically managed by amount and distribution of rainfall, and availability of forager and water. Based on these events milk production is fluctuated in the four seasons of year and from year to year. Accordingly, cows milk yield during short *Bona* (June to August), *Hagaya* (September to December), *Long Bona* (December to February) and *Ganna* (March to May) is estimated to 1lt, 1.5lit, 0.5 lit and 2.5 lit per head/day, respectively.

Based on this information and norms, milk production in all Borena pastoral areas is relatively highest during the *Ganna* (wet) season (March to May), medium in *Hagaya* season, low in short *Bona* season (June to August) and very low in long *Bona* season (December to February). Figure 9 and 10 show seasonal variability of milk by season and by woredas respectively.

Figure 9: Seasonal Variability of milk production in Borena pastoral areas (in Tons)

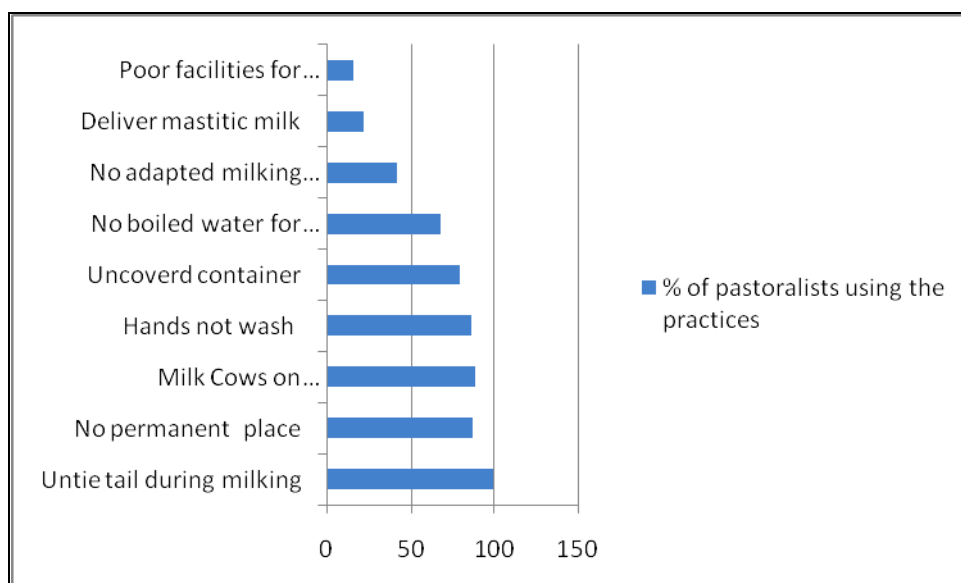


Sources: Field survey and own computation May, 2009

4.1.3. Milk quality

Milk production practices influenced the level of contamination at the production level. Some of the most important practices and the extent of their application are shown in Figure 11. Most pastoralists did not tie the cow's tail during milking, had no appropriate and permanent milking place, most of the pastoralists do not milk animals on treatment, did not wash hands before milking, did not cover the milk and had no potable (boiled) water for washing hands and utensils. Moreover some of the pastoralists deliver mastitis milk and use poor facilities for drying container. Tying of the tail is important in the local setting because cows carry a lot of dust or mud from the stable on their body. During milking, a lot of this dust is dislodged by the constant waving of the tail to drive away flies. This constitutes one of the most direct methods of milk contamination. The following figure depicts the percentage of pastoralists using the stated practices.

Figure 11: Most common milk handling practices by Pastoralists

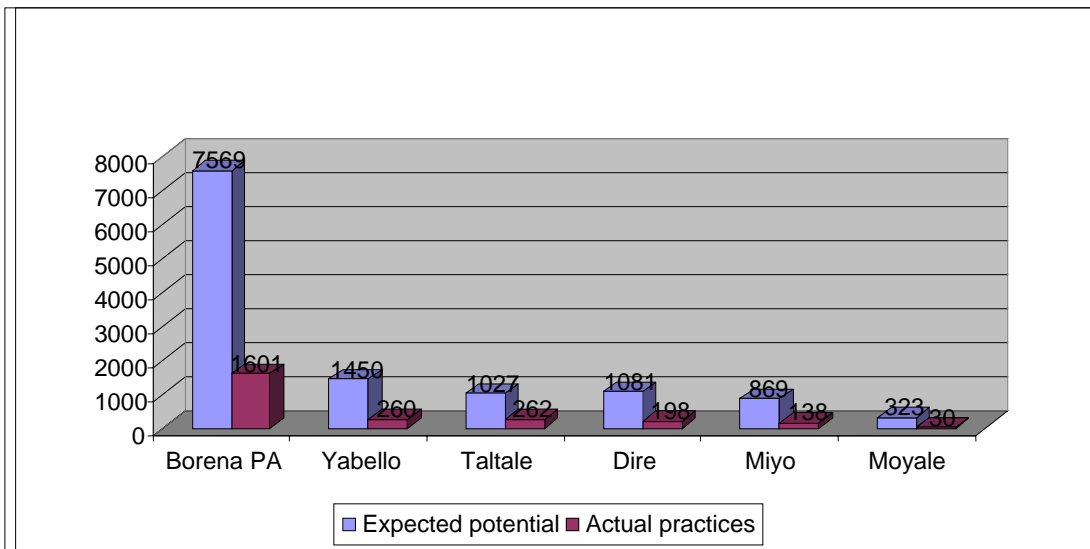


4.2. Milk products

The pastoralists and agro-pastoralists of the Borena zone have been doing a traditional milk processing practices at the household level and produces butter, skimmed milk, yoghurt and Ayib particularly from cow's milk. Borana pastoralists produce milk products like butter to cope the problem of short shelf life of fresh milk. This is because the fresh milk will not stay fresh in some areas even until they reach to the market hence they are forced to process it to butter to cope with the risk of Perishability. The study revealed that the more the pastoralists are far from the market they tend to process the milk and produce butter. Moreover the higher the wealth (livestock) the pastoralists have the higher will be the intensity and size of milk processed and changed into different milk products.

According to the FGD with the pastoralists and women milk processing cooperatives, the proportion of the skimmed milk production from the whole milk is ranged from 70% to 80 % with an average of 75% where, yoghurt production is on average estimated to about 25% of the total processed whole milk values. It was also learnt that that 1kg of butter will also be produced from 8-12litters of whole milk (depending on the season- in wet season takes 12 litre and in dry season 8 litres). Hence on the average 10 litters whole milk is considered to produce 1 kg of butter. Above all it is apparent that the proportion of the butter product per unit of whole milk varies based on the breed type, parity, milking management and feed types. Accordingly, the calculated values of expected skim milk, Yoghurt and butter production of the Borena pastoral areas are estimated to 56,770, 18,923 and 7,569 tons, respectively. Yabello district is the highest in milk product production and followed by Taltale and Miyo. Moyale is the lowest milk product producer. Figure 13 depicts the total potential and actual butter production in the Borana pastoralists in general and studied woredas in particular.

Figure 12:- Butter production potential and current status in Borena pastoral areas (Ton)



Sources: - Field survey, May, 2009

4.8. Milk and milk Products Marketing in Borena

4.8.1. General features of the open markets

Milk and milk product marketing in Borana pastoral area is done to fulfill their main basic needs require for their livelihood. Food is the most important one. The pastoralists supply fresh milk, butter, Ayib and yoghurt.

Adulteration: Milk and milk products are very susceptible to adulteration. In study area, milk and milk product adulteration increases as the product is moved to market from areas where closer to the pre-urban and urban centers. There is less adulteration at production level. Water is used as substance for milk adulteration and butter of plant fat is used for adulterating butter.

Number of Buyers and sellers in the market: Except in the terminal market, milk sellers are milk producers and are all women and girls. In terminal market like Moyale the majority of the sellers are traders and in terms of sex here also all are girls and women. Buyers are market participants particularly pastoralists who directly on spot consume milk. Other buyers include tea and coffee shop owners, restaurants and hotel owners.

Few intermediaries in the market: It is customary to see many intermediaries in many kinds of products marketing such as livestock, horticulture, grains and etc in Ethiopia. In contrast in milk and milk product marketing there are insignificant numbers of intermediaries in study areas.

Price uniformity across location: One peculiarity we came across in milk and milk product marketing was price uniformity especially for milk across the locations. One of key incentives for trading is product price differential in space and time. Except in Moyale market, price of a cup of milk was 2 Birr (6 Birr per liter) across all sample markets visited. The less number of intermediaries in the market may attribute to constant price across locations.

Packaging /containers: the Borana pastoralists’ supply milk to the market using local materials like *Qabbe and Sorora* and Jerry cans and retail at the market with a cup which has a volume of 300ml. While the Butter is supplied by *Qabbe* and different tins and cups. Generally the milk consumers prefer to buy milk from the local container. The following Table- 4 justifies the situation.

Table 4: Some Features of Milk and Milk product in Market in Borana pastoral Areas

Product type	Container used to supply to market	Container used to sell at the market	Volume of supply	Methods of quality test used by consumer	Consumer preference
Milk	Jerry can, <i>Sorora</i> , <i>Qabee</i>	Cups	Large & predominate other	Smelling, test, visual observation	From Local containers
Yogurt	<i>Sorora</i> , <i>Qabee</i>	Cups	Very small	Smelling, test, visual observation	From Local containers
Butter	Cups, Qabee	Cup, cans	medium	Rub between fingers, visual observation	From Local containers
Ayib	Jerry can	Cups	Very small	Smelling, test, visual observation	From Local containers

Source: Survey results, May 2009

4.8.2. Major milk and milk product markets

There are five major milk and milk products markets were identified in Borana pastoral area. These are Moyale market in Moyale wereda, Haro beke and Elweya in Yabelo, and Dubluk in Dire wereda.

Moyale market

Moyale market is the biggest milk market in the area. The major sources of milk to this market are from Yabello wereda (Surupa and Finchuwa) and in the surrounding kebeles of moyale (Tuka area) wereda. On average a total of 6150 liter of milk enters to the moyale market per day from these markets.

Surupa and Finchuwa sources are the main suppliers of milk to moyale market. There is a permanent Isuzu track which transports milk from Surupa to moyale on daily basis. The main milk supplying kebeles are Dhedech Kufa, Korke Diko, Gotu, Dhedech Dha, Surupa etc. According to the focus group discussion with milk freighters association and information obtained from the transporters, up to 1500 liters of milk is supplied in dry season and up to 4600 liters of milk is during wet season from the area. On the average 3050 liter is supplied on daily basis. Out of the total milk supplied to the local gathering center 2592 liter (85%) is transported to moyale market and the remaining 457.5 liter (15%) milk goes to Yabelo and Bule Hora town each 152.5 liter (5%) , and the remaining 152.5 liter supplied to Burjuji and

Geleba where traditional gold miners residing. Except to the mining centers which is transported at the back of women to all market destinations milk is transported by trucks
Finchuwa is also the main source of milk to moyale market .There is also one Isuzu truck which transports 2500 liter milk (up to 250 Jerry cans with a volume of 10 liter) daily. The milk from both sources reaches to its destination starting from in the after noon between 1pm -2pm. The following pictures depict the collected milk with jerry cans, while it is loading and distribution in moyale. From Surupa and Finchuwa on the average a total of 5550 liters of milk is transported to Moyale market terminal.



Figure 13 Milk distribution to traders and agents at moyale market

Tuka and Bukuluboma sources: these are also the milk source for moyale market. The milk from these sources reaches in the morning. Mudhi ambo, Argene, medo, tuka, dambi and Bokola are major kebeles which supply milk to moyale from Tuka. Per day up to 450-750 litter of milk reach to moyale from each of the sources.



Figure 14 .Milk transportation from kebele to the road side (Tuka) and unloading of milk in moyale

The milk supplied to moyale market is received by traders and distributed to household consumers who consume the milk by mixing it with tea, child feeding and retail it for

neighborhood market. Some of the merchants export the milk to Kenya-Gambo transporting it on their backs.



Figure15 Milk to Gambo- Kenya and the jerry can is returned to the producers in this way

Haro Beke Market

Haro Beke market is a weekly open market located in Yabello zone at the distance of 30 km from Yabello town. Butter is dominantly supplied in Haro beke market as compared to milk and other milk products. However milk is supplied up to 250-300 litres per week by the pastoralists who reside with in the radius of from 15-20 kilometres. *Arera* is also one of the milk product supplied to the market up to 340-450 litre of *Arera* is also supplied to the same market. Most of the milk and *arera* are sold the pastoralists for on spot consumption. However, some of the *Arera* is sold to traders who came from Yabello town. They retail it in the street of the Yabelo town to the street children and any other person who wants on spot and house hold consumption (see the picture).



Figure 16Arera Market in Yableo Street and whole milk selling at Haro beke market

The main sources of butter are Surupa, Finchuwa, Dida rafa, and Dida hara, Harbor, Tulawayu and Elweya. Pastoralists themselves and local butter collectors are flooding the butter market. Merchants from Bule hora (6), Yabello (12), Finchuwa (6) and Kercha (2) are entering to the market to buy butter. They are totally 26 in number out of which 16 are women and the remaining are men.



Figure 17 Butter market in Haro beke the pastoralist and the local collector

The price of butter is determined mostly by the number of merchants enter to the market. The more merchants enter the higher will be the price. Besides milk products, milk is also supplied to the market

Dubluk and Elweya markets

Dubluk is found in Dire wereda while Elweya is in Yabelo Wereda. Both are weekly markets and both dominantly supply milk in the market than milk products. Pastoralists from Yabelo, Miyo found at the radius of 15-25 kilometers are supply the milk. Dubluk is known by its livestock marketing. According to the assessment made in the milk market during the market day up to 300 liters of milk is supplied weekly. Though Elweya is located in Yabelo wereda, it is particularly serving as milk and milk products out let for pastoralists in Telltale wereda as well. It is learnt from the FGD with the pastoralists up to 250 Qaabe of milk is arriving in Elweya weekly which is relatively equivalent to 500 liter.

The following table summarizes the characteristics of the markets discussed above. The estimated volume of milk supply to markets is subject to change owing to the season, prevailing weather condition, food and security status in pastoral areas. Actual milk supply drastically drops in dry season (December, January and February). Cow milk supply to market reaches peak in wet season (March, April and May). The supply of milk products is also goes in line with the milk supply.

Table 5: Major Milk Markets and Estimated Volume of Milk supply

Destination market	Major Supply sources	Estimated volume milk supply at a time (lt)	Frequency the market is held	Major suppliers in the market
Moyale	Tuka, Boku luboma, Surupa and Finchuwa	5692	daily	traders
Dubluk	Surrounding villages @10-25 km radius	250-350	Ones per week*	pastoralists
Haro beke	Surrounding villages @10-25 km radius	250-300	Ones per week*	pastoralists
Elweya	Surrounding villages @8-30 km radius	450-500	Ones per week*	pastoralists
Birindar		70-80	Every day**	pastoralists

*=Small amount is daily supplied for permanent residents and some tea shop owners

** =sold to drivers and travelers crossing the village and few resident permanently living there

Characteristics of Price in the markets

The other characteristics of the markets are the season of the year is the one which dictate the price for both milk and milk byproducts. Milk demand surpasses supply in dry period in all areas. However, in wet season milk supply exceeds demand. The variation in price of milk between the wet and dry season is good indicator to show the gap between demand and supply in Borena pastoral areas. Except in Moyale market price is uniform across all markets for a given product.

Table 6: Price of milk in dry and wet season for selected markets in Borena

Milk and Milk product	Unit	Price at sample markets			
		Moyale	Dubluk	Haro beke	Elweya
Wet season					
Milk	Lt	7.5	6	6	6
Arera	Lt	4.5	3	3	3
Butter	Kg	70	65	65	65
Dry Season					
Milk	Lt	10.50	9	9	9
Arera	Lt	7	6	6	6
Butter	Kg	80	75	75	75

4.9. Women and milk marketing

Milk and milk product marketing is entirely done by the women in Borena pastoral area. Not only milk and milk product marketing but also management of these products at home is

exclusively the responsibility of women. Focus group discussion held with men pastoralists revealed that it is even taboo for a Borena man to ask how his partner allocates milk and milk product in the household. How much to use at home and to sell out and for what purpose to use the proceeds from milk and milk product is the sole responsibility of the women in Borana pastoral areas. Women have exclusive decision power on milk and milk product related activities. All milk traders in Moyale markets are women, showing how the all activities related to milk are exclusively left for women. Therefore, improving milk and milk product marketing has great implication in economically empowering women in Borena pastoral areas.

4.10. Challenges and opportunities in milk and milk products marketing

4.10.1. Challenges

The major challenges observed in milk and milk products marketing are:

- High seasonality of milk and milk products production and supply to market
- Easy spoilage of milk due to long distance walk of pastoralists to the market
- Lack of Market outlet for the pastoralists reside at the distant location from the road and the market
- Lack of milk collecting facilities from where the pastoralists move during normal and abnormal mobility
- Lack of marketing and milk quality skills by women
- Weak vertical integration between milk producers and milk processing units and urban consumption centers
- Absence of private pasteurized or UHT milk processing plant in the area
- There is poor feeder rural roads
- Poor quality control systems at milk collecting centers
- Short shelf life of fresh milk
- Lack of market oriented pastoralists organization
- Lack of market for skimmed milk produced by the small-scale milk processors

4.10.2. Opportunities

The major opportunities that need to be exploited for upgrading of milk value chain in Borena pastoral areas are the following:

- High social capital (strong network and trust among milk traders, transporters, pastoralist milk producers)
- Good long term milk consumption habit in the area
- Introduction of information communication technology for instance Mobile (could be used for price information dissemination, direction and location of livestock migration)
- Interventions of PCDP to improve market infrastructure
- Pastoral area received great attention from government
- Many NGOs working in supporting the marketing
- The involvement of women in milk and milk product marketing

5. SMALL SCALE MILK PROCESSING UNITS

5.1. Current status of pastoralists milk processing units

Small scale milk processing units are increasing in the study areas. In all sample woredas visited there is at least one milk processing unit. There were three and two processing units in Yabello and Moyale woredas, respectively. Of seven sample processing units visited five were legally registered at Borena Zone cooperative promotion office. Legal registration helps to get formal trainings and credit from government side. Furthermore, they can sue and be sued as legal person ones obtained legal entity. The number of members of milk processing units varies and ranges from 31 to 95 and the oldest processing unit was five years old. Out of the total 333 members 14 (4.2%) are male and the remaining 96.8% (288) are female (see Table 7).

None of the seven milk processing units own office for conducting regular meeting or other purposes. But three of the processing units have suitable milk processing house constructed from concrete block through the support given by PCDP.

More than 50% of the processing units have a cream separator and complementary equipments. Except one processing unit that was under establishment, all possess milk churner a basic equipment for milk processing. Overall in terms of basic facilities, all have the minimum required facility for milk processing units. However, from our observation they were not as they should be and hence need to be re-vitalized.

The majority of the processing units were initiated by NGOs working in the area with support from wereda cooperative offices. None of the organizations gave full-fledged support for the processing units. The support NGOs gave was of short duration and incomplete in kind. Some simply organize and give initial lump-sum capital without providing sufficient or no training on how to use the resource for future growth. Still some provided only equipments for the processing units. The government support lacks continuous monitoring and follow-up as well as technical backups. NGOs as well as the government offices have not a coordinated support to processing units to enable them how to properly achieve the objectives why they are established.

As some key informant reported that there is road-side bias in establishing milk processing units. The entire sample processing units are located along Ethio-kenya highway. There is a need to establish processing unit off-main road where there is relatively better milk supply.

Table 7. Current Status of Sample Processing in Borena Pastoral Area

S.N	Name of the unit	Location		Number of Member			Years since established	Organization supporting	Own Suitable processing unit	Dividend paid to members
		Wereda	Village	F	M	Total				
1	Burka Jirenga	Yabello	Elweya	48	11	59	0.25	Wereda Coop.	No	None
2	Hormata	Yabello	Birindar	46	0	46	4	CARE	No	None
3	Elwake	Dire	Dubluk			31	3	LVIA, AFD, PCDP	Yes	None
4	Bukuluboma	Miyo	Boku.	30	0	30	5	LVIA	Yes	None
5	Surupa	Yabello	Surupa	29	3	32	4	PCDP	Yes	None
6	Oda-Kufa	Moyale	Tilemado	95	0	95	4	PARIMA, coop.	Yes	None
7	Negegna	Moyale	Tuka	40	0	40	5	LVIA, coop.	No	None

NF=Not functional during the survey

5.2. Socio- economic benefits of small-scale milk processing units

On the basis of pure business sense, none of the processing units visited were making any profit. Even worst they are performing at loss if the opportunity costs of members' labor, time and milk contribution is taken into account. However, the establishments of milk processing units have other implicit socioeconomic advantages. The major socioeconomic advantages of milk processing units are described as follows.

5.2.1. Saving and credit

Formal microfinance institutions are absent in most pastoral areas in general and Borena pastoral area in particular. Because of this most of the processing units besides processing milk they play saving and credit institution's role. The milk processing group members save some amount of money on a weekly basis. When members faced cash shortage or hard-time they borrow the required amount of money from the saving and credit account of the group. Non-members can also borrow from the saving and credit account of processing units when they faced serious hard-time³. Such is a common event in pastoral area as reported during group discussion held with members of processing units. The processing units have saved a lot of life and alleviated problems of the community though they have limited capacity and resources.

5.2.2. An entry point to economically empower women

³ During the FGD with the members told that one pregnant woman who was not a member and who was facing problem in giving birth was saved her life by giving her credit and went to hospital gave birth safely

Though processing units are not currently generating profit from their undertakings, the processing activity can serve as an entry point to economically empower women in the long run. They could be guided to engage in other activities like making and marketing of handcrafts, petty trading, and shoat marketing. Moreover, in the process they are acquainting how they can work in group and influence different organization and government offices.

5.3. Performance of Milk Processing Units

Information on the current performance of milk processing unit is very crucial to draw lessons and give recommendations having strategic significance for improvement of the processing units in future and/or for scaling-up as deemed necessary. Maximum duration of operation in a year, volume of milk daily or weekly processed per processing unit, profit they generate and status of operation were used as proxy indicators for assessing the performance of processing units in Borana pastoral area(see Table 8).

Table 8: Performance of Milk Processing Units

Sample Milk Processing unit	Max duration of operation (months)	Volume of milk daily(lt)	Volume of butter(kg)	Operate at profit/Loss	Status during survey
Hormata	2	14.3	1	loss	NO
Bukuluboma	3	40	3.5	loss	NO
Negegna	3	30.5	1.4	loss	NO

Source: Computed from data obtained during FGD May, 2009

NO= Non Operational

As indicated on Table 7, the processing units operate for a maximum of three months in a year. In the remaining months they remain idle because of shortage of milk, discouraged by lack of market for skimmed milk. One can imagine how hardly possible to generate profit working only for such short period in a year. The volume of milk they process is also extremely low given the number of members in the group. The maximum amount of milk they collect and process at peak season of operation was 40 liters and can go as low as 14 liters for some units. The amount of butter they extracted from milk per single processing period was also low as low as 1kg for some units. They also reported that they process milk 2 or 3 times per week due to small volume collected from members. When this data was collected milk production was relatively good in many areas. Yet none of the processing units were operational. All sample processing units indicated on Table 7above operate at loss. During discussion made with executive members of the processing unit it seems that none of the units have realized they are performing at loss. What obscured whether they are performing at loss or profit was members' milk contribution in kind and the role that the units play as credit institution. Had the processing unit paid in cash for milk contributed by members, they would have immediately realized they are doing the business at loss. But in real cost benefit analysis the opportunity cost of milk contributed by members should be taken into account and when that is counted they are all operating at loss.

By all performance measures set, the performance of processing units is unsatisfactory at current state and they have to receive technical backup and reoriented and/ or redirected to business and marketing entity.

5.4. Viability of the milk processing units

The major factors affecting the viability of milk processing units includes Input supply, facilities, output market, profit and technical capacity.

5.4.1. Input supply: Milk

The basic raw material for the processing units is milk. The sources of this raw material are two. One is from members' contribution and the other is purchase from producers living in their operation area. From the member side all members have to supply the agreed amount of milk to the processing unit. Here they faced two big problems. One is the units could not immediately pay in cash to the members at the spot of delivery. They rather promise to pay after the milk is processed and sold in the future from the profit they make if any. But members (particularly from the poor household) have immediate cash need for their household consumption as other alternative sources of income are very rare in the area. Hence the members have no incentive to supply milk to the units on a credit basis.

The other problem from member side is not all members have milking cows but non-cow owners also are forced to deliver the agreed amount of milk to milk processing units regularly. The option that the non-cow owner members have is to buy from market and supply their share to the processing units. Such members face one critical problem which is cash shortage. They will not get cash when they are in need- of it and hence face a problem of fulfilling their obligation.

5.4.2. Milk quality

Milk required for processing should be of better quality in butter content. But milk pooled together by processing units from members varies in quality and fat/ butter content. This is because some members contribute milk buying from the market which is difficult to control its quality. Even members who own cow do not usually supply best quality milk, as they do not get cash right away .Hence they sell the quality milk in the market to get more cash immediately and see supplying the low quality milk to the processing unit for credit as an option. The variability in milk quality supplied to processing units has great impact on butter yield obtained eventually. The lower the milk quality in terms of fat content, the lower the butter yield obtained and the less will be the profit obtained by processing units. Variability in quality and fat content of milk supplied to processing units negatively affected their profitability thereby their viability in the future. In some cases particularly in dry seasons adulteration with water decrease the quality in terms of fat content.

5.4.3. Seasonality of Milk Supply

Milk processing units were reported that they operate for a maximum of three months in a year. The major reason for this is seasonality of milk production in the area. They get sufficient milk only in months of March, April and May under normal weather conditions. In other extreme in months like December, January and February milk production drastically drops and will not be available for consumption leave alone for processing. Therefore,

seasonality of milk supply is posing great challenge on the viability of milk processing units in Borana pastoral areas.

5.4.4. Facilities and Equipments

Processing units require certain basic equipments to be viable and properly function. Some of these basic equipments include milk churner, cream separator, milk containers like stainless still bucket, lactometer and etc. In terms of the basic facilities mentioned above, all sample processing units are relatively in better position. But the majority do not have suitable house for office and storage of equipments/materials. One of them is also pay a monthly rent for the processing unit.

5.5. Business and Marketing skill

Like any other venture, milk processing activity needs a business and marketing skills to be viable and generate benefit for the owners/members. However, from our observation and focus group discussion made with executive committee members, all processing units lack milk and milk product business and marketing skill. From business side they all do not have business plan for their operation, most of them do not register accounts. From the marketing side they do not know when to process, what time and where to sell, pricing of their product (for instance butter was sold at same price throughout the year while purchase price of milk was variable).Lack of business and marketing skill limited the processing units to exploits opportunities of high price for their products like butter which has long shelf life.

5.6. Profitability

Profit is prime motive for the establishment of most private business. For the business to exist, grow and be viable in the future it must make profit. The same holds true for the processing units. They must make profit to be sustainable in the long run. Therefore, it is of paramount importance to see the profitability of processing units so to shape and or orient them in the right direction. Simple gross margin analysis was conducted for sample processing unit to get some picture on their profitability. The results revealed that if opportunity cost of members labor, time and milk contributions are taken into account all are operating at loss.

Taking the opportunity cost of members' milk contribution out of the equation, of four sample processing units considered only one processing unit got small amount of profit. Out of the four processing units three of them exhibits negative SGM which indicates on each of the birr these units are invested on the business get back loss amounting the negative SGMs in the following table. All the data (price and quantity) was collected from the processing units during FGD.

Table 9: Profitability of Milk Processing Units

Sample unit	Processing	Items	Quantity	Unit price(Birr)	Total
		Cost			
Elweya		Milk(lt)	33.3	6	200.0
		Total Cost			200.0
		Income			
		Butter (kg)	5	68	340
		Skimmed milk (lt)	26.7	1.5	40.0
		Total Income			380
		Gross Profit			180.0
		SGM			47%
		Cost			
Hormata		Milk(lt)	14.3	6	86.0
Milk processing		Total Cost			86.0
Cooperative		Income			
		butter(kg)	0.5	68	34
		Skimmed milk(lt)	13.3	1.5	20.0
		Total Income			54
		Gross Profit			(32.0)
		SGM			(59.2%)
Bukuluboma		Cost			
Milk processing		Milk(lt)	40	6	240
Cooperative/unit		Total Cost			240
		Income			0
		Butter(kg)	3.5	55	192.5
		Ayib(kg)	5	6	30
		Total Income			222.5
		Gross Profit			(17.5)
		SGM			(7.8%)
Negegna		Cost			
Cooperative		Milk(lt)	213.3	7.5	1,600.0
		Total cost			1,600.0
		Income			
		Butter(kg)	10.0	60	600.0
		Skimmed Milk (lt)	126.7	3	380.0
		Total Income			980.0
		Gross Profit			(620.0)
		SGM			(63.2%)

Source: Computed from field survey, May 2009

5.7. Technical Support

Milk processing activity requires special attention due to the nature of the product it involves. Milk and milk products are very perishable. Dealing with perishable products such as milk needs great care starting from milk collection up until the product reaches in the hands of consumers. Besides the nature of the product, some technical skill to manage group and resources, deal with market and group dynamics, entrepreneurship skill and optimizing on available resources is badly required for the processing units to be viable and autonomous business entities eventually. These basic skills are all missing from the management body and/or members of processing units. None of the organizations supporting the units have fully provided these basic skills in a continuous and coordinated way. Lack of such basic technical skill is what jeopardizes the viability of processing units in Borena pastoral areas. Therefore, there is a need by all concerned development partners to pool their efforts together and make these few processing units economically viable through provision of full-fledged technical back-ups.

5.8. Opportunities and Challenges

5.8.1. Challenges

- Lack of market (buyer) for cream separated milk (skimmed milk)
- Quick spoilage of milk due to hot environment of the area;
- Seasonality of milk supply—excess supply in months such as March, April and May; extremely low/none supply in months such as December, January and February; Moderate supply in the remaining months;
- Great variability in wealth among members forming milk processing group/cooperatives some own milking cows others do not;
- Lack of marketing and business skill of milk processing unit members;
- Group dynamics (lack of group management skill, leadership, numeracy skill);
- Lack of incentives for executive committee members;
- Lack of suitable processing houses

5.8.2. Opportunities

- High social capital (networks of relationships among women producers, women traders, transporters very strong)
- Pastoralist culture of keeping more female animals (60-70% of the herd) in Borena pastoral areas
- Good practice of forming informal milk producer and marketing groups within villages
- Good government emphasis for pastoral areas in recent years
- Big potential water sources being developed by Oromia regional states in Borana pastoral areas
- Many NGOs and government offices working in the area

6. MILK AND MILK PRODUCTS VALUE CHAIN ANALYSIS

6.1. Overview of the value chain

The value chain of the milk and milk products of in Borana pastoralists involves six distinct value adding activities from the production of the milk through reaching to the final consumer in the market. These activities include input supply; production; gathering (bulking); processing; transportation; and retail trading.

This part of the paper identifies the actors involved in each of these segments of the chain and their interrelationships with other players; the value they add to the product; and the constraints and opportunities they face. In the course of analyzing this section enable to identify the type of interventions required at each chain segment which in turn, if addressed well will create smooth flow of the products and information along the chain eventually increases the competitiveness of the overall chain. Each of the segments of the activities is discussed separately and gets into to the analysis of the actors, the process through which the chain functions are embarked on, and finalizing with a presentation of constraints, opportunities and possible interventions required.

6.2 Production

Production is the basic segment for any value chain analysis and it is the pivotal point where makes the value chain to develop and attain competitiveness. The improvement made in this level of the chain could have a significant implication in enhancing competitiveness in all other levels of the chain. It holds true particularly for agricultural value chains in general and milk and milk products in particular. It is apparent that this paper deals with on the analysis of milk and milk products VC in Borana pastoralists where their livelihood and the lion's share of the household income comes from the production of the mentioned products and hence it will be given a due attention for the analysis of the production part.

6.2.1 Producers (pastoralists)

These are the basis of the milk and milk products value chain. They have two major functions. One is livestock management so that production and productivity of livestock increases or at least maintained at current levels. Borana pastorals have long term experience of properly managing livestock for getting better milk yield and reproduction year in year out. A good indication to this is they keep 60-70% of the herd as female animals. The pastoralists produce and sell milk through the systems indicated in section 4 of this paper to sustain their livelihood.

6.2.2. Milk Production

As it is indicated on section 4.1.1 the total overall average milk produced in Borana Pastoral communities is estimated to be 129,029 tons of cow, camel and shoats milk. On a daily basis it is 353,504 litres. Of these cow's milk constitutes 69,864 tons camel milk 58,016 tons and shoa milk 1,149 tons. The total average value of the milk produced in Borana pastoralist is

Birr 588,278,000⁴. The cow's milk contributed 59.4% which is Birr 349,320,000 and camel milk contributed to 39.4% (Birr 232,064,000) and the remaining balance 31.2% (6,894,000) is the share of the shoats' milk. For this value chain analysis purpose only the cow milk is taken in account.

6.2.3. Milk utilization

In this part milk utilization of milk is considered only the milk which is milked by pastoralists for different uses. The milk consumed by calves here is not considered

Milk is used as the main family diet and income sources. It is also used as the main income generation sources for the women pastoralists. As indicated on the PADS (2005), milk and milk products take the shares of 45% and 24% of the livestock products and over all the annual pastoral household income generation sources, respectively.

Among the Borena pastoralist milk is mainly used for household consumption for family daily food, supplied to the market and in turn purchasing of grains, clothes, salt, sugar, tea etc and given to relatives and neighbours who do not have or/ less milking animals. Insignificant amount of milk is also given to guests and travellers who asked the pastoralists water to drink⁵.

In general the proportion of household milk utilization is largely depends on different variables. Among others accessibility of pastoralists to market, the numbers of milking animal, the amount of milk production volume and the number of neighbours and relatives that have less milking animals. It is also learnt that seasonal and yearly climate fluctuations also influence the proportion of household milk utilizations.

Based on the field assessment results, it was found that the average milk utilization rate for Borena pastoral areas is estimated at 31%⁶ (21654.8 ton) for home consumption 14 % (9780.9 ton)for social gift, 44% (30740.16 ton) for market supply and 11 % (7685.04 ton)for home processing to produce butter.

The proportion of household milk utilization in each of the study woredas is also analysed .Accordingly; the utilization rates for different purposes in Yabello, Dire and Miyo woredas almost are the same. It is calculated to be 30%, 10 %, 50% and 10% for home consumption, social gift, marketed and home processing respectively. In Moyale the proportion is slightly varies from the three pastoral woredas due to accessibility to Kenyan milk market and the household milk utilization ratio is estimated at about 27% for home consumption, 8 % for social gift, 60% for market supply and 5% for processing. However, in Taltale since the accessibility of pastoralists to the market is very limited, the milk utilization trend is completely different from other woredas. For that reason, the household milk utilization

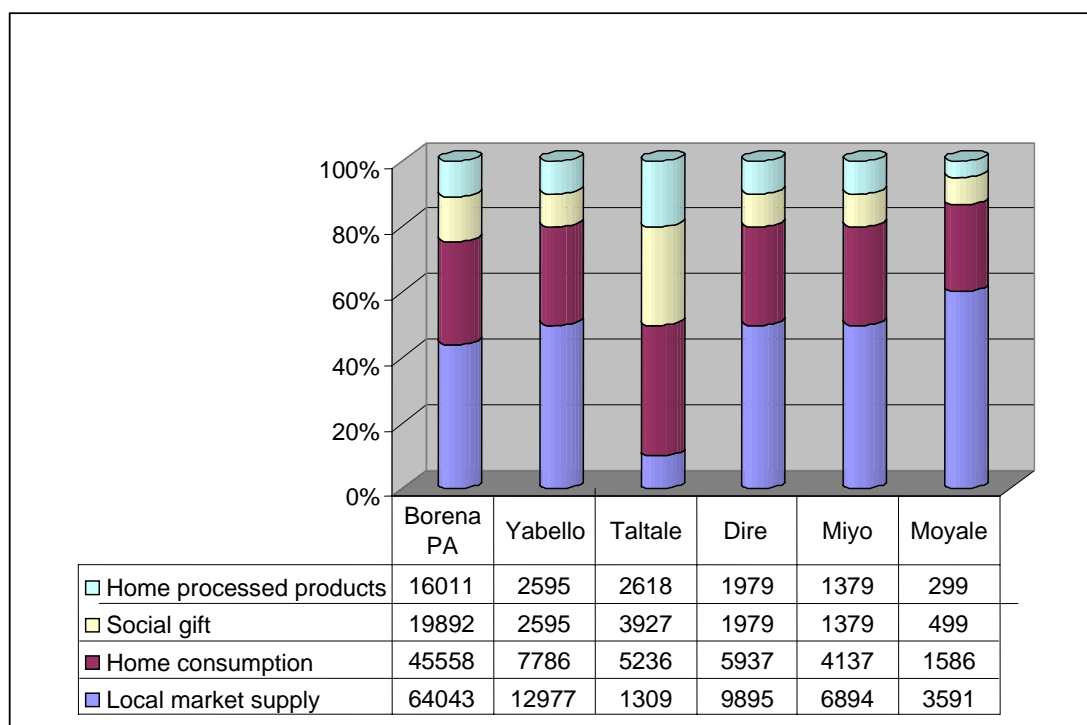
⁴ The price for the cow and camel milk is calculated based on average prices of the wet and dry seasons. Accordingly Birr 5/liter and Birr 4/liter are taken for cow and camel milk respectively. However though the shoats milk is not supplied to the market for the sake of valuation Birr 6/liter is taken

⁵ Traditionally the Borena pastoralists are not giving pure water for any persons who asked water for drinking but when there is more milk in the house they provide milk and when there is less milk they provide by mixing it with water.

⁶ The percentages are the averages of the proportions of different milk usages obtained from the FGD discussion made with the pastoralists and women groups in the five woredas.

proportion in Teltale is calculated to be 40% for home consumption, 30 % for social gift, 10% for market supply and 20% for processing. The following figure depicts the milk utilization situation.

Figure 18:- Household milk utilization rate in Borena pastoral areas



Sources: Computed from Zone and District Pastoral Development Office, 2000 E.C

6.2.4. Production cost and Gross margin for cattle and milk production⁷

Table 9 presents information provided by pastoralists during the FGD and key informants during the field visit. The table presents the cost-benefit analysis of rearing cattle and producing milk per milk cow and milk per liter and specific gross margins. The analysis done based on the wealth ranking of the pastoralists groups⁸ and the average herd is taken for each of the groups. Moreover the table also depicts the specific gross margin that different wealth group pastoralists earn from rearing cattle and producing milk. For the production of cattle the analysis came up with, the pastoralists invest 3.6% of the cost on feed and minerals, veterinary services 24.7%, herding services and self defense 64.8%, marketing cost 2.1%, and miscellaneous (management, labor for milking) costs 4.8%.

The average annual cost / head of cattle is found to be Birr 59.69. The poor spend Birr 114.02, the middle 91.49, the rich 91.11 and the very rich Birr 52.48. The poor spend more per unit cost as compared to his higher wealth groups. Of course this is the issue of the economies of scale –when the size of the heard increase the unit cost decreases. Conversely

⁷ The results of the margins and profits depicted on table 9 are at normal conditions facing the pastoralists-when ever there is a drought shock beyond control it will be completely changed. However the milk production and costs are averaged from the drought and wet season scenario.

⁸ See section 3.4.2. of this paper

the poor also have low the gross margins as compared to the others. For every Birr he put in rearing cattle he only gets an additional 16.91% back in the form of margin. The figure for middle category is 42.24%, for rich and very rich is 36.94% and 61.25% respectively.

With regard to milk production the average cost invested per unit of milking cow is calculated to be Birr 84.3. this figure is found to be higher as compared to other cattle is because the pastoralists invest more money, labor feed (concentrate during drought season) and management than others. Hence it is estimated that the pastoralists incur up to 20% more cost than the other cattle types he have.

The poor groups of pastoralists also produce litter of milk at higher cost than the other wealth groups are doing. He pay out Birr 0.79 to produce a litter of milk, while the middle category spend Birr 0.59, the rich and the very rich also spend Birr 0.41 and 0.45 respectively. Accordingly the gross margin from the milk production for the wealth groups is calculated to be 64.27% for the poor, 73.05% for the middle and 72.05% for the rich. However for the very rich it is found to be higher and is 81.24%.

Table 10: Production cost and SGM for cattle and milk production at different wealth status

	Description	Poor	Middle	Rich	Very Rich	Total	Average /cattle
1	Revenue estimation						
1.1.	Herd size	3	15	37	250	305	
1.2.	No of milking cow ⁹	0.69	4	9	57	71	
1.3.	Milk production lit /day	1.04	6	13.5	85.5	106.5	1.5
1.4.	Annual Milk production (liter)	187.2	1080	2430	15390	19170	
1.5.	Home use	0.47	2.70	6.08	38.48	47.93	0.6
1.6.	Market supply	0.57	3.30	7.43	47.03	58.58	0.82
1.7.	Farm gate selling price (birr)	4.00	4.00	4.00	4.00		
1.8.	Total daily revenue	2.29	13.20	29.70	188.10	233.29	4.12
1.9.	Revenue per liter	2.20	2.20	2.20	2.20		
1.10.	Annual Revenue (Birr)	411.84	2,376.00	5,346.00	33,858.00	41,991.84	742.50
2	Costs (year)¹⁰						
2.1.	Feed and minerals	125	420	840	2407	3,792.00	0.56
2.2.	Traditional & modern Veterinary services	44.50	228.60	597.90	2,119.00	2,990.00	9.80
2.3.	Herding Services	86.70	464.60	1,438.00	5,309.00	7,298.30	23.93
2.4.	Marketing Cost	25.89	63.90	96.20	342.00	527.99	1.73
2.5.	Herding and self defense	43.70	92.30	167.86	1,768.00	2,071.86	6.79
2.6.	Management and other labor cost	16.40	103.00	231.17	1,175.00	1,525.57	5.00
2.7.	Annual Direct cost for cattle production(Birr)	342.19	1,372.40	3,371.13	13,120.00	18,205.72	59.69
	Specific Gross profit for cattle production	69.65	1,003.60	1,974.87	20,738.00		
	Specific Gross Margin for cattle production (%)	16.91	42.24	36.94	61.25		
	Cost for milking cows (2.7/1.1.*1.2.)	78.70	365.90	820.00	3,726.08	4,990.68	
	Additional Cost to manage Milking cow (20% *2.7)	15.74	73.18	164	745.21	998.14	
	Total Cost for milk production or for milking cows	94.44	439.08	984	4,471.29	5988.82	84.3
	Cost of milk production per liter (birr)	0.79	0.59	0.61	0.41	0.45	
	Specific Gross Profit for milk per liter	1.41	1.61	1.59	1.79		
	Specific Gross Margin for milk per liter	64.27	73.05	72.05	81.24		

Source: Computation from field survey May 2009

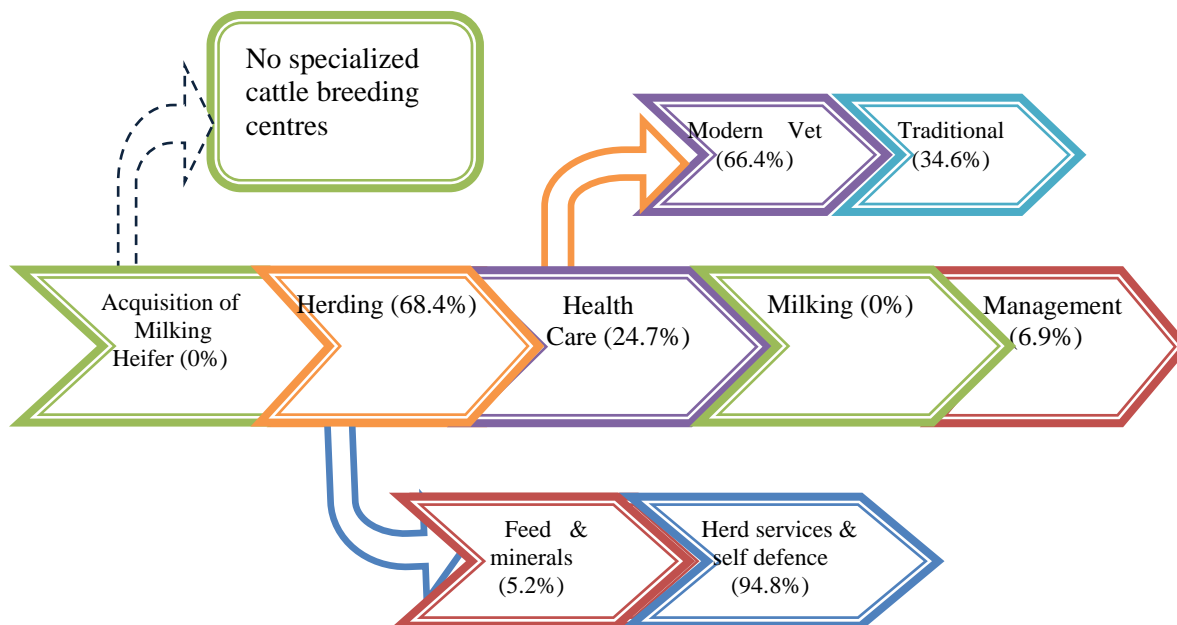
6.2.4. Cattle Milk production value chain

⁹ Refer section 4.1.1. of this paper

¹⁰ Cost (Birr) per TLU (5 cattle) is calculated. The calculation is based on the survey on Borana Sample Holding conducted by Solomon Desta, 1996-97. He categorized the cost components into six and proportionate share of the cost to the category. For this analysis case value adjustment is done as of 2009 considering the current inflation rate and the devaluation of the purchasing power of Birr against USD as compared to the year 1996. The exchange rate is 1USD=11.302.

The milk production value chain at the level of pastoralists' is divided into four main value adding activities these are: acquisition of milking cow heifers through rising of young female calves¹¹ ,herding (pasturing, feeding and herd services and self defense), health care (traditional and modern), and milking . The information obtained in table 9 is summarized under the following map.

Figure 19 Milk production Value chain at the pastoralists level



6.2.5. Milk Production constraints and opportunities

6.2.5.1. The constraints

The milk production constraints in Borana pastoral communities are several. These are generally categorized into natural, social, economical and institutional factors. These factors affect efficiency of the animals to convert the inputs into outputs commonly referred to us productivity.

Seasonal variability in feeding and nutrition: Feed shortage is one of critical factors affecting milk production and productivity in the areas. This problem is caused by the shrinkage of rangeland due to over grazing, bush encroachment and the population increment which ultimately resulted to the shortage of grazing land. The deterioration of the indigenous knowledge for natural rangeland conservation and lack of knowledge and capacity¹² to avail

¹¹ Here the assumption is the pastoralists will raise heifer from their own female calves because in Borana they have a tradition to maximize the size of female cows than male. Hence the cost for raising calves is included in the herding.

¹² Particularly the poor could not have a capacity to purchase concentrates during the dry season to maintain the body of the milking cow.

supplementary feeding practices exacerbates the problem and the amount of feed available for the livestock is not sufficient to maximize production and even in most of the cases it is not sufficient to maintain livestock. The following were identified as problems in animal feeding:

- bush encroachment and weed infestation;
- uncontrolled bush fires;
- termite activity;
- overgrazing;
- poor quality and quantity of dry season forage;
- poor utilization of crop residues (from the agro pastoralists);
- lack of inputs for pasture improvement;
- poor delivery of support and extension services;

Water shortage: water is the basic element for milk production. The problem is mostly persistent during the dry seasons. In this season the pastoralists are forced to travel very long distance (6-12 hrs/day) to access water for their livestock. The water harvesting practice in the areas is not yet developed to cope with the problem. Further more, the shortage of water is highly aggravated by prolonged dry seasons and recurrent drought. The traditional livestock watering systems which are done at every two days during wet seasons and every three days during dry season for cattle cannot sufficiently address the production of milk in the areas.

Limited extension services and technical support: Extension systems that geared the pastoralist to wards market oriented livestock and milk production are not well established in the areas. Thus, milk production systems among the Borena pastoral communities are practiced under traditional livestock management and husbandry systems and it led the pastoralists to produce less production with lower productivity of litre per animal. The business orientation has to be introduced. This is an area that needs to be properly addressed through appropriate training using farm budget approaches for the pastoralists to see where they are losing value in the chain.

Prevalence of livestock Diseases: Prevalence of major livestock diseases, limitations in veterinary services and disease control are the major constraints of milk production in pastoral areas. Among the livestock diseases that are affecting milk production and productivity are FMD, Mastitis, CBPP, tick and tick-borne diseases, milk fever (hypocalcaemia), Trypanosomiasis (Taltale and Northern west Yabello), Back legs and etc are the prominent ones. The feeding habit is directly related to the resistance of the animal to disease. The poorly fed animals develop low disease resistance, faces fertility problem. Among others the high cost of veterinary drugs and accessibility also affected the pastoralists. The diseases could be manifested in the following manners: At the input level it destroys the basic livestock production process through mortality of breeding of productive animals. Disease lowers the efficiency of the production process and the productivity of resources employed-through reduced feed conservation consequently diseases reduce the quantity of milk produced. The following are the main problems the identified:

- High incidence of vector-borne and parasitic diseases;

- Inadequate supply of vaccines for economically important diseases;
- Inadequate delivery and lack of affordability of veterinary services;
- Inadequate control of the use of veterinary products.

All these factors impact negatively on quality control of milk and milk products.

Breeding factors: *the* pastoralists categorize the milking cow breeds into two namely: *mirgisa/waticha* and *Baku* based on the amount of milk they produce. *Mirgisa/ waticha* are animals which are high yielding milking cow groups and *Baku's* are the relatively low milk yielding cows. During the survey the pastoralist FGD groups indicated that the *Mirgisa/ waticha* type breed are getting decreasing at decreasing rate. These animals are highly susceptible to environmental stresses like drought, diseases out break etc as compared to low milk producers. The pastoralists and other key informants from pastoral areas pointed out that high milk yielding animals had been the dominant among herd groups 40 years ago; however, currently the herd proportion dominated low milk yielders. This contributes a negative impact on milk production status of the Borena. The reduction of high milk producing groups with in the total herd is mostly caused due to weakness of traditional breeding systems, uncontrolled genetic dilution problems and high animal mortality rates resulted from environmental, recurrent drought and diseases out break stresses.

Policy issues

- No specific policy on pastoral dairy development issues

As it has been indicated under policy framework, to our Knowledge the country so far has no any dairy specific policy. The existing dairy development project also focuses on the highland areas. Increasing milk production is a best means to ensure food security in pastoral area. Therefore, there is utmost urgent need to devise dairy development policy suitable for pastoral areas.

- Lack of organized cross boarder (Ethio-kenya) business of milk and other products. Particularly focus should given to the establishment of formal exchange rate sites
- An Incentive Mechanism for Private Investment in Medium to large scale milk processing and packing plant in pastoral areas: there is no a special packages of incentives for private sector who engage in milk processing industry in the pastoral areas

Milk quality problem: though currently customers demand only for the fermentation of the milk, generally the milk produced in Borana pastoral area has a quality problem. If the milk processing is introduced there the quality of the milk has to be improved

6.2.5.2. Opportunities

Among others the following are the opportunities identified for milk production in Borana pastoral community.

The indigenous knowledge in livestock holding: The pastoral communities in Borena are well experienced in handling livestock resource and have a well developed herd management

system. The indigenous knowledge and experience of pastoralists favored sustainable milk production.

High involvement of pastoral women in milk production: the involvement of pastoralist woman in managing the herd at household level and taking care of the milking cows, milk and milk products have increased the decision making power of the pastoral women and which in turn is an asset in improving the livelihood of the pastoral women .

Pastoral development policy and strategies: this day the Federal and Regional governments pay due attention for the improvement of the pastoral livelihood. The pastoral areas development policy and strategies formulated to address the problems in pastoral system in general and the development of milk production in particular. The on-going huge water development investments project in Borena and formulation of pastoral extension package by Oromia Regional state will contribute something to improve the milk production in the areas.

Existence pastoral development actors: the presence of different NGOs that are working in improving the livelihood of the pastoral communities is also be an asset to improve the milk production which generates the lion's share of the house hold income of the pastoral communities.

6.3. Milk assembly and transportation chain

Unlike other areas in the Borana pastoral community the producers them selves engage in milk trade with their corresponding relatives and or mamilas(clients) reside in terminal market like moyale. The role that small milk traders play at assembly sites is insignificant hence the role that the pastoralists play in the assembly chain is considered and analyzed. Moreover, though there are many pre-urban milk markets for its high market share the moyale market is taken as terminal market and the assembly channels that spur to this market are also considered.

6.3.1 Milk Assembly

The pastoralists from different pastoral villages so called *Olla* supply their milk to the peri-urban areas which are the primary markets where milk and milk products collection is started the bulked and supplied to secondary and terminal marketing. In the most of the studied areas, the producer pastoralists who reside in the encampments near by peri-urban and village towns often take the advantage of milk collection and bulking being a collector and a trader.

In the study Woredas, the pastoral women groups are involved in collection and bulking fresh and sour milk at *Olla* (village) levels for market supply in peri-urban areas. Traditionally, women pastoralists are organized them selves at village level and collect and bulk milk from the households in the villages. In each village members of pastoral women's group daily contribute milk to the group based on the individual interest, production and contribution capacity. The activity of collection and bulking is done on daily basis and the all members are obliged to be involved by turn. Milk collected and bulked is supplied to the market.

Accordingly, Surupa primary milk marketing is found in Yabello district in northern direction at about 40 Km distance from Yabello town. In the area the major milk producers' are Gabra, Borena and Guji pastoralists. Both cattle and camel milk is collected and bulked. According to the FGD discussion, on daily about 5600 liters of milk is bulked from the vicinity of Surupa area.

Dida Hara and Elwaya are the most important primary milk market and milk collection and bulking centers in Yabello district and situated at 30Km in Eastern and Western direction from Yabello town respectively. The main source of milk supply for Dida Hara and Elweya is estimated to 3 and 7 pastoral association and surround villages, respectively. Haro Bake is also a milk collection and bulking and secondary milk market center of Yabello Woredas that located at a distance of about 15 Km way from Yabello town in the Northern direction. Dida Hara, Elweya and Surupa and the other surrounding pastoral association and Olla (villages) are the major milk suppliers of Haro bake market.



Figure 20: pastoralists arrived at Surupa assembly centre and bulked milk ready to load

Moyale town is the terminal market area for milk from studied pastoral woredas of Borena. The highest volumes of milk is collected, bulked and transported to Moyale. The main suppliers of milk to this terminal market are Surupa and Finchuwa Boku luboma and Tuka. Out of the total 7275 liter of milk collected and assembled in four main centers about 78.5 % (5292 liter) is transported to Moyale market¹³ .

According to the pastoralists cooperatives consulted for this study, the market price of milk varies with season and the type of milk. On the other hand, the market price of milk is governed by availability of milk and access to market. The gap between market demand and supply also influence market price of milk. In all studied areas, the milk price is relatively high during dry season and decreased during the rainy season. In general, market price for milk in all studied areas both during rainy and dry season ranges from 4.50-9.00 Birr per liter. However, during field visit to the assessment slight variation in milk market price is observed from place to place.

In the process of milk collection and bulking, milk quality testing is considered as one of the most important activities to fulfill the quality demand of the market. There is no scientific

¹³ See 4.8.1 section of this paper.

quality testing methods observed in all studied milk markets. However, traditional quality testing techniques and methods are commonly in use. Milk quality is checked before purchasing by using sensory evaluation including general appearance, taste by tongue, smelling, checking for cleanliness by vision, clot-on-boiling and, etc. Although it is not as such common as sensory testing, the use of match for milk quality testing by collectors is also reported by Kemal Hussein, *et. al.* pastoralists who supply milk to terminal market like moyale clean and fumigate their milk jerry can using water and locally available wood chips to reduce deterioration of milk quality.

6.3.2. Milk Transportation

The milk transportation task in the Borana has two segments. The first involves transferring the milk packed in 5, 10 and 20 liter jerry cans from the production areas to the roadside bulking and collection centers. This is mainly done on the donkey and women backs. The second segment is milk will be transported from collection centers to the terminal market (moyale) traveling up to the distance of 30-240 kilometers. During milk transportation in this segment the producers are not travel with their milk. They sent their milk by the drivers putting unique marks of string tied, color of the containers etc on the jerry can which enables their corresponding client in moyale to easily identify the container. In this segment the activity is done by two transport companies. The first one is Mohammed Amin Transporter- this company has three buses and one Isuzu Truck. The buses are transporting milk from Bukuluboma and Tuka area. Both buses reach moyale in the morning at 9.30-10.30. the morning milk demand of moyale is served by this company. The other is Abdi Boru freighters association. This association has two Isuzu Trucks transporting milk from Finchuwa and Surupa. They reach morale in the after noon at 12:00-2:00pm and serve the afternoon demand.



Figure 21: Clients in Moyale are identifying their jerry cans sent by the producers

The transportation cost per liter is differing for Surupa (240 KMs), Tuka (30 KMs) and Boku Luboma (53 KMs). For Surupa the cost for 10 liter container jerry can to moyale is Birr 4 and for 5litre it is Birr 3. The average cost of transport from Surupa to moyale is Birr 0.46. The cost of 20 liter jerry can from Tuka to moyale is Birr 2, for 10litre it is Birr 1 and for 5 liter it

is Birr 0.50. The average transport cost per liter from Tuka to moyale market is Birr 0.10. For Boku luboma the transportation cost per liter is identified to be Birr 0.18.

A total of 6292 liters of milk is transported to the moyale terminal market from the three main milk supply sources namely Surupa, Bukuluboma and Tuke routes. Surupa and Finchuwa constitute 80.9% shares in this supply. Bukuluboma and Tuke take the share of 7.15% and 11.95% respectively. The average gross margin of the three areas is 35.73%. The pastoralists in Tuke gate more return on the birr they invest on the milk market as compared to other partners in Surupa and Bukuluboma having the margin of 37.7%. This is because they are located at the near distance from the terminal market and hence pay less transport cost per unit of milk product. For Surupa it is 32.9% and for Bukuluboma it is 36.6%. The following table summarizes the situation. Out of the total margin earned by the pastoralists the share of the transport companies is calculated to be 3.28%. The share of the transport companies is relatively low because they drove on asphalt road and hence the cost per unit is low. Besides this the buses also transport passengers along with the milk and hence see the milk as secondary source of income and hence charged minimum price. Moreover the traders (retailers, clients and agents of the pastoralists) also share out of this margin which is calculated to be 16.6%¹⁴.

Table 11: Milk collection, assembly and transportation (Moyale terminal Market) chain analysis

No.	Cost Items	Source to moyale terminal market				Average
		Surupa and Finchuwa	Boku luboma	Tuke	Total	
1	Average volume of milk per day(lt)	5,092	450	750	6,292	2097
2	Monthly volume of milk	152,760	13,500	22,500	188,760	
3	Average ascribed cost of milk to assembly points ¹⁵	11,457.00	1,012.50	1,687.50	14,157.00	4719
4	Farm gate price of milk ¹⁶	687,420.00	60,750.00	101,250.00	849,420.00	4.5
5	Transport cost to moyale/liter	0.46	0.18	0.1	0.74	0.246
6	Total monthly transport cost	70,269.60	2,430.00	2,250.00	74,949.60	24,983.2
	Total monthly cost of milk	769,146.60	64,192.50	105,187.50	938,526.60	312,842
7	Price of milk in Moyale	7.5	7.5	7.5	7.5	
8	Gross monthly income from milk sales	1,145,700.00	101,250.00	168,750.00	1,415,700.00	471,900
9	Gross profit	376,553.40	37,057.50	63,562.50	477,173.40	159057.8
10	Gross Margin for the chain (%)	32.9	36.6	37.7		35.73

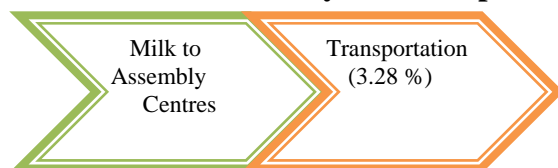
¹⁴ During the FGD the traders and pastoralists respond that the traders will gain from Birr1-1.50 per liter based on the seasons of the year hence average Birr 1.25 is calculated.

¹⁵ From field survey it was identified that from the distance of 8-12 KM some of the pastoralists pay Birr 1.50 for 10-20 liter jerry can and the cost per liter is calculated to be Birr 0.075

¹⁶ Birr 1.50 per cup at rural area is taken to be the farm gate price which is Birr 4.5 per liter

Milk assembly in collection center and transport value chain mapping in Borana pastoral areas.

Figure 22 the milk assembly and transport chain map



6.4. Retail trading

Whole selling in milk is not practiced in Borana pastoralists' .But it is characterized by retail trading.

In all studied areas, both at primary and terminal markets milk and milk products are retailed to local consumers. At primary market mentioned like Surupa, Elweya, Dida hara, Dubluk, Boku Luboma, Tuka and others, majority of the milk and milk products collected and bulked by collectors is daily channeled to Moyale as it is regarded as terminal market. After reaching Moyale town, the milk and milk product will enter the identified out lets. These include retail out let of local consumers, hotels and teashops at Ethio-Moyale town (20%) and the other out let is Moyale-Kenya market (80%).

The respondents and informal groups reported that cow milk retailing price at Moyale terminal market ranges from 5.50-9:50 Birr per litter. On the other hand, milk selling price at Moyale-Kenya market is relatively higher than Ethio-Moyale town and range between Birr 7. 50 and Birr10 / litter based on season and gap between supply and demand volumes.

6.5. Milk and milk product Consumers

Milk and milk product value chain is ended at consumers who buy the products for the ultimate consumption. In all studied areas, marketable milk is reach to the consumers, hotels and teashop through direct purchasing from retailers. Despite, the number of consumers varies from place to place; the consumers are mostly residents of the pre-urban and towns, peoples visiting markets, travelers and etc.

In all studied areas, the culture, economy and social background the types and volume of milk and milk product determine the preference of the consumers. Most of the Borena and Christians preferring cow milk and milk products than camel. Camel milk is mostly consumed by the Garba and Gari clan and very little by Borena. Relatively, cow milk is preferred for consumption by almost all of the consumers. Although, there is no supply of goat milk some consumers (like Gari and Garba) use goat milk.

6.6. Inputs

The main inputs used in cattle production are traditional and modern veterinary drugs. The traditional vet medicines are purchased from pastoralists who have the skill and knowledge of

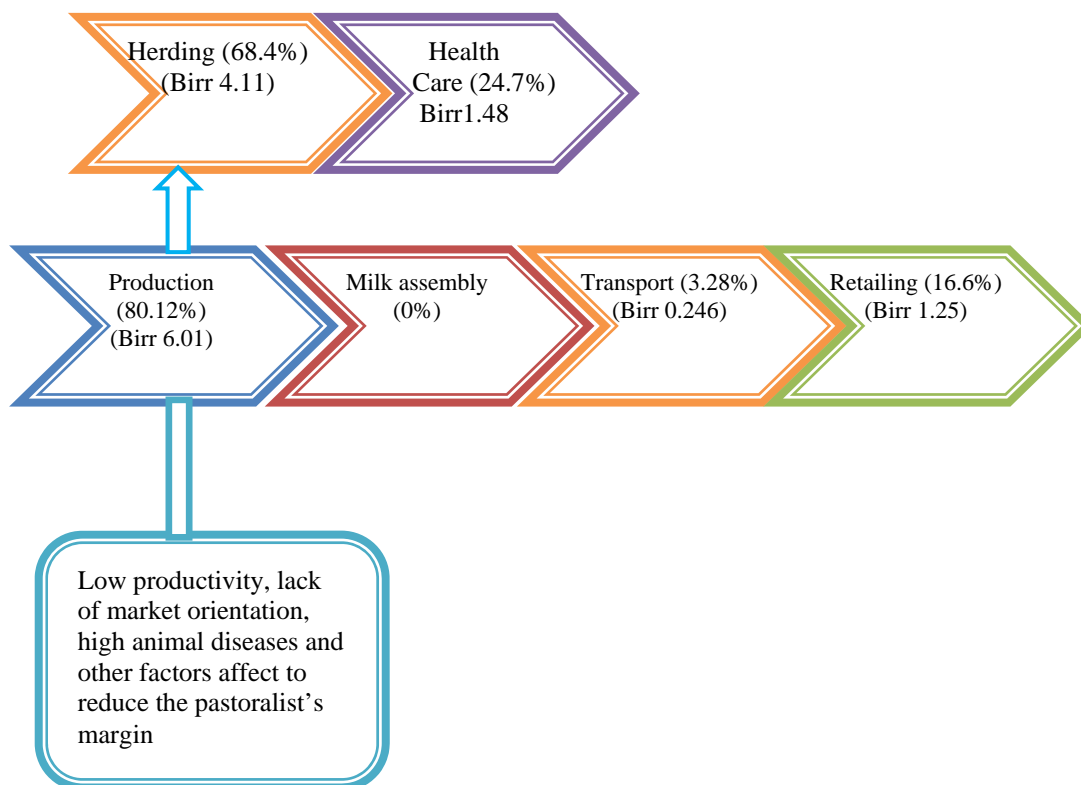
traditional chemist. The modern veterinary drugs are (antibiotics, trypanocides, antihelmintics, etc) and additives like minerals such as common salt. All these items are supplied by, two merchants who engaged in the business as a side business, Zonal Pastoral development offices, from NGOs. The most important drug used is Tryquin for Trypanosomiasis. There are a few brands of antihelmintics but the pastoralists use the cheaper ones. The more effective drugs are not frequently purchased because of its expensive price. The traders supply the drugs from Moyale Kenya and from Awassa and Addis Ababa.

6.7. Summary of Milk value chain

The figure below show the entire value chains for milk into the moyale market. All things being equal, the raw milk value chain in the Borana pastoral area is relatively efficient and hence could be considered as profitable venture. Under the current production systems and cost structures at the producers' level, the most important actors in the chain - milk producers – are relatively making low money as compared to the retailers and traders in moyale. The low productivity, high level of animal disease in the area, and lack of market oriented milk production system, lack of efficient market oriented pastoralists cooperatives, and low level of development of the chain have combined to make volumes handled to be fairly low to an extent that profitability pastoralists' gain is generally low. Out of the total margin per liter about 75.4% goes to the production chain i.e. Birr 6.01 however about 93.1% of the margin goes to herding and health care costs.

The amount of money exactly the pastoralists earn is 0.46 per liter which is margin of 5.6%.

Figure 22: Summary of milk value Chain



7. MILK SUB- SECTOR ANALYSIS

7.1 General

Sub-sector analysis is a process of getting to understand different stages in the value addition chain in a sub-sector and understanding that does the value addition, using what technology, at what terms and with whose help. Subsector analysis involves the following stages: preparing a preliminary sub-sector map and analyzing the sub-sector dynamics, leverage points and choosing intervention points. This section Analyses the milk sub sector based on the information obtained on the previous sections of this paper.

7.2. Milk Subsector Map

The subsector mapping as done based on the milk supplied to the market. On 6.2.3 section of this paper it is indicated that out of the total milk produced in Borana pastoralist area 31% (21654.8 ton) is consumed at household level, 14 % (9780.9 ton) used for social gift, 44% (30740.16 ton) is supplied to the market and 11 % (7685.04 ton) is processed for butter production. Accordingly, the focus of this section is to map out the channels of the milk supplied to the market i.e. (9780.9 tons) and tracing it from the producer to the market in various channels. The key word in this particular section is subsector mapping of milk. In due course it allow to simplify the complex nature of the subsector, helps to identify all key actors and the main leverage points for the sub-sector where targeted interventions could affect the entire value chain.

The analysis of the information obtained from different sources during the study depicts that the milk subsector has three main market channels (Figure 23). The first channel is the milk from the producer pastoralists to the rural households through local intermediaries. The second channel is from the producers to pre-urban consumers and the third channel is from producers to terminal market in moyale and export to Gambo (Kenya). Besides these main channels there is also minor channel where a small amount of milk is transported to different mining areas. Because of its insignificance is not incorporated here and given separate coverage on the map.

7.2.1 Channel one: whole milk direct from pastoralists to rural consumers

This channel is where the pastoralists sell their milk surplus for their immediate needs like to buy tea, grain, tobacco, sugar and etc. During the FGD the total radius of this channel is between 1-8 kilometer radiuses. According to the FGD and key informants discussion from 25-35% of the total milk supplied to the market is sold in this channel. During the FGD it was learnt that pastoralists who have no cattle at all (28.5% of total household in Borana), other pastoralists who do not have milking cows etc are buy milk from this channel. Prices generally determined based on the seasons of the year-high in dry and low in wet seasons, distance from the market centers-the far the distance the lower the price and the near the distance the higher the price. According to the information obtained during the survey the price in this channel is found to be relatively the same as that of other channels except at Gambo –Kenya. This was found because the season of the year is the main factor influencing

the milk price all over the study area. In Brindad (Teltale) for instance it was found the price on May 2009 was Birr 5.50/ liter on the same time it was also Birr 5.50/liter in Moyale town. despite the fact that the price of milk per liter in this channel is comparable to other channels, the price is not enough for the pastoralists to cope with their livelihood calamities because of the cost structure they spend on the milk production(about 90% of the money they earn goes for herding and veterinary medicine expenses). The dynamism of the channel mainly depends on the income of the pastoralists reside nearby the milk producer pastoralists.

Thus as this channel mainly depends on the purchasing power of the rural population at large, it will not be expected the channel will be developed and expanded to benefit the pastoral milk producers to enable them produce at break even and /or the money they gate from this channel improves their livelihood in the short period of time. Hence the profitability of this channel will highly depend on the expansion of another channel to share the milk supplied through this channel in order to maximize income for the pastoralists with the existing amount of milk supplied.

7.2.2 Channel two: whole milk to pre-urban and urban consumers

The main pre-urban, urban centers and open markets in Borana pastoralist area are fall under this channel. The major proportion of milk in this channel is supplied by the producer pastoralists. Most of the producers travel long distance to reach the pre-urban and urban centers. For example, in Surupa milk is supplied to primary milk market by the producers through traveling an average distance and time of 9.67 ± 7.47 Km and 2.18 ± 1.51 hours per day, respectively¹⁷ and reaches to the consumer around 9:30-11:00 am in the morning.

Most of the milk in this channel is supplied fresh to households and restaurants for making tea, child food and for other consumer uses. The pre-urban and urban dwellers buy raw milk form this channel and further process for having butter and Ayib for hotel and house hold consumption a substantial amount is also consumed directly as fresh or fermented yoghurt. As per the information obtained from the respondents during the study up to 45% of milk supplied to the market is sold in this channel.

The milk sold in this channel is relatively higher than the other two channels. The major pre-urban and urban consumers identified were: Surupa, Finchuwa, Haro beke, Dida Haraa, Elweya, Yabelo, Dubluk, Mega, Milami, Marmaro and Brindad. In addition to these, Melbena, Boku Luboma, Hidilola Tuka, SigaBord, Dambi, Sambate, Mormoro, Lay and Elgof are the main. The pastoralist milk producers directly and through the local women traders and processors the milk is reaching the consumers. The greater amount of milk (75-85%) in this channel is transported on the back of donkey and women producers and traders. The remaining balance is transported by trucks and buses along with the pastoralists to the destination market. The price is determined as that of channel one. Of course here is also the main price determinant factor is the seasonality of the year. The women milk processor groups also are under this channel. They buy milk from the produces and or contribute their own milk

¹⁷ (Kemal Hussein, et. at.).

and produce butter (when there is excess milk supply). Though they have challenge to sell the skimmed milk they supply it to the consumers and sell it as health food. Majority of the milk in this channel is sold on open air market and exposed to sun light which enhances its spoilage/fermentation. Unless the milk is sold in the morning the price gets reduced in the after noon because of the fermentation problem.

The main problem of this channel is the pastoralists are not making money in a sustainable manner, when the wet season comes the price relatively gets down because the supply to these destinations will be high and hence the absorption power of the market during such seasons is low. Therefore the channel has to be developed and organized so that the sustainability issue has to be addressed.

7.2.3. Channel three: whole milk to moyale terminal market and to Gambo-Kenya

In this channel milk producer pastoralists through the traders/clients and or agents reach the consumers in moyale terminal market and Kenya export market.

The milk is assembled in four main assembly sites (Surupa, Finchuwa, Bukuluboma and Tuka) and transported by trucks and buses to the destination market. These milk /traders/clients and or agents who always gathered at the center of the town before the trucks and buses arrive and waiting for the milk are up to 98 in number. Each of the traders and or agents knows their own milk container (jerry can) which is marked by the milk sender (producer) and communicated to the receiver. Some of the traders and agents particularly from the Gebra clan are relatives to the producers.

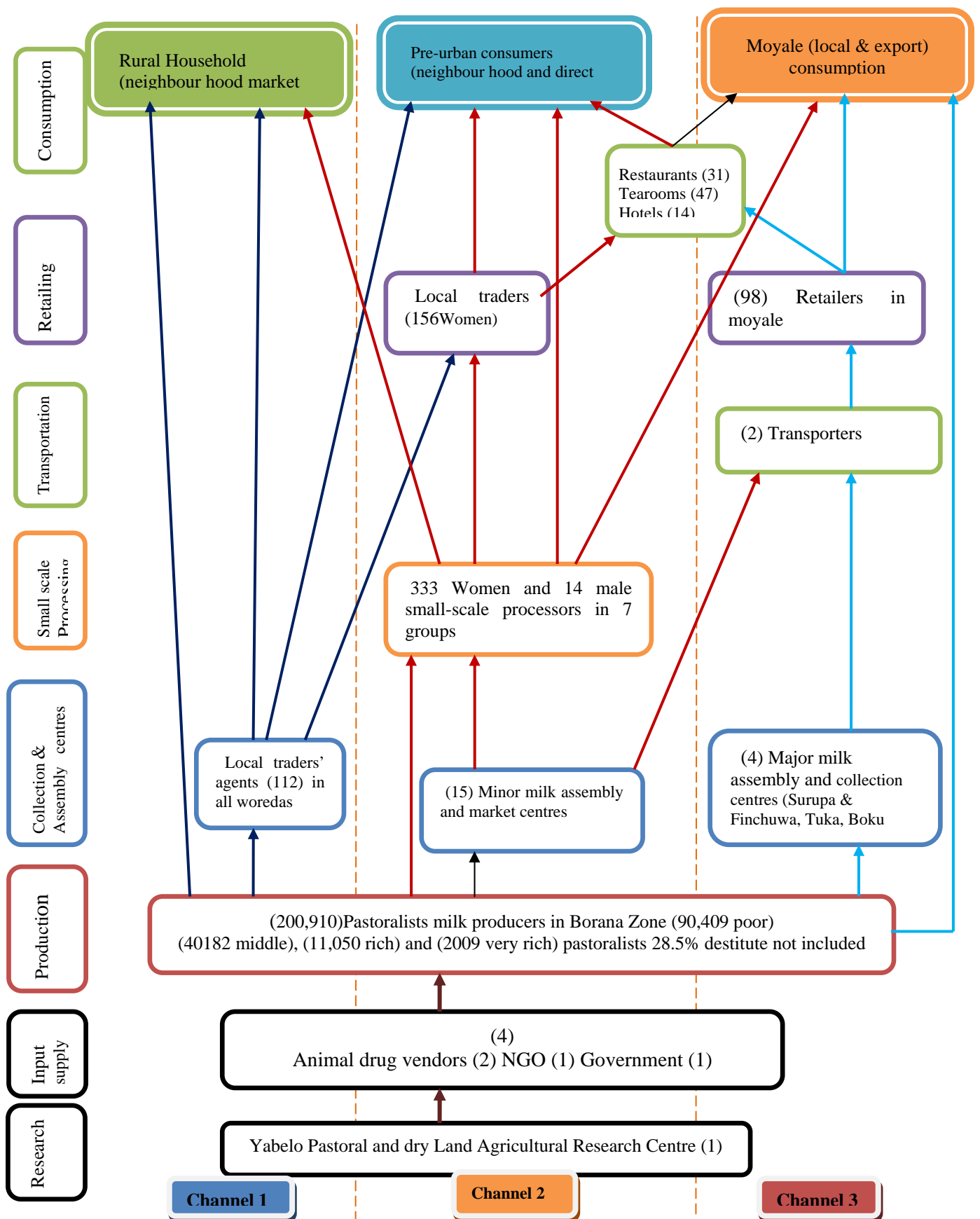
This channel is relatively organized in terms of transportation, governance and trust. The traders are waiting for the milk in moyale town attentively; when right away the trucks or the buses arrive in Moyale they immediately take away their own milk to the consumers. The time factor here is an important-the delay in each step leads to the milk to spoilage-therefore the actions taken in each value chain steps is well understood by the actors as it is money and crucial for improvement of their livelihood.

Despite the fact that this channel is relatively organized and developed, its milk market share as compared to the other two channels is small. It takes in only up to 6.4-10% of the total marketable milk supply of Borana Pastoral area. Out of this percentage up to 70% of the milk is exported to Gambo Kenya. Relatively the lion's share of milk demand for this area is this milk supply. However, the size of the business should have developed better than the current situation. As the information obtained from CIFA-Kenya, the road infrastructure inside Kenya is relatively poor which brought a negative impact to the supply of milk to Gambo area as most of the milk producers are located with the radius of up to 250 kilometers . Hence the Ethiopian milk producer pastoralists have a comparative advantage to tap the potential market of Gambo and its environs. This is because in the Ethiopian side the road is asphalted and hence pastoralists pay less transport cost as compared to the Kenyan pastoralists located relatively at the same distance to Gambo. To utilize this comparative and competitive advantage the chain has to be further developed, additional investment in the chain has to be

injected to establish milk processing (UHT and or pasteurized) in order to increase the shelf life of milk in turn to capture the middle higher and the higher income groups in the area. Regarding the average price of one liter whole milk in moyale is sold at Birr 7.50 and at Gambo market is on the average it is Birr 8.75. However 250 ml of processed UHT whole milk is sold at Birr 5 i.e. Birr 20 per liter (30% is the transport cost from Nairobi to Moyale) in moyale Ethiopia and any body can find it in the shops. Hence the issue of pasteurization is important here to enhance the milk value chain in general and develop this market channel in particular.

The following figure summarizes the three market channel of the milk subsector in Borana pastoral areas.

Figure 23: subsector map of milk subsector in Borana pastoral areas¹⁸.



¹⁸ Adopted from the Camel Milk industry in Kenya ,SNV- Kenya,2008

7.3. The milk sub sector Dynamics

This part of the paper deals with the issues (factors) that have a substantial role in affecting the current situation the milk subsector to bring the positive and negative changes. After identification of these forces which driving the development of the milk and milk products value chain they will be targeted to the leveraged interventions which enhance the competitiveness of the sub sector.

7.3.1 Chain driving forces¹⁹

This study identified six factors that make the basis for the milk value chain dynamics and they are discussed below.

7.3.1.1. Well developed culture and indigenous livestock management system

The pastorals in Borana have a century of indigenous experience and culture in properly managing the livestock herds for getting better milk yield and reproduction year in year out. They also have good attachment with milk production. Milk is every thing for them: food, money and others. Because of this out of the total livestock they keep up to 60-70% of the herd are female animals. They do have indigenous management system of: breeding, herd management, pasture management etc. Among these Busa Gonofa is one of the indigenous social capital systems. In this system pastoralists give milking animals and milk products freely to the destitute and to pastoral communities who have no livestock. Lactating sheep, goats and milking cows are given to relatives and neighbours for milk consumption until they get weaned. In this case it is a free wealth sharing practice which one can see rarely in other parts i.e. the community is responsible by indigenous by laws to support the livelihood of the poorest part of the community .However currently these endogenous systems are eroded by other systems and the situations are getting worse in every aspect of livestock management systems. To reverse this situation strengthening indigenous institutions is of paramount importance.

Hence this indigenous institutions has to be developed and or intermarriage with the current government and other development actors intervention to make sustainable the livestock management in general and the milk and milk products production in particular

7.3.1.2. The involvement of women in milk and milk products value chain

In Borena pastoral areas milk production and marketing are in the major duties of women. Past studies also show that production and marketing of milk products was the task of women (Kemal Hussein, et al). Milking of cows is done by adult and young female. But milking of camels is under taken by both men and women. Where as, sheep and goat milking in all pastoral systems are done by young females and male, the type and amount of milk and milk product utilization for different purposes like household level consumption, gift to relatives, neighbors, processed and preserved and amount to be used for sale are decided by women.

¹⁹ Driving forces refer to those factors that are at the basis of milk sub-sector dynamics – the positive or negative changes taking place within the sub-sector which are responsible for contraction, stagnation or expansion of various channels (camel milk industry in Kenya, 2008).

Adult women also have a mandate to decide the allocation and utilization of income sourced from sale of milk and milk products.

In general, among the Borana pastoralists female play a significant role in milk production and marketing management both at household levels and at small scale milk processing units. In all of milk processing and marketing cooperatives visited during the study almost all of the members are female, out of 333 members male are 14. In addition, milk and milk products market participants in all studied areas are almost belongs to women. Moreover, women are playing a great role in household income generation particularly income related to milk and milk products, because traditionally they are considered as the most money saver and properly utilize, and accountable for family responsibility than the male.

7.3.1.3. Well established milk transport and payment system

Particularly in market channel three there is a well established milk transport and transaction system. This system is highly depend and built up on trust. The trust has no any written agreement. Milk is put on Isuzu truck in the case of Surupa and Finchuwa, in bus in the case of Tuka and Bukuluboma-the driver is responsible to take the milk safely and give to the agent /client/traders in Moyale as per the mark on the container and the instruction on who should collect and when the cars get back the traders/agents give instruction on who the payments are made in the same way. It was learnt that in some occasions this system was harmed and the consequences was affected the pastoralists but it has remained largely consistent and is a driving force in transaction. Notwithstanding this, the system has to be strengthened with the introduction modern systems like transaction through mobile phone, safe money transfer and money transfer through small scale financial institutions.

7.3.1.4 Increased demand for milk and milk products in urban centers

It is apparent that as of other agricultural products the price for milk and milk products in urban centers are increased if not doubled. Given the existing asphalt road infrastructure the milk can easily transported to different urban centers like Bule hora, Dilla and other urban centers through private companies or through organized pastoral communities after a value is added to increase its shelf life. In this case it would be helpful to capture the untapped demand

7.3.1.5. Milk processing culture

The Borana pastoralists have an established milk processing culture. They produce butter and skimmed milk (Arera) for market and home consumption. During wet season the supply of milk become high and the price gets down and to overcome this situation they change the milk into butter and Arera and supply to the market. If the milk supplied to the market is unsold and returned back to home it will be processed and part of the milk products will be sell at the next market and part of it consumed at house hold level. The study was pointed out that out of the total milk produced 11 % (7685.04 ton) is processed at the pastoralists' level. Moreover about 330 pastoralist women groups in different woredas are organized into groups and process milk using a small scale milk churner and cream separator in their units. Though these milk processing units are currently not operating at out to be, however at least laid down

the foundation of introduction of appropriate milk processing technique and technology. In a community where women are responsible for milk production and marketing ,the introduction of such techniques and technologies will be an asset to increase the competitiveness' of the chain through value addition. Here what is needed is to promote the consumption of the skimmed milk as health food in the community particularly who live in pre-urban areas.

7.4. Policy framework pertinent to the subsector

7.4.1. The need of pastoralist focus policies

Pastoralism is a way of life in which livestock production is the major sources livelihood for the people. Pastoralists have unique style of life that suits to their environment. Their natural resource base, land escape, social set-up, institutional arrangements all differ from highland and midland areas. Yet all development policies formulated in the country did not acknowledge such differences and used to prescribe same policy across all locations in the country.

Agricultural extension system developed for highland area used to be imposed in pastoral areas in the past. Such approach has resulted in expansion of cropland at the expense of pasture in Borena pastoral area; invasion of Erian bush species that encroached pasture, weakening of tradition pastoral institutions for natural resource management, inappropriate water site development and eventually low production and productivity of livestock thereby deterioration of pastoralists live. Therefore, one size fits all development policy prescriptions do not work in most instances.

7.4.2. Land tenure in Pastoral Area

The pasture land in the area has been shrinking in size overtime. This is because the communal grazing land is distributed to pastoralists (private owners) to produce crops. Land suitable for pasture production is converted to cropland due to government extension system that emphasis on crop production though the crop production based on rain fed is not viable in the area because of erratic rainfall. This situation harmed the pastoralists into two ways: the first their pasture land is diminished and the other is they are not able to return back the investment cost they incurred for agricultural development because of frequent crop failure. Hence the cumulative effect of such measures is low productivity (low milk yield per animal or hectare) of livestock. Hence the government and all stakeholders have to support to restore the traditional resource management system and develop suitable land tenure policy for Borana so as to increase milk production which is the major food and source of income for the pastoralist community.

7.4.3. Pastoral Dairy development policy

Currently there is no specific dairy development policy to the pastoral communities. Hence there has to be the policy in place.

7.4.4. Livestock Breeding Policy

One factor that has contributed to low productivity (low milk yield) of livestock particularly cattle in Borana area as pastoralists indicated is breed dilution. They further noted that pure Borana cattle breed is on the verge of disappearing. This is attributed to lack of livestock breeding policy both at national and regional level. The country/region should formulate livestock breeding policy in general and dairy development in particular.

7.4.5. Establishment of Pastoralist College

The establishment of Yabello Pastoralists College is a positive move by the government towards improving the livelihoods of pastoral community. Though too early to say about the contribution/ significance of the college it is one step forward toward pastoral area development. Never in the history of this country, pastoralist way of life has been acknowledged and such institution has been imagined. The success of this college have great implication in emulating to other pastoral areas and hence due attention should paid in allocating enough resources in general and milk production in particular. The college has to strengthen its efforts of incorporating milk production, processing and marketing issues. Moreover strategize short term training to the pastoralists and women groups to improve the milk production quality and marketing.

7.4.6. Enabling environments

7.4.6.1. Infrastructure

It was apparent that the main road to Kenya is asphalted however the problem is lack of feeder roads in remote areas where there is potential milk production. The need for electricity for establishing cooling chains is a prerequisite; accordingly it is a positive move in the area for rural electric power expansion being developed. Therefore, government rural electrification program need to be expanded in some of the pastoral areas where there is high milk potential.

Moreover the key infrastructure that have substantial role in facilitating milk value chain development is ICT. It helps in delivering timely information so as to make market participants make informed decisions. Among others mobile phones are very suitable for milk price dissemination. Hence the current mobile phone service has to be improved and there has to be also support to access the pastoralists organization to this technology. Besides market information, this media can be used to provide real-time data on disease outbreak, vaccine campaign, livestock migration, pasture and water conditions to end users. Therefore, government and development partners have to join hands to harness information and communication technologies to support milk and milk products value chain development. In future it is also will be worth considering introducing geographical information services (GIS) for herd and pasturing management in Borena pastoral areas because GIS is the best tool to provide special and temporal real-time data/information for end users.

7.4.6.2. Coordination among the Supporting Institutions

The coordination among the institutions working in the area is a valuable means to improve the milk and milk products value chain. From government organizations : Borena zone rural and pastoral development office, Borena Zone cooperative promotion office and respective woredas offices of same, are some of the institutions supporting livestock production in general. With regard to NGOs :CARE, AFD, LVIA, Save the children USA ,CIFA ,Parima are some NGOs working in the area that directly or indirectly support livestock production. Some of the NGOs in the Borana are not seem to be a development partners but competitors. Hence they need to be coordinated to bring a wide impact on the livelihood of the pastoralists in general and create an enabling environment for the milk value chain actors to develop the chain.

7.5. Leverage Points

These are points that influence the whole value chain. Hence any intervention made in these points could have a spillover effect that could bring a positive change in entire chain. Identifying such points make the intervention and addressing the problem easily. Moreover addressing these points will also allow upgrading the milk and milk products value chain. The study identified the following production, marketing, technical, environmental and institutional related leverage points:

7.5.1. Production potential areas

Yabelo wereda have high potential in total milk production. The study identified that Yabelo wereda produce 14.5 ton of cow milk annually followed by Dire 10.8 then Taltale 10.2 ton. Miyo and moyale stood fourth and fifth producing 8.6 and 3.2.tons respectively. The wereda is also ranks first in camel milk production as compared to other woredas and followed by Dire. Moreover, the main milk collection centers and markets like Surupa, Finchuwa, Haro beke and Dida Hara are found in the wereda. Hence the intervention strategy has to be inline with the existence of the milk potential in the woredas.

7.5.2. Productivity improvement

It is apparent that the productivity of milk in Borana pastoral area is very low i.e. on average 1.5 liter/ cow per day. The productivity varies with the types of the seasons in the year. The productivity increases during wet season (*Ganna*) in March, April and May and short rainy season (*Hagaya*) in September and October). The amount and distribution of rain fall affect the availability of feed and water hence affect the productivity. Among others milking cow management considering feed and feeding management ,animal diseases control (mastitis), availability of AI etc are factors contributed to the low productivity of milk.

7.5.3. Strengthening indigenous institutions

The Borana pastoral community has got their own indigenous institutions since a century. Through these institutions they manage their herds, environments, livestock products, community pastures and other issues pertinent to their livelihood. However currently these

institutions are not well functioning as they ought to be. In some instances like in community pasturing management the institutions are relatively eroded. Hence strengthening such institutions could have its implication in increasing the milk sub sector competitiveness in Borana pastoral community.

7.5.4. Gender issue

The study revealed that women in Borana pastoralists have a substantial role. Women are the one who responsible for production and marketing of milk and allocation of financial resources comes from the milk sales. Hence addressing the issues of milk is addressing the issues of milk and milk products in Borana pastoral community is addressing the issues of women's livelihood improvement.

7.5.5. Environment management

The cheapest source of feed for livestock is natural resources. As a result pastoral communities depend on rangelands for grazing their animals. The economic significance is that about 100% of the total milk and milk products marketed in Borana come from indigenous livestock which, thrive on natural pastures in the rangelands. There is also poor management of pastures in these rangelands characterized by burning. This has a negative impact in that some important pasture species like legumes may find it difficult to re-grow after burning. It was established that pastures in the rangeland cattle corridor areas studied are of low quality²⁰.

The contributing factor responsible for this was deduced to be poor management coupled with bush or weed encroachment, drought and water shortage. Another predisposing factor to the lowering of quality is the quick growth rate of pasture grass during rainy season particularly at maturity. Pastures in the rangelands are therefore characterized by poor yields especially in the dry season.

Consequently, severe feed shortages are experienced during the dry season and most farmers are forced to move with their livestock for long distances in search of pastures and water.

It can therefore be stated without hesitation that the primary nutritional problem of livestock in the cattle corridor rangelands is exacerbated by environmental hazards such as drought/water shortage and overgrazing due to large numbers of livestock populations which, has led to the deterioration of range condition.

The major indicators of rangeland degradation are shrub/bush encroachment, gully channels as a result of water erosion and bare ground along cattle tracts and resting grounds. All these indicators especially shrubs/bushes affect livestock nutrition mainly by reducing the size of grazing land and suppressing growth of palatable grasses. Generally such situation affects the milking cows directly and reduces their milk production during dry season and consequently affecting the livelihood of the pastoralists. This is attributable to the fact that adoption of the use of effective rangeland technologies have been impeded by:

- attrition of indigenous rangeland management system
- inadequate sensitization,

²⁰ Oromia pastoralist development commission (2008)

- lack of pasture seeds;
- low income of some livestock pastoralists (the poor wealth group);
- Conservative traditional livestock-keeping attitudes amongst pastoralists aggravated by lack of economic incentives towards improved animal productivity, for example, poor marketing and lack of credit facilities for pastoralists to invest in range/pasture development.

7.5.6. Institutional Arrangements

The study was pointed out that there are NGOs and different government offices working on the improvement of the livelihood of pastoral communities in Borana. The existence of these organizations is an asset for the improvement of the milk sub sector in Borana. Substantial amount of budget is allocated by the government and NGOs to improve the livelihood of the pastoralists. However they strongly lack coordination and cooperation in areas which they are going to implement. Duplication of efforts is apparent by NGOs working in Borena pastoral area. The study team observed that where three NGOs and one government project claim giving the support for single small scale milk processing women group. Yet the processing unit was not functional by the time of this data compilation. In the scenario the development organizations including the government are wasting resources by supporting a single processing unit which will have low developmental impact in changing the livelihood of the community in the area. Therefore, to bring a broad based development impact through increasing the competitiveness of the milk and milk products value chain all actors have to get coordinated and work such a way enable them utilizing the meager resource they have. In this case, the establishment of consortium on milk value chain among the development actors (government, NGOs, private companies and pastoralist groups) operating in the area will leverage the whole of milk and milk products chain.

7.5.7. Milk quality management

The main causes of deteriorating milk quality in Borana pastoralists identified in section 4.1.3 of this paper are emanating from ignorance and are at the production level. Though currently the consumer did not demand the quality issue at the spots of consumption, it will be demanding in the near future when private processors engage in the subsector-then quality issue become the critical factor in the transaction. The higher the quality the milk will be purchased and vice versa which in turn will affect the house hold income of the pastoralists. Hence, intervening in the milk quality issues mean increasing the shelf life of the milk so that increasing the income at house hold level.

7.5.8. Addressing the poor pastoralists

Overall goal of the intervention on the milk and milk subsector value chain is to reduce poverty in the pastoral community of Borana. It was learnt that on the average about 73.5 percent of the pastoral population constitutes destitute and poor wealth category. Out of which 38.7 are destitute with no livestock and milking animals and the remaining balance 61.2 % are poor pastoralists who have 1-5 livestock. During the data analysis the poor have at least 1 milking cow in the year. The poor produce milk expensively than the middle, rich and very

rich wealth category pastoralists. Accordingly the poor costs Birr 0.79 per which is 33% greater than the cost spend by the middle category, 29.5% than the rich and 92% than the very rich wealth category. This implies that the poor get lower margin than the other wealth category fellow pastoralists. In view of that the poor pastoralists get 14% less margin than the middle group, 12.5% less than the rich and 26.5% less than what the very rich category gains. This means poor women earn fewer margins from milk sales than the middle, rich and very rich pastoral women categories. Hence interventions based on wealth category have to be appreciated at all levels to attain livelihood improvement to those poor target groups.

7.5.9. Small scale milk Processing

One way of increasing the shelf life of milk and changing the milk into different products to take advantage of lower milk price in pastoral areas is processing. Enhancing the viability and business sustainability of these ventures in all studied woredas could increase the competitiveness of the milk value chain particularly during the wet season. The group dynamics has to be improved, the units have to be profit driven, the groups should at least know the basic business knowledge, the down stream market linkage for the milk products has to be done, continuous follow up by different actors has to be there.

7.5.10. Engagement of the private sector

One of the factors that ensure the competitiveness and sustainability of the milk and milk products value chain is the engagement of private investors and service providers in the chain. The private sector could engage in to two forms: the first is as service provider and the other engagement is investing in milk processing pasteurizing and or UHT milk production to potential urban centers and export market. The private sector could supply goods and services to the pastoral community like livestock clinics, veterinary medicine, concentrates and silage during the dry season, chilling center establishment etc.

7.5.11. Market development activities

The study revealed that the utilization of milk by the pastoralists differ based on whether the pastoralists are located near or far to the conventional open air markets and or to sub and urban centers. Accordingly pastoralists who produce more milk and or potential for the production how ever they supply less milk to the market and the higher proportion is used for social gift and consumed at household level. Out of the total milk produced in Borana pastoralists only 44% percent is supplied to the market. Majority of this milk is supplied from the villages' located access to roads and other means of infrastructure. Therefore, to maximize the household income of these pastoralists through maximizing milk sales, the market development tasks have to be done and link with the main urban and terminal markets.

7.5.12. Market oriented pastoralists cooperative

Market oriented pastoralist milk producer groups has to be established and increase the pastoralists' competitiveness in the milk value chain. If the milk producers organizations are

commodity oriented than community oriented organizations, they provide benefits only to members could lead them to make viable business in a sustainable way.

In this respect, the milk producer organization needs to be very clear about the goal it is working toward: increasing and stabilizing incomes for their constituencies, or providing a platform for participatory governance and empowerment. The milk producer groups in the pastoral should have the role of ensuring the stability and longevity of milk business linkages with private processors, consumers, other service providing companies and in delivering a fair distribution of profits to their members. Moreover they have to be essential for increasing win-win outcomes from the business linkages they established through the course of time.

From a pastoralist's perspective, milk producers' producer organizations should help balance the power between all actors along the chain: collective bargaining, and the creation of relationships with credit and transport providers, can help reduce the risks pastoralists face. Moreover, pastoral milk producers' organizations should provide a forum where pastoralists can express their dissatisfaction over prices, timing, and increase the likelihood that an organization should recognize its social and environmental responsibilities.

From a private sector's (other value chain actors) perspective, pastoral milk producer organizations reduce the transaction costs per unit and resolve information and communication blockages. They are also important for fostering good relations between the pastoralists and the milk processors, as well as providing peer-embedded incentives for members to repay loans. Thus establishing milk and milk products oriented producers organization have a substantial impact to improve the vertical and horizontal integration of the milk subsector in one hand and increase the competitiveness of the pastoralists engagement through reducing transaction cost and improving the quality of milk that will be supplied to the market and to the current and the would be established processors.

7.6 Strategic Interventions

Based on the discussion made on challenges and opportunity of milk and milk products and the findings of the discussion made with the pastoral community and other stake holders , the following intervention points are identified –that would potentially done by all the stakeholders (private sector, development organization ,the government and the pastoral community):

7.6.1. Establish Borana pastoralists' milk and milk products stakeholder forum (commodity oriented):

- Lobby the government and other stakeholders to exert a coordinated effort to develop the milk and milk products value chain
- Organize a work shop that participates all the stakeholder of milk and milk products value chain
- Sensitize value chain concept as an economic tool to develop the milk and milk products value chain in Borana pastoral area

- Promote the value chain approach as an economic tool to tackle the problems of milk and milk products value chain
- Present the intervention points identified and enrich by accepting more from the stakeholders and show how the situation needs a holistic approach.
- Establish permanent stakeholder forum with the private sector plays a leading role and decide permanent meeting period to evaluate the work progress done by different actors
- Recruit business development service provider to the chain that facilitate the communication among the stakeholders, who disseminate information to all of the stakeholders and who facilitate the stakeholders' meetings.

7.6.2. Improve the productivity of the range land:

- Promote the role of indigenous institution in managing pastures and other related aspects
- Organize a meeting with the elders of the pastoral community with the collaboration of zone administration and OPDC
- Develop the community pasture land management by law inter- marriage with modern and other policy issues
- Support reducing the existing bush encroachment and weeds infestation in range lands
- Improving on pasture/fodder production through proper management and utilization of existing natural pastures by: introducing improved and drought resistant forage species, especially legumes; and establishing ley pastures on the existing farms within the rangelands;
- Sensitization of pastoralists on practicing proper grazing systems applicable to the rangelands in the different areas along with control of bush fires for increased livestock production;
- Supplementation of poor feeds with forage legumes and/or addition of commercial supplements to improve utilization by the animals;
- Incorporating forage legumes and multipurpose trees which fix nitrogen to improve soil fertility; have high nutritional value and high digestibility as well as being drought resistant.
- Establishing zonal capacity to produce pasture seeds locally by contract growers which will then improve the availability of improved pasture seeds to extension system agro pastoralists'.

7.6.3. Establish a dry season feeding mechanism for milking cows

- Strengthen the indigenous knowledge that the pastoralists have on milking cow management during dry season
- Support model pastoralists to establish feed conservation and preservation schemes at the time where they are plenty for using them during dry season
- Scale up the system through incorporating the extension system and providing training to the kebele development agents and representatives of pastoralists
- Promote the venture to private companies and to very rich pastoralists to engage in silage making and fodder banks establishment.

- Though standing hay is risky in drier areas due to fire, which is commonly seen in pastoral area during drought, promote it through the community participation
- Link the pastoralists group with concentrate feed producers in Awassa, Adama and Bishoftu during the dry season.
Improvement in the evenness of water point distribution across the whole range system so that pastures can be used and the deterioration due to overgrazing surrounding the water points will be controlled.
- Strengthening tradition herd division and separate Milking animal's management and husbandry practices

7.6.4. Support the improvement of milk market and marketing

- Develop milk market development strategies for Borana pastoral communities
- Show the profitability of the milk business in Borana to the big private companies to invest on UHT/pasteurizing milk processing industry and to establish chilling centers at different potential milk production sites
- Support pastoralists to organize them selves into milk marketing groups and cooperatives with a voice
- Educating pastoralists on the need for milk marketing and meat consumption. Deliberately step must be taken by government to instill the culture of milk and meat consumption.
- Promote the introduction of appropriate rural milk transporting facilities and lobby for the improvement of village/feeder roads
- Promote the consumption of skimmed milk as a health food to different urban consumers at different occasions
- Facilitating raw milk trading modalities between milk collectors and the milk processing and marketing groups with clear and legal agreement and market trust in place
- Facilitating effective and efficient market information net work that can be accessible by all actors fairly benefit the actors along the milk market channel.

7.6.5. Borana breeds maintaining scheme to improve milk production and productivity

- Collaborate with the government, development organizations and promote private sectors to engage in establishing artificial Insemination centers
- Introduce in village community bull scheme: A desired bull is introduced into an area and put under intensive care. Animals to be part of the scheme are identified and registered. When an animal is on heat she is sprayed and brought to the bull. The extension work provides the necessary technical support. Regular health check up on the bull is necessary. Service charge should be collected by the bull scheme committee for the use in maintenance of the bull. This would work to supplement AI services in areas, which are far from AI stations, and yet quality bulls are required. It is relatively cheap to compare to AI services.

7.6.6. Improve milk quality

- Train women groups and pastoralists on the issue of milk quality management through incorporating in the existing extension services and different interventions done by different development organizations (NGOs).

- Support mechanisms for setting of appropriate quality standards in milk and milk products their enforcement – both by actors.
- Facilitate development of simple and easy to use testing equipment for milk quality with acquisition of appropriate milk handling containers among producers and other actors along the value chain with awareness campaigns to stimulate demand for quality milk among consumers in the process of ensuring quality
- Establish quality payment systems at the processing level
- Facilitate credit to the pastoralist groups to purchase aluminum container to avoid plastic jerry can.

7.6.7. Improve the animal health to improve milk production

- Undertake strategic vaccination programs for economically important diseases in the
- Strengthening the capacity to undertake diagnostic, epidemiological surveillance and reporting by upgrading laboratory
- Supporting efforts to limit the spread of these diseases through controlled livestock movements.
- Strengthen the current efforts done by the government and development organizations to improve animal health in pastoralist
- Promote private sector and the development organization to provide the service at affordable prices
- Control the use and distribution of veterinary products
- Train youth pastoralists to identify the type of disease and the treatment needed
- Train women pastoralist the cause of mastitis and the appropriate measures taken
- Demonstration and sensitization on cheaper methods of tick control.
- Support to establish community based animal health workers

7.6.8. Gender and Culture

- Strengthen the existing organized women groups and scale up the best practices in other areas where there is no organized women groups
- Capitalize the role of women in pastoral areas particularly in milk production, marketing and resource management derived from milk.
- Access credit to women groups who are engaged in milk and milk products production
- Provide market linkage and market development services for the milk and milk products produced by women groups
- Target poor women (from poor wealth rank house hold) at all interventions
- Building the capacity and business knowledge of milk producer pastoralists to transform the existing pastoral production system into market oriented increased production through Continuous and regular extension services to the target pastoral groups

7.6.9. Support to establish market oriented pastoralists' organization

- Conduct a stakeholders meeting to discuss the importance of market(commodity) oriented pastoral groups in milk production and marketing business

- Support the existing Olla (village) based milk collection and market supplying women groups to establish the cooperatives to strengthen milk production, collection, transportation, processing and market supply.
- Target the pastoral/agro-pastoral women who have relatively potential to supply raw milk for processing and marketing from home yard production and/or collection from relatives and neighbors Olla
- The target selected pastoralist groups would be who have an optimum number of diversified species milk producing animals, full time pastoralist (with experience of milk producing livestock herd management and husbandry and milk production)
- Pastoral and/or agro-pastoral women who are showing common needs and interests for organizing together, more likely to make responsibility and accountability in cooperative working and the necessary commitment to the center and its success has to be identified
- Support to establish the union(service and material provider, legitimate to its constituencies) to use the advantages of economies of scale
- Give care for pastoralists/agro-pastoralists who are just looking for subsidized goods and stock, and poorly responded to extension advice based on the past experience
- Support organizational and business development services to strengthen the newly established pastoralist groups
- More sensitization for the herders to internalize advantages and importance of working within groups
- Support to have legal registration and legislation

7.6.10. Support the existing small scale milk processing units

- Organization of satellites milk collection and supplying pastoralists groups and or association at a distance of 20-30Km radius from the milk processing and product marketing centers
- Linking the organized satellites milk collecting groups with main milk processing and product marketing association/groups
- Building strongly by-low tied cooperative members milk collection accountability and responsibility and linking each members with defined milk collectors satellite groups/association
- Applying suitable milk and milk product preservation techniques and methods
- Improving milk products diversification and value adding practices
- Support some of the processing units to have better processing area
- Train some of the members and or youths in the area maintenance of the processing equipments or identify and link with private companies working on it in the nearby urban centres
- Support to develop a business plan for the groups showing whether they are operating at profit or loss during the wet and dry season
- Train the group to develop their business and marketing skills
- Provide a continuous organizational development support
- Establish incentives for the executive bodies
- Support in market linkage and market development for milk products

7.6.11. Promote private sector to engage in milk sub sector

- Make a meeting with the zone administration and other actors the need of the private sector on milk processing and the need of special packages of incentives
- Work with the government to design packages of incentives to the private sectors
- Promote the business opportunities of milk business in Borana pastoral areas
- Lobby and link with the investors that are knowledgeable to the area and others
- Organize investors workshop to promote the milk investment opportunities
- Support for the increased availability of milk business development service providers able to advise pastoral producers groups not only on husbandry issues but also on business practices and market access.

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