

# Ethiopian Agro-Industry Strategy Dairy Sub-sector

Ministry of Industry





Ethiopian Agro-Industry Strategy

**DAIRY SUB-SECTOR**

**April 2013**



# PREFACE

Agriculture is a major contributor to the Ethiopian economy. Yet, in spite of the large amount of agricultural products grown in the country, Ethiopia remains largely dependent on imports of semi-processed or processed food; products that have the potential to be made in Ethiopia.

From a development perspective, a strong domestic Agro-Industrial sector is of utmost importance for Ethiopia, not only in order to decrease its dependence on imported products, but also to drive the transition of the traditional supply-led subsistence agricultural system towards an organized, high-tech, safe, and demand-led agricultural system. An expanding Agro-Industrial sector has the potential to create employment opportunities and change the lives of the Ethiopian farmers and their communities – traditionally the rural poor – who supply the raw material to the processing industries.

Towards achieving accelerated economic growth and poverty reduction, the government of Ethiopia is implementing the Growth and Transformation Plan (GTP). Earlier strategies include the Plan for Accelerated and Sustained Development to End Poverty (PASDEP), the Agricultural Led Industrial Development (ALDI) Strategy and the Industrial Development Strategy (IDS). In this vein, the Government of Ethiopia requested the United Nations Industrial Development Organization (UNIDO) to assist in the preparation of the Agro-Industry development strategy to address the required linkages between agriculture and Agro-Industries in line with the PASDEP, the IDS and ALDI.

This document was developed by the Ministry of Industry (MoI) in collaboration with the Ethiopian Meat and Dairy Technology Institute (EMDTI) under the Ministry of Agriculture (MoA) and with the support of UNIDO. A multidisciplinary team of experts led the development of the document through continuous dialogue between the project team and all stakeholders – research institutes, chamber of industries, sectoral associations and regional government offices – by means of numerous workshops, individual interviews and group discussions. The resulting draft strategy document was subsequently subject to review by Ethiopian experts.

The Dairy Sub-sector Strategy is the 6th volume of the Ethiopian Agro-Industry Strategy for increasing competitiveness, exports and investments as well as employment and capital, in the priority Agro-Industry sectors of Ethiopia. On the basis of objective analysis, strategic themes for the next five years have been identified. Each strategic theme demands all stakeholders work jointly on the key action plans and related interventions that must be implemented to deal with key strategic challenges facing the priority sectors.

The strategy documents comprise six volumes as follows:

Volume I	Ethiopian Agro-Industry Sector Strategy
Volume II	Ethiopian Agro-Industry Strategy - Cereals Sub-sector
Volume III	Ethiopian Agro-Industry Strategy - Oilseeds Sub-sector
Volume IV	Ethiopian Agro-Industry Strategy - Coffee Sub-sector
Volume V	Ethiopian Agro-Industry Sector Review
Volume VI	Ethiopian Agro-Industry Strategy - Dairy Sub-sector

Volume I describes identified competitiveness drivers that are of a cross-cutting nature and are considered of utmost importance for the accelerated development of the entire Agro-Industrial sector. The current situation is outlined, wherein the critical problems that constrain the development of the sector are identified. Strategies to tackle these problems have been developed and targets set for 2015.

Volume II, III, IV and VI go deep into the four prioritized sub-sectors, analyze the constraints of each value chain, provide SWOT analyses, benchmark the performance of the Ethiopian Agro-Food industries against similar industries in selected countries and provide a strategy and detailed action plans to overcome the constraints for improved competitiveness in local, regional and global markets.

Volume V contains the background data needed for the development of the strategies. It provides a thorough assessment of the Ethiopian Agro-Food sector's contribution to the Ethiopian economy and the sector's performance on a global perspective, identifying critical problems faced by the sector at each level.

This sector development strategy is not a formula for instant success. Instead, it offers the basis for collective engagement of stakeholders (private and public) at the national, provincial and sectoral levels.

Long standing challenges of competitiveness, exports and investments as well as employment and equity will not be solved quickly. Concrete time frames to achieve the objectives have been put in place. Maximum cooperation from stakeholders is a key condition to achieve these goals within the time frame.

The process employed for the development of the strategy represents an attempt at generating a common understanding, rooted in objective analysis around key strategic challenges and opportunities facing the Ethiopian Agro-Industrial sector; it leaves the path open to move 'beyond planning to action', for all parties based on a common vision.

## ACKNOWLEDGEMENTS

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## Executive Summary

The Ethiopian dairy sector has tremendous national importance. With 49 million cattle, 25 million sheep, 22 million goats and 0.76 million camels, Ethiopia has the largest livestock population in Africa. In addition to providing a nutritious source of food, the dairy sector contributed 33.5 percent to the agricultural GDP or 11.7 percent to the national GDP in 2008. The sector generates employment opportunities for many people throughout the country.

Milk production in Ethiopia is increasing. The increase, however, is not the result of overall growth in productivity. On the contrary, overall productivity in Ethiopia remains relatively low. The average cow milk yield for the years 2000 - 2010 in Ethiopia was 2,160 Hg/An. This is low compared to countries like Kenya (5,500 Hg/An), Egypt (14,500 Hg/An) and South Africa (32,700 Hg/An). This suggests that there is a considerable potential for improvement.

Ninety percent of milk production in Ethiopia is undertaken by smallholder farmers. Their livestock depend almost entirely on natural grazing lands and most of the milk produced on these farms is retained for household consumption. The challenge for Ethiopia is to increase the productivity of smallholder farmers. This can be accomplished through improved feed, improved veterinary services and improved breeds. This strategy takes stock of the current situation and proposes concrete interventions to improve overall milk production in Ethiopia.

The distribution of milk and dairy products takes place through both formal and informal marketing systems. The informal system is characterized by an absence of licensing requirements to operate, no regulations, low cost of operations and high producer price when compared to the formal market. The traditional processing and marketing of dairy products, especially traditional soured butter, dominate the Ethiopian dairy sector. However, unreliable and unhygienic processing methods contribute to poor product quality. In addition, limited recourse to chilling and cooling facilities during milk collection leads to a deterioration of milk quality and high losses. The strategy proposes interventions specific to milk collection to ensure that the quality does not deteriorate due to improper handling.

Dairy processing is mainly undertaken by medium- and large-scale firms. The number of these dairy processing industries has increased from one public dairy processing plant in 1999-2000 to five (private) commercial dairy processing facilities in 2008-09. Their contribution to output, employment generation, value addition and marketed outputs has also shown an increasing trend over the same period. The increase in gross annual value of production and value-added per year is more than eleven times compared to the value registered in 1999-2000. The production of processed dairy products in the country has also shown significant growth over the last decade. Production of pasteurized milk has grown from 3.83 million kg in 1999-2000 to 16.09

million kg in 2008-09. The large- and medium-scale dairy processing plants have chilling facilities at all collection centres and the collected milk reaches the processing plant within 24 hours. In addition to the five large- and medium-scale companies, there are more than 10 small- and micro-scale dairy processing industries, including some cooperatives.

However, the growth of medium- and large-scale processing industries is constrained by various factors. Unreliable supply and the high cost of packaging materials continue to limit investment in processing and packaging technology. Most of the existing processing facilities lack the state-of-the-art technologies for the manufacture of value-added dairy products such as UHT, yoghurt and ice cream. There is a need to modernize the technologies of processing industries and to increase the number of skilled dairy processing professionals and technicians.

The creation of a quality control system is crucial for the sustained development of the dairy value chain. Currently there is no comprehensive food safety policy in Ethiopia. The food control activities are scattered among various ministries. Inspection remains random and a clearly defined inspection body – with the responsibility and authority to implement food-related safety measures from farm to fork – is absent. Ethiopia lacks a structured food borne disease and contaminant surveillance and risk assessment system. Low capacity in terms of infrastructure development and human research development are some of the constraints hindering the development of robust food quality and safety systems and procedures. The requisite infrastructure for addressing Sanitary and Phyto-Sanitary (SPS) requirements in Ethiopia do not meet international standards and this has negative effects on trade and investment.

Both the volume and value of Ethiopian dairy exports are low. Milk and butter were exported to only a small number of countries including Djibouti, Somalia, South Africa and the Ethiopian diaspora. The imports of dairy products vary considerably from year to year, but the value of the imported dairy products is substantial enough to lead to a negative net trade balance ranging from US\$ 5 million in 2007 to US\$16 million in 2010.

Ethiopia has the potential to become a net exporter of dairy products. However, meeting international standards on equipment and practices has proven challenging. Processors that have adopted such technologies and practices have subsequently been obliged to increase their price, leaving them uncompetitive in comparison with companies that have not adhered to international practices. A strong monitoring system would ensure a level playfield among all processors and safe dairy products for the Ethiopian people. The role of the Government of Ethiopia cannot be underestimated when it comes to establishing a proper dairy regulatory and policy framework. The newly established Ethiopian Meat and Dairy Technology Institute (EMDTI) can also play a key role and it is recommended to further build the capacity of the institute.

Finally, there is a need to develop financial instruments for the different segments of the dairy value chain. Large-scale investment is required throughout the value chain and Ethiopian banks must be provided with the tools and knowledge to respond effectively. Banks, dairy cooperatives and farmers need to come together to share information about the dairy and banking sectors and develop investment projects that modernize small-scale dairy farms and collection centres.





# CHAPTER 1: ANALYSIS OF THE GLOBAL DAIRY SECTOR

## 1.1 Introduction

The global dairy sector is entering new era characterized by a consistent increase in world milk production on average; growing consumption on account of increasing population and higher disposable incomes; and increasing world dairy trade due to economic growth, domestic policy reforms and bilateral and regional trade agreements.

This section addresses global dairy trade flows, key countries and actors and the successful dairy trade models they have adopted. The identification of global and regional markets for each dairy product along with the major exporting and importing countries is also addressed in this chapter. The success factors behind leading exporting countries are outlined. The following topics are covered and related to the Ethiopian context:

Identification of demand and supply patterns in leading producing and consuming countries;

Value Chain analysis of products in key global trade countries;

- Identification of trade patterns in key importing and exporting countries;
- Analysis of successful production, trading, processing, supply, distribution & marketing models in key countries;
- Impact assessment on domestic and international trade due to regulatory norms adopted by key countries;
- Identification of key destinations and markets for exports.

Based on the availability of data, the following products have been analyzed with respect to global production, consumption and trade as tabulated in Table 1A.

**TABLE 1A: ARRAY OF PRODUCTS ANALYZED FOR GLOBAL PRODUCTION, CONSUMPTION AND TRADE**

Sr No.	PRODUCTION	CONSUMPTION	TRADE
1	Cow Milk	Milk	Cheese
2	Buffalo Milk	Butter	Skimmed Milk Powder
3	Milk from Sheep, Goat and Other Animals	Cheese	Whole Milk Powder
4	Butter and Other Milk Fats		Butter and Butter Oil
5	Industrial Cheese		Whey Powder and Whey Product
6	Condensed Milk		
7	Skimmed Milk Powder		
8	Whole Milk Powder		
9	Milk Byproducts – Whey Products and Casein		

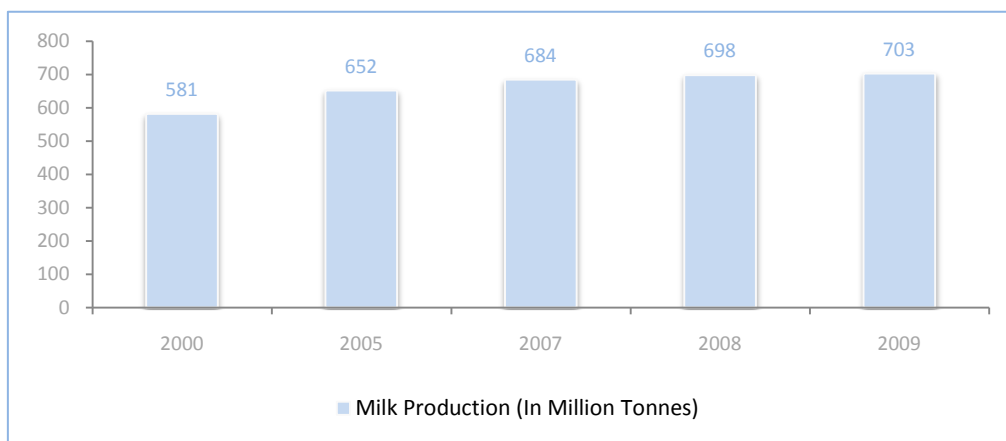
Source: *The World Dairy Situation 2010, Bulletin of the International Dairy Federation*

## 1.2 Global Production and Consumption Trends of Milk and Milk Products

### 1.2.1 GLOBAL PRODUCTION TRENDS OF MILK (COW MILK, BUFFALO MILK AND MILK FROM OTHER SPECIES)

The total world milk (all species) production in 2009 reached 703 million tonnes indicating a compounded annual growth rate of + 2.1 percent between 2000 and 2009. The total world milk production from 2000-2009 is depicted in Figure 1A below:

FIGURE 1A: TOTAL WORLD MILK PRODUCTION (2000-2009)



Source: CNIEL, PZ, FAO and IDF National Committees

Cow milk production contributes 83.52 percent of the total world milk production. As of 2009, global cow milk production was reported at 587 million tonnes, indicating a compounded annual growth rate of +2.0 percent between 2000 and 2009. The Asia region contributed 26.27 percent closely followed by EU 27 with 25.17 percent. The compounded annual growth rate was highest in Asian countries at +5.6 percent followed by Africa at +3.7 percent. India (31 percent), Germany (20 percent), USA (91 percent), Russia (53 percent), Brazil (47 percent), Sudan (20 percent), New Zealand (64 percent) and Mexico (76 percent) are the largest contributing countries of cow milk production in Asia, EU 27, North America, Other Europe, South America, Africa, Oceania and Central America regions respectively. Cow milk production in Ethiopia was 1.4 million tonnes in 2009, contributing 5.14 percent of Africa's total cow milk production. After Egypt and Kenya, Ethiopia has registered the compounded annual growth rate of +5.0 percent from 2000 to 2009.

Buffalo milk production contributes 13 percent of the total world milk production. As of 2009, buffalo milk production was reported at 90 million tonnes, indicating a compounded annual growth rate of +3.3 percent between 2000 and 2009. More than 90 percent of buffalo milk is produced in India and Pakistan. Smaller volumes are produced in China, Egypt, Iran and Italy.

Goat milk (2.2 percent), sheep milk (1.3 percent) and camel milk (0.2 percent) contribute the remainder of the total world milk production. According to the FAO sources, 59 percent of goat milk is produced in Asia, followed by 21 percent in Africa

and 16 percent in Europe. Sheep milk production is mainly concentrated in Asia region (46 percent) and Europe (34 percent). 89 percent of camel milk is produced in Africa.

## 1.2.2 GLOBAL PRODUCTION TRENDS OF MILK PRODUCTS

### 1.2.2.1 Liquid Milk and Fresh Dairy Products

The liquid milk output was reported to be 119 million tonnes in 2009 as per the data collected from 50 selected countries which represent 70 percent of global production. The major regions identified include the EU 27 (32.8 million tonnes), the USA (25.2 million tonnes), China (13.2 million tonnes), Brazil (10.9 million tonnes), India (7.9 million tonnes from cooperative dairies), Mexico (4.5 million tonnes), Russia (4.3 million tonnes) and Japan (3.9 million tonnes).

The fresh dairy products including fermented products and milk drinks were mainly produced in the EU 27 (10.4 million tonnes), China (3.2 million tonnes) and the USA (2.5 million tonnes) in 2009.

### 1.2.2.2 Butter and Other Milk Fats (Butter Oil and Ghee)

Global butter production and other milk fats is estimated between 9.5 and 10 million tonnes with India leading the global production with 3.9 million tonnes, followed by the EU 27 with 2.0 million tonnes.

### 1.2.2.3 Industrial Cheese

The global output of all cheeses excluding processed cheese is approximately 20 million tonnes. Cow milk cheeses contribute to 80 percent of the total cheese production. The EU 27 and the USA have emerged as the top two cheese producers with the output of 8.3 million tonnes and 4.6 million tonnes respectively.

### 1.2.2.4 Whole Milk Powder (WMP)

Whole Milk Powder (WMP) production is estimated at approximately 4 million tonnes. China has a 45 percent production share (1.0 million tonnes), followed by New Zealand (0.8 million tonnes). The last two years witnessed a decline in WMP output in various parts of the world including China due to a melamine crisis; drought conditions in Australia; and processors resorting to skim milk powder and other products like cheese, liquid milk and fresh dairy products production for domestic markets.

### 1.2.2.5 Skim Milk Powder (SMP)

Global skim milk powder production is approximately 4 million tonnes. The EU 27 and the USA are the leading producers with the production of 1.1 million tonnes and 0.8 million tonnes. New Zealand has also witnessed an impressive growth in skim milk powder production (0.36 million tonnes) last year due to increased growth in exports mainly to eastern and south-eastern Asia.

### 1.2.2.6 Condensed Milk

Global condensed milk production is estimated at around 4.7 million tonnes. The main production regions include the EU 27, Peru, Brazil, Russia and China.

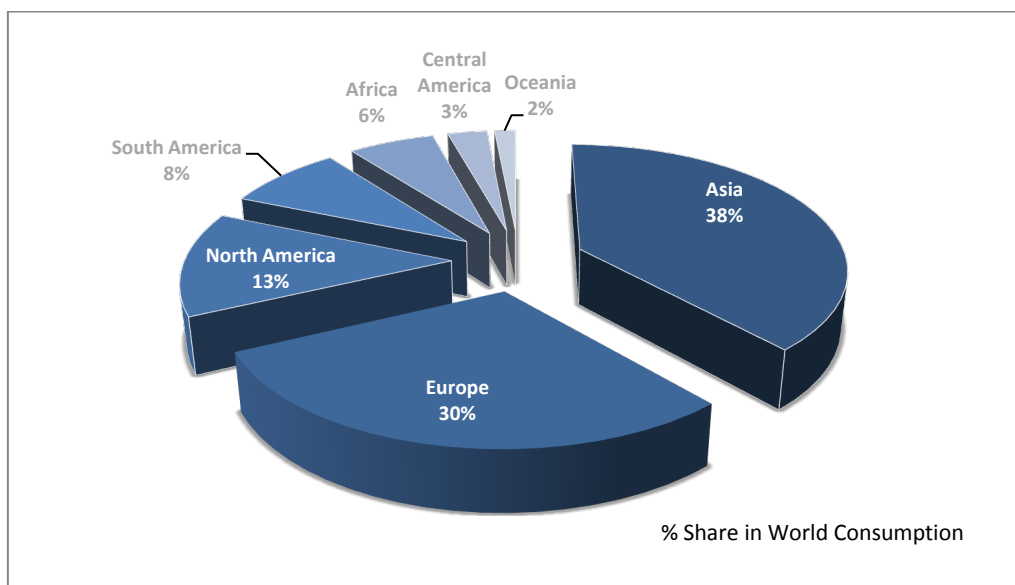
### 1.2.2.7 Whey Products and Casein

Whey products such as whey powder, condensed whey and whey protein concentrates are produced mainly in major cheese-producing regions, such as Europe, North America and Oceania. The USA produced 0.49 million tonnes of whey powder and condensed whey and 0.19 million tonnes of whey protein concentrates. The EU produced around 1.6 million tonnes of whey powder and 0.11 million tonnes of casein.

## 1.2.3 GLOBAL CONSUMPTION TRENDS OF MILK PRODUCTS

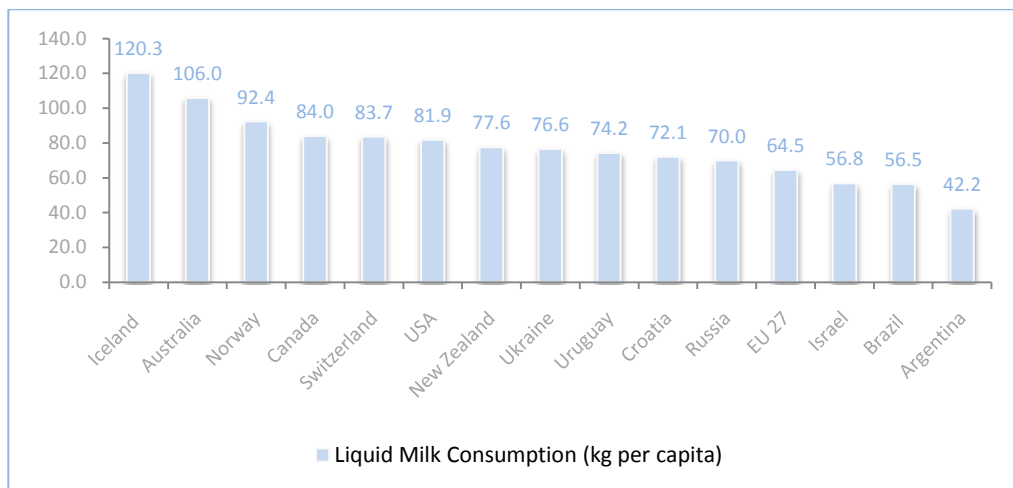
Global milk consumption reached more than 703 million tonnes in 2009, indicating a growth of 21 percent since 2000. With an estimated population of 6.83 billion, global per capita consumption of milk and internationally traded dairy products was 103 kgs and 7.3 kgs respectively in 2009. Consumption by region in 2009 is depicted in Figure 1B. Asia is the most crucial consuming region followed by Europe and North America.

FIGURE 1B: PERCENT SHARE OF CONSUMPTION BY REGION IN 2009



Source: FAO Food Outlook 2010

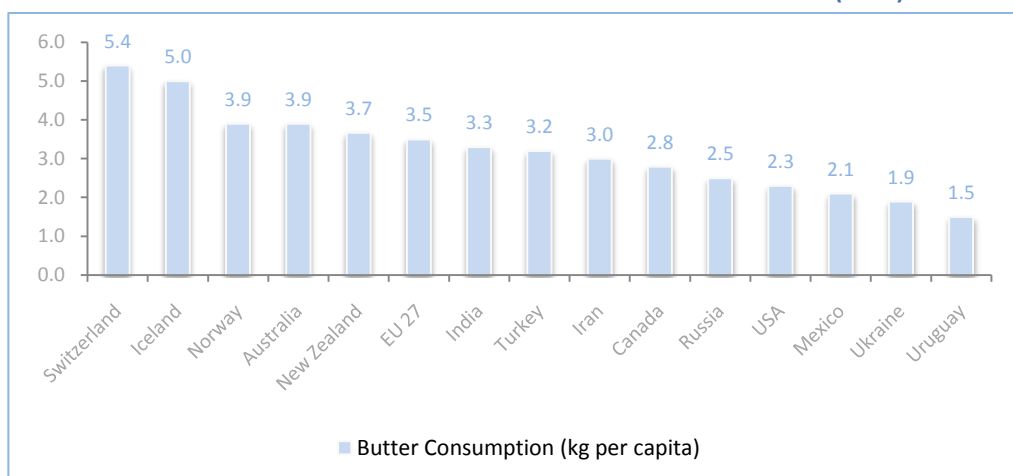
Per capita consumption of liquid milk by country is represented graphically in Figure 1C below:

**FIGURE 1C: PER CAPITA CONSUMPTION OF LIQUID MILK IN SELECTED COUNTRIES (2009)**

Source: IDF National Committees, FAPRI and Eurostat

Note: Russia figures include farm products, New Zealand figures include milk drinks and fermented products

India and China are projected to drive the global consumption of liquid dairy products (LDP), which is set to rise by 30 percent to 350 billion kgs by 2020, according to a report by packaging firm Tetra Pak. The growth will be fueled by rising prosperity and urbanization in Asia, Africa and Latin America. India and China are expected to account for more than one-third of global LDP consumption, with the Asia-Pacific region continuing to consume more than the rest of the world. LDP include milk and other liquid dairy products such as flavored milk, drinking yoghurt, sweetened condensed milk, lactic acid drinks, baby and toddler milk. In India, LDP consumption is projected to rise from around 55 billion kgs in 2009 to around 60 billion kgs in 2013. The selected countries' per capita consumption of butter is graphically represented in Figure 1D:

**FIGURE 1D: PER CAPITA CONSUMPTION OF BUTTER IN SELECTED COUNTRIES (2009)**

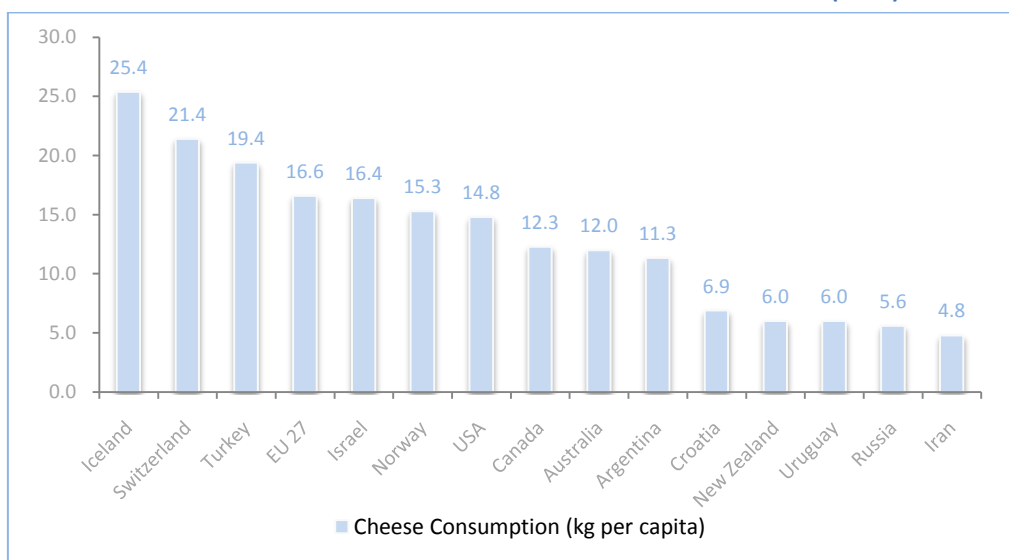
Source: IDF National Committees, FAPRI and Eurostat

Note: Iran figures include blends

Butter is one of the least traded commodities worldwide, when compared to its production volumes. Most of the butter produced is consumed in the same country, with the exception of a few countries such as New Zealand which is more focused on

export markets. USA-based Global Industry Analysts (GIA) reports that the world market for butter is projected to exceed 10 million tonnes by the year 2015. While growth in butter demand in developed countries remains feeble, owing partly to increasing pressure from low-fat alternatives, emerging regions promise brighter growth prospects. The selected countries' per capita consumption of cheese is represented in Figure 1E:

FIGURE 1E: PER CAPITA CONSUMPTION OF CHEESE IN SELECTED COUNTRIES (2009)



Source: IDF National Committees, FAPRI and Eurostat

The outlook for the global cheese market remains bright with consumption of cheese projected to grow by more than 20 percent between 2008 and 2015. Purchasing decisions, increasingly guided by price and health factors, are fuelling consumption of cheese. Consumers are also shifting preferences from imported cheese brands to locally produced cheese. The product mix is poised to change from traditional types of cheeses to new cheeses that suit the demand in developing dairy markets like China and India. The growing demand for dairy products that meet consumers changing diet and nutritional needs will result in strong growth for innovative and healthier cheese products, such as, lactose-free goat cheese products and half-fat and reduced fat cheeses.

Europe and the United States (USA) lead global consumption of cheese. However, consumption levels for cheese in developed markets are nearing saturation. As a result, the focus of the global cheese industry is shifting towards emerging markets such as Asia-Pacific and Latin America. Cheese consumption in developed economies face several challenges, such as a matured market profile, limited growth in population and a fast aging population, which account for lesser per capita consumption than the younger generation. Therefore, any further development in cheese consumption within these markets is likely to be marginal and only associated with changes in form and type of dairy products consumed. At the same time, developing markets such as Asia, Latin America and the combined market of Middle East & Africa, are projected to display superior growth rates over the analysis period

of 2006 to 2015. Large populations and rising incomes in these nations may prove to be the major driving factors for exceptional growth in dairy consumption.

The summary matrix highlighting key dairy products and key producing and consuming countries is presented in Table 1B:

**TABLE 1B: SUMMARY MATRIX DEPICTING THE PRODUCT WISE IMPORTANT PRODUCING AND CONSUMING COUNTRIES**

SR No	PRODUCT	LEADING PRODUCING COUNTRIES	LEADING CONSUMING COUNTRIES (IN TERMS OF PER KG CAPITA)
1	Liquid Milk	EU 27, US, China	Iceland, Australia, Norway
2	Fermented Dairy Products and Milk Drinks	EU 27, China, US	
3	Butter and Other Milk Fats	India, EU 27, US	Switzerland, Iceland, Norway
4	Industrial Cheese	EU 27, US, Brazil	Iceland, Switzerland, Turkey
5	WMP & Semi SMP	China, New Zealand, EU 27	
6	SMP	EU 27, US, India	
7	Condensed Milk	EU 27, South America, USA	
8	Casein	EU	
9	Whey Products	US, EU	

Source: IDF and other sources, YES BANK Analysis

### 1.3 Global Value Chain and Its Characteristics

Few countries are self-sufficient in milk, which means they import more dairy products than they export. Very low self-sufficiency rates in milk (less than 25 percent) are observed in Bahrain, Democratic Republic of the Congo, Côte d'Ivoire, Gabon, Gambia, Ghana, Jamaica, Kuwait, Liberia, Malaysia, Papua New Guinea, Philippines, United Arab Emirates and Viet Nam.

Tradable dairy products comprise of condensed milk, cheese, dry milk products, butter/ghee, which are far less perishable (and bulky) than liquid milk, due to processing. A high share of tradable dairy products in relation to national milk production indicates that a considerable amount of milk passes through the formal sector, but also that the national dairy industry is exposed to competition from other countries in a liberal agricultural trade environment. Globally, countries can be divided into three groups with respect to the shares of milk processed into tradable products:

**High shares (more than 50 percent):** Australia, Belgium, Czech Republic, Denmark, France, Germany, Ireland, Netherlands and New Zealand convert more than 50 percent of their milk production into tradable dairy products.

**Moderate shares (30-50 percent):** Results of around 30 to 50 percent were observed for Argentina, Chile, Estonia, Italy, Finland, Hungary, Iceland, Japan, Republic of Korea, Lithuania, North America, Peru, Poland, Sweden, Switzerland and Venezuela.

**Low shares (less than 30 percent):** In developing countries the share of milk processed into tradable dairy products is low (0 to 20 percent), as seen for instance

in Africa, Asia and countries of Latin America. Low shares have been also observed for Spain, Ukraine and Russia.

About 7.1 percent of world milk production is traded internationally (intra-EU trade excluded). With respect to milk delivered to milk processors, the share traded internationally is 24 percent.

Milk demand is driven by two factors: per capita milk consumption and population. As a general rule, milk consumption is high in developed countries and low in the developing ones, and appears to be particularly low in tropical and subtropical climates. Based on country-specific estimates of per capita milk consumption, the following three categories have been defined:

- High: more than 150 kg per capita/year: Argentina, most CIS countries, Costa Rica, Ecuador, Europe, Honduras, Israel, Lebanon, North America, Oceania, Turkey, Uruguay and others such as Pakistan and Sudan;
- Medium: 30-150 kg per capita/year: India, Japan, Republic of Korea, North and Southern Africa, most countries of the Middle East and Latin America (except Argentina, Ecuador and Uruguay);
- Low: less than 30 kg per capita/year: China, Ethiopia, Yemen and most countries of Central Africa and East and Southeast Asia.

About 60 percent of the world population lives in South, East and South-East Asia, with China and India alone accounting for about 38 percent. Another 14 percent is in Africa. In all these countries (except India, Pakistan and some African countries), milk consumption is generally below 30 kg of milk Mature Equivalent (ME) per capita per year. Western Europe and North America account for 11 percent of the world population, but have an average per capita consumption of approximately 300 kg of milk (ME) per year.

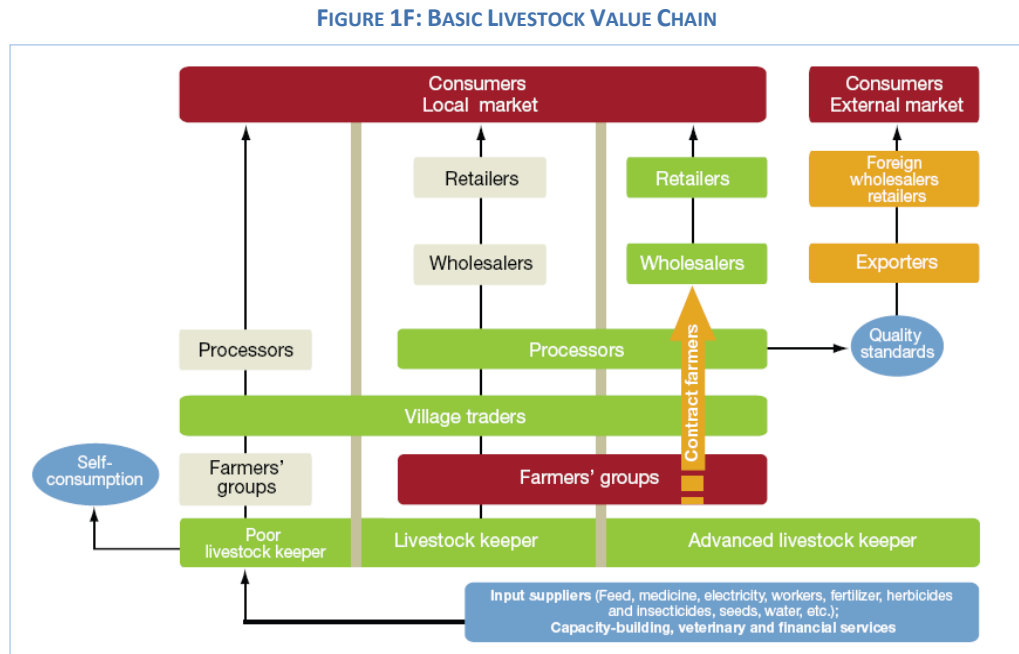
In past years, global milk consumption rose between 10 and 20 million tonnes per year. One driver is human population growth. A global population growth rate of 1.2 to 1.3 percent per year means 75 to 80 million more people each year. Using the world average per capita milk consumption, this would mean that population growth accounts for an increase in milk consumption of 7 to 9 million tonnes per year. The second driver of milk consumption is increasing per capita consumption. This driver depends largely on per capita income gains, especially in developing countries.

The milk value chain can be defined as the full range of activities required to bring milk and milk products to final consumers passing through the different phases of production, processing and delivery. It can also be defined as a market-focused collaboration among different stakeholders who produce and market value-added products. Value chain analysis is essential to an understanding of markets, their relationships, the participation of different actors, and the critical constraints that limit the growth of milk production and consequently the competitiveness of smallholder farmers.



Access to markets and distribution of risks and gains along different steps of milk value chains varies among actors and often depends on such factors as gender. Traditional marketing channels with ad hoc sales are being gradually replaced by coordinated links among farmers, processors, retailers and others.

The basic livestock value chain is shown in Figure 1F:



Source: IFCN

Some of the relevant value chain case studies of key trade countries have been highlighted below:

### 1.3.1 USA

The dairy industry in the USA is valued at more than \$35 billion when measured in gross income at the farm level. Every state in the USA has dairy operations, but higher concentrations are found in California, Wisconsin and New York. Dairy is the most valuable agricultural output in eight states (California, Idaho, Michigan, New Mexico, New York, Pennsylvania, Vermont, Wisconsin) and the second most valuable in another eight states (Arizona, Colorado, Connecticut, Maine, New Hampshire, Rhode Island, Utah, Washington). California is the leading dairy state, accounting for 21 percent of the nation's gross income from milk production. The basic structure of the USA dairy industry is shown in the value chain in Figure 1G. The first column in the chain, "Inputs," refers to the main products and services a dairy farmer needs to run the operation. The "Milk Production" column contains only one type of producer, the single dairy farm on which all the activities take place, from calving and cattle raising through milking and pasteurizing. "Distribution" from milk producers to processors is largely accomplished through marketing cooperatives, some of which also do processing. The final column, "Marketing," refers to supermarkets and restaurants where dairy products are sold.

FIGURE 1G: US DAIRY VALUE CHAIN

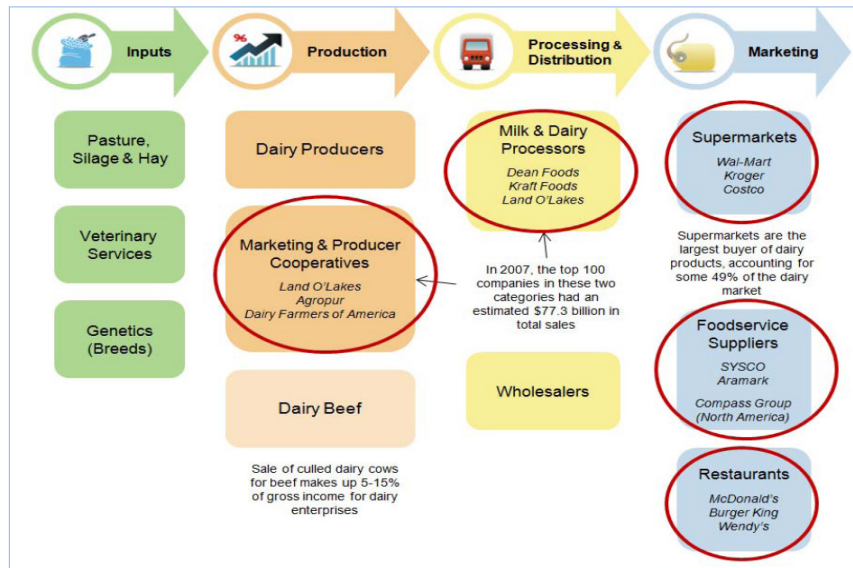


Source: Center on Globalization Governance and Competitiveness, Duke University

#### Value chain description:

- Dairy cattle consume food high in calories, supplemented with roughage and protein. This translates into alfalfa hay, grain or corn silage, and soybean meal provided mainly from dispersed local providers. Many farms also provide much of their own forage or pastureland for grazing and feed. Most producers purchase some feed, especially supplements;
- In recent years wholesale companies have altered the way in which they function in the dairy industry. The concentration of dairy processing and manufacturing firms has become increasingly notable, and many of these firms effectively perform the wholesaler function. Much of the dairy-product sector concentration has been paralleled by the concentration of firms that purchase the products;
- The top five cooperatives by volume are: Dairy Farmers of America; California Dairies, Inc.; Land O'Lakes, Inc.; Northwest Dairy Association, and Dairylea Cooperative, Inc. The top five dairy processors are: Dean Foods Co., Kraft Foods Inc., Land O'Lakes Inc., Schreiber Foods Inc., The Kroger Co., and Dairy Farmers of America, Inc. Some of these companies produce both fluid milk and dairy products. In addition, two of these companies, Land O'Lakes and Dairy Farmers of America, are producer cooperatives. Most milk is marketed as private label products (for example, Kroger or Safeway brand), indicating the importance of local processors and retail companies.

FIGURE 1H: US DAIRY VALUE CHAIN WITH TOP DAIRY COMPANIES

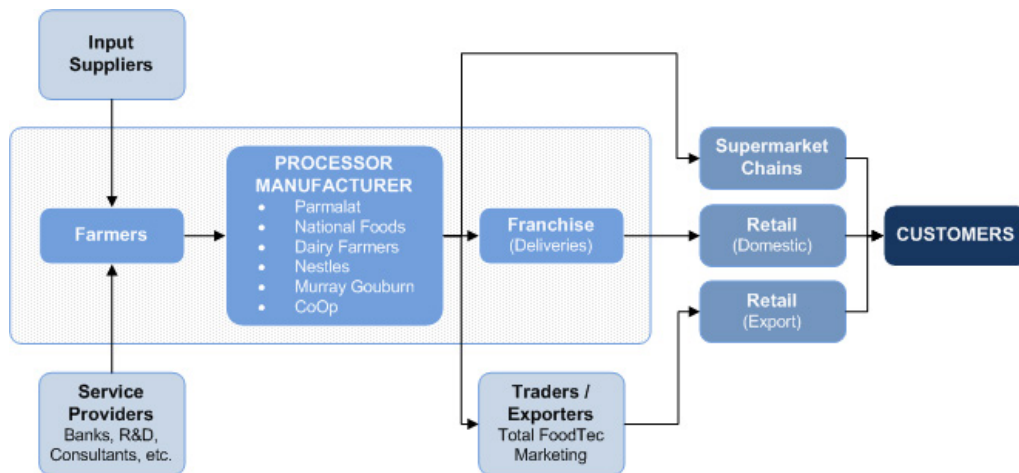


Source: Center on Globalization Governance and Competitiveness, Duke University

1.3.2 AUSTRALIA

The Australian dairy industry has the third highest farm gate value behind wheat and beef production (ADC, 2002) with a total value exceeding A\$3 billion. The components of the dairy value chain are shown in Figure 1I and may vary slightly depending on the processor.

FIGURE 1I: AUSTRALIAN DAIRY VALUE CHAIN



In the Australian dairy industry, the processors are heavily reliant on obtaining a constant supply of quality raw product on a daily basis and supplier agreements are therefore common. For example, 95 percent of the milk supplied to the processor Dairy Farmers is based on supply contracts. Raw milk quality (which is determined on 10 days worth of supply), affects the payments farmers receive for their milk and can lead to bonuses or deductions. Stringent quality testing of the raw milk is conducted both at the farm gate and at the processing facility which requires strict record keeping and electronic trace-back capacity.

In addition, since the industry was deregulated 2000, the major changes to both the production and processing environments have been associated with reducing and controlling costs, improving efficiencies and improving the marketing of goods. It is at the processor level where most of the value adding takes place. For example, Dairy Farmers have approximately 600 product lines nationally.

### 1.3.3 ARGENTINA

Producers in Argentina can be divided into small-, medium- and large-scale. Seven percent of milk production in Argentina is commercialized without going through the “industry” circuit; 75 percent is manufactured into cheese, powdered milk and dairy by-products; and 17 percent is industrialized as fluid milk for human consumption. There is no direct correlation between the production scale and the commercialization channel of milk on the part of the producer.

Supply agreements between producers and processors are specific to each situation and respond to an incentive system according to product quality and process parameters: milk protein content; dairy control (registered animals); bacteriological control; mechanical milking, refrigerated trucks; health of the cattle. At the industrial level, an approximate classification can be made of the companies in the sector (Gutman et al., 2003):

- Great firms with national capital: Mastellone and Sancor;
- Cooperatives: Sancor and Milkaut;
- Multinational firms: Nestlé, Danone, Bongrain, Saputo;
- Medium firms with national capital: Williner, Verónica, Manfrey;
- Small- and medium-scale enterprises (SMEs): over 500 local industries with mainly regional participation.

The Argentine dairy industry is composed of many small-scale processing companies. There are also large and medium “multiplant” and “multiproduct” firms, responsible for the majority of the production. It is estimated that the leading companies (of which Sancor, Mastellone and Nestlé are the most important according to their production value) add up to approximately 51 percent of the reception of raw milk in the country, and their competitive level is as high at the level of raw milk purchase as it is at the level of product sales.

Most of the internal consumption is destined for retail distribution, such as supermarkets, through which 37.4 percent of the sales volume are sold (Nielsen 2007). However, industrial channels and food services (restaurants and catering) are becoming increasingly more important. The dairy industries such distribution a good channel to commercialize their products due to the large volumes they operate with, the logistic costs and the greater certainty of collecting with respect to other channels.

## 1.4 Analysis of Exports and Imports of Dairy Products

In 2009, world dairy trade volume reached 49.8 million tonnes of milk equivalents. This world trade is defined as the total of exports of milk producing countries without trade between EU Member States.

### 1.4.1 CHEESE

The EU remains the leading supplier of cheese to the world market, holding a 31 percent export market share. Leading member states in EU cheese export were Germany (18 percent), the Netherlands (14 percent), France (13 percent) and Italy (12 percent), together representing nearly 60 percent of total EU third country exports. New Zealand is the second largest exporter with an export share exceeding 15 percent. The total export volume of cheese was reported to be 1.85 million tonnes in 2009.

### 1.4.2 WHOLE MILK POWDER (WMP)

New Zealand was the leading supplier of WMP to the world market. New Zealand keeps steadily expanding its markets, particularly in Asia and the Middle East through FTA's with ASEAN, China and more recently, Malaysia and the Gulf Co-operation Council. The total export volumes of WMP was 2.13 million tonnes in 2009.

### 1.4.3 SKIMMED MILK POWDER (SMP)

In 2009, the substantial increase in supply of SMP to the world market was sustained by the export development of all major SMP exporters, except for the USA. New Zealand emerged as the leading supplier to the world market representing almost 30 percent of the world trade volume of 1.33 million tonnes. The major importing countries were China, Indonesia, Malaysia and the Philippines. Besides from New Zealand, major exporters were USA (19percent), EU (17 percent) and Australia (13 percent).

### 1.4.4 BUTTER AND BUTTER OIL

New Zealand remains the world's largest exporter of butter and butter oil representing nearly half of the world trade volume of 0.91 million tonnes. The major destinations for export include Egypt, Belgium, Iran, USA, Russian Federation, Mexico, China and India. The EU remains the second largest exporter exporting to Russia, Northern Africa and Middle East.

## 1.5 Identification of Successful Models for the trade of each product

### 1.5.1 NEW ZEALAND

New Zealand commands a considerable share of world dairy. New Zealand's relatively small population and domestic market for dairy products means that 95 percent of its processed dairy products are exported. Approximately five percent of

world dairy production is traded (excluding trade within the EU). Of this five percent, exports from New Zealand provide one-third. Exports from New Zealand, the EU (34 percent) and Australia (13 percent) provide over 80 percent of dairy products traded worldwide.

New Zealand is the world's largest exporter of butter, skim milk powder and casein, and the second largest exporter of cheese and whole milk powder (excluding intra-EU trade). New Zealand has achieved this position without reliance on production or export subsidies, and without protecting its domestic market from overseas competition.

The New Zealand dairy sector, like its overseas counterparts, is dominated by cooperatives. New Zealand dairy farmers face additional exposure, compared with their overseas counterparts, given New Zealand's remoteness from its key export markets and high shipping costs. Cooperatives help to protect small-scale producers from downstream market power and allow for better coordination of production, distribution, processing and marketing.

There are currently three core companies operating in New Zealand — Fonterra Cooperative Group Ltd, Westland Cooperative Dairy Company and Tatua Cooperative Dairy Company. The milk produced by nearly all New Zealand dairy farmers is supplied to these cooperatives.

Fonterra is the largest of New Zealand's cooperative manufacturing dairy companies. As a leading multinational entity, Fonterra is responsible for around 40 percent of world cross-border dairy trade and a major player in the export of dairy ingredients such as milk powder and casein. Fonterra's international brands include Fernleaf and Anchor, and specialty products such as Anlene (a high calcium, nonfat milk) and Anmum (a milk powder especially formulated for pregnant women). Fonterra has a wide range of international marketing subsidiaries, joint ventures and other arrangements, which include collaboration in the United States (with Dairy Farmers of America), in North America and Latin America (with Nestlé) and in the United Kingdom and Europe (with Arla Foods).

### 1.5.2 USA

The United States (USA) has not been a major exporter of dairy products on a sustained basis. There have been sporadic unsubsidized exports of butter and nonfat dry milk powder over time, but often with the support of subsidies. In 2007-08, the USA was able to take advantage of significant export opportunities due to tighter global stocks, drought-induced production declines in Oceania, rising demand in foreign countries and a weaker dollar in 2007. The USA is also an important importer of relatively large (although mostly fixed) amounts of cheese.

Prior to the conclusion of the Uruguay Round Agreement on Agriculture, the USA employed explicit dairy product import quotas to shield the domestic dairy industry and used federal price support programmes. As a member of the World Trade Organization (WTO), the USA, along with many other dairy-trading countries,

established tariff rate quotas (TRQs) for dairy products. The TRQs allow imports at very low tariffs up to fixed amounts. Any additional imports are subject to very high tariffs. Many of the individual TRQs are administered through licenses for imports of specific products from specific countries or regions.

### 1.5.3 EUROPEAN UNION

In the European Union (EU), the main products made of cow milk are: fresh milk, cheese, yoghurts, butter and milk powder. These dairy products are partly produced for the local market, due to the relative short shelf life of some dairy products like fresh milk, yoghurt and (fresh) cheese. In addition, several products are traded globally, such as butter, cheese and milk powder. The EU dairy industry is dominant in the world market. The EU-25 exports €21 bn worth of milk products to other countries, while Oceania exports amount to €3.8 bn and NAFTA €1.1 bn. The EU-27 is responsible for 72 percent of the total international trade when intra-EU trade and intra-Oceania trade between countries is included, but intra-state trade within the states of the USA and Canada is excluded.

In self-sufficiency there are large differences between drinking milk and eating cheese. For milk most countries have a self-sufficiency of near 100 – a score of 100 means self-sufficient – while in cheese countries vary in their self-sufficiency. Most EU countries had a higher self-sufficiency for cheese in 2005 than in 2000, except the Netherlands, Poland, Portugal and Sweden. Within Europe the self-sufficiency of cheese is low in Greece, Belgium and Spain.

Ireland has the highest self-sufficiency of dairy products in Europe, which is mainly due to the relatively low consumption in the home market. Denmark also has high production. The export of Danish cheese products is mainly to Germany and the United Kingdom. The annual growth figures of the dairy industry and the food industry show that the new EU-12 countries have the highest growth in real value added in the dairy industry. In the southern European countries, except Portugal, the share of dairy industry in the total food industry has decreased. However, in the new entrants to the EU the share of the dairy industry in the food industry increased to above the EU average.

The EU-27 is also the world's largest importer of dairy products, although imports have recently trended downward. This could imply that companies are concentrating on their home markets or that companies are expanding their activities to countries in which they have a large market share. Of the total world export of cheese, 81.5 percent comes from EU-27. Germany, France and the Netherlands together export 45 percent of the total world export in cheese. An important part of this export is intra-EU trade. A total of approximately 18.5 percent of cheese exports of the EU-27 goes to third countries.

Every continent has its own cheese specialty products and the consumers in those countries also prefer specific cheeses. Within continents the favourite types are a commodity, which has implications for the tradability and the prices.

## 1.6 Analysis of the world wide regulations governing the dairy sector trade

Dairy products are mainly consumed in the country or region where they are produced. Despite the technological developments in refrigeration and transportation, only seven percent of the milk produced is traded internationally, if intra-EU trade is excluded.

Trade in dairy products is very volatile, as dairy trade flows can be affected by: (a) the overall economic situation in a country; (b) fluctuations in supply and demand; (c) changing exchange rates; and (d) political measures. Additional volatility is introduced by the concentrated number of buyers and sellers in the global dairy market, leaving it less able absorb to supply and demand shocks.

With demand for dairy products rising in regions that are not self-sufficient in milk production, global volumes of dairy trade are growing. The share of global dairy production that is traded is also expected to increase as trade grows at a faster pace than milk production. Since 1990, a shift in world dairy exports from high export subsidizing countries towards non-subsidizing countries has been taking place.

Developed countries account for 62 percent of the world's dairy imports (measured in milk equivalents) and 93 percent of the exports, indicating that the majority of the global dairy trade takes place among developed countries.

When dairy products are not traded between developed countries, international dairy trade is characterized by the flow of exports from developed countries (EU, New Zealand, Australia and USA) to developing countries (China, Mexico, Algeria, Russia, Philippines and Saudi Arabia). New Zealand exports flow mainly to Asia, while EU exports mainly go to Russia, North Africa and the Middle East, and sub-Saharan Africa. Although milk production is growing rapidly in many developing countries, so is domestic demand. As a result, only a few developing countries, mainly in Latin America (Argentina, Brazil), are expected to become significant exporters of dairy products in the near future.

In many, and predominantly in developed countries, the dairy market is one of the most heavily regulated agricultural markets. Government interventions in the domestic dairy market are most commonly aimed at controlling quantities of production, establishing minimum prices and guaranteeing farmers' incomes. Governments also frequently intervene through public purchases and storage of oversupply or apply policies to foster dairy consumption. In countries where domestic prices for dairy products are supported well above world market prices, the domestic market has to be protected against foreign competition in order to ensure the market outlet for domestic farmers who would otherwise have difficulties to sell their overpriced products. The major policies countries put in place to limit imports are tariffs and tariff rate quotas (TRQs) and other non-tariff barriers. Dairy products are among the agricultural commodities with the highest tariff protection.



The most important measure promoting exports are export subsidies. Under the WTO Agreement on Agriculture, countries that used export subsidies on agricultural products were required to set commitment levels on the volume and value of export subsidies that could be provided. The most significant user of export subsidies on dairy is the European Union (EU), accounting for over 80 percent of the total value of export subsidies on dairy granted during the period of 1995 to 2001. Over the same period values of export subsidies were reduced. By 2001, subsidies for dairy exports were only slightly more than 40 percent of those in 1995.

The major dairy policies for most countries (European Union, United States, Canada, Japan, and South Korea) or major participants in international dairy markets (Australia, New Zealand, Argentina, and Brazil) include income and price support, import restrictions and export subsidies. A few countries also use consumer subsidies to dispose of surpluses or increase demand for dairy products. Support to dairy producers makes up a large share of some countries' aggregate domestic support for all commodities (on average, since 1995, 100 percent for Australia, 84 percent for Canada, 55 percent for the United States, and 12 percent for the EU). In the USA, income support for dairy producers includes direct payments and, in the recent past, ad hoc disaster assistance. Price support measures include government purchase programmes (US), intervention purchasing and storage (EU), and supply management through production or marketing quotas (EU and Canada). (Annexure 1 (i) provides an overview of the main dairy programmes of major countries; Source: USDA).

Most major dairy trading countries maintain tariff-rate quotas (TRQ) for dairy products. TRQs were instituted to maintain and expand imports. They were designed either to keep the same level of import access as before tariffs were introduced under the Agriculture Agreement (current access) or to ensure that there was some increase in access after tariffs were introduced (minimum access), or both. TRQs operate as two-tier tariffs that combine both tariffs and quotas. A relatively low tariff applied to a fixed quantity of imports is coupled with higher tariffs for imports above that quantity. With minimum-access TRQs, access to previously protected dairy markets expanded under the Agriculture Agreement. However, import access for some countries fell below intended levels because fluid milk and some other fresh dairy products were excluded from required minimum access levels. These excluded products account for sizable shares of total consumption in some cases.

Prior to and under the Agriculture Agreement, many of the dairy products exported from the EU, other Western European countries, and Canada were subsidized. The USA also exported most nonfat dry milk (NFDM) and some cheese, whole-milk powder, and butter with subsidies through the Dairy Export Incentive Programme (DEIP). Even Australia and some Eastern European countries, countries not usually associated with export subsidy programmes, have used export subsidies for dairy products. Although export subsidies were reduced under the Agriculture Agreement, they continue to distort international dairy markets.

Production or marketing quotas are used as a supply management tool in Canada and the EU to control milk surplus and to limit government expenditures on dairy products. Because milk production quotas are usually used in tandem with other policy instruments such as price support and import restrictions, they also slow the liberalization of world dairy policies.

Some issues not explicitly addressed in the Agriculture Agreement, like revenue pooling and domestic price differentials, also affect dairy product markets. Revenue pooling allows revenue from higher priced domestic sales to subsidize lower priced sales to export markets. Domestic price differentials that provide a price premium for fluid milk can depress consumption of milk for fluid use and increase the supply of milk for non fluid uses. This leads to artificially low prices for manufactured dairy products, which discourages imports and makes it easier to export.

The potential to reform these policy sets is low, given the possible redistribution impacts and structural changes that could occur throughout dairy supply chains. Capital values that have accumulated under these policies are also large and the significant asset value reductions that would likely occur as a result of the reforms generate significant resistance among stakeholders. These changes could significantly affect producer incomes, employment and local rural economies, and cause governments to seek means of compensation for those who lose in the reform process.

In the context of the WTO negotiations, a useful distinction can be made between those trying to protect their domestic markets (many) and those seeking to increase exports (few). Many of the WTO members are concerned with the very high levels of protection in the developed countries – notably in dairy, sugar and cotton – which are among the most heavily protected sectors. Both domestic support and border protection limit market access to potential exporters in developing countries. In general, these distortions lower world prices making it difficult for milk sectors in developing countries to be potentially competitive in export markets.

In WTO negotiations, the Framework Agreement of July 2004 introduced further reform options for highly supported sectors such as the dairy sector. A critical reform concerns the categories of “sensitive” and “special” products, and how these categories will affect negotiations and subsequent implementation by member countries. For OECD countries in which dairy support is high, dairy products will likely be classified as sensitive products. With such a designation, required tariff formula reductions could be traded against increased market access via tariff rate quota increases.

The designation of special products also offers developing countries a means to protect their respective dairy sectors. It is difficult to anticipate which countries would choose to designate dairy products in this way. However, given that developing countries will be the major drivers of demand, such designation could significantly affect international market growth over the longer term.

### 1.6.1 India

The bound tariff for major dairy products such as butter fat, cheese and fresh milk (fat content more than six percent) is 40 percent. This is low relative many countries with large-scale dairy production. Unlike other major dairy countries, India does not have any special agricultural safeguard provision on dairy products. The applied basic custom tariff is 30 percent for all dairy products except milk powders. For milk powders, the applied basic customs duty is 5 percent for imports up to 10,000 tonnes during the year under the tariff rate quota (TRQ) and is 60 percent for imports beyond the TRQ limit.

Import regulations related to milk and milk products include the following salient features:

- All imported milk products have to conform to the requirements under the Prevention of Food Adulteration Act;
- In addition, milk powders, condensed milks and infant foods must also conform to standards specified by the Bureau of Indian Standards (BIS). According to the procedure for compliance with BIS standards, either the manufacturers/exporters of these products to India are required to register themselves with BIS, or alternatively importers who use the imported items for captive consumption, on a continuous basis and procure them from pre-identified sources can get the consignments cleared if the products comply with the standards, without arranging for certification of the exporting plant by the BIS;
- It is necessary to obtain an animal health sanitary import permit from the Government of India, before importing any livestock products, including milk products;
- At the time of entry into India, all imported food products should have valid shelf life of not less than 60 percent of its original shelf life, with the original shelf life calculated as the difference in date of manufacturing and expiry date;
- Imported food products in packaged form must conform to the requirements under the Standards of Weights and Measures (Packaged Commodities) Rules. Some significant declarations to be made include importer details, common name of the commodity packed, net quantity, date of packing, and the maximum retail sales price;
- Processed food products imported in bulk shall contain a declaration that they do not contain any beef;
- Import of genetically modified organisms (GMOs) and living modified organisms (LMOs) are governed by the provisions of the Environment Protection Act, 1986 and Rules 1989. Further, import of any food, feed, raw or processed, or ingredient of food, food additives or any food product that contains GM material and is being used either for industrial production, environmental release, or field application will be allowed only with the approval of the Genetic Engineering Approval Committee (GEAC). At the time of import all consignments containing products which have been subjected to genetic modification will have to carry a declaration stating that the product is genetically modified.

The Export of Milk Product (Quality Control, Inspection and Monitoring) Rules 2000 set out the requirements related to quality of milk products destined for export and mechanisms to ensure pre-shipment inspection as well as approval of establishments that wish to export. The inspection of food plants is arranged by the Export Inspection Council of India with the help of Export Inspection Agencies.

### 1.6.2 USA

The following Free Trade Agreements (FTAs) are in effect for unrestricted access to the American market:

**AUSTRALIA** - The Australia agreement was approved by Congress in mid-2004 and took effect January 2005. The agreement maintains relatively tight control on imported dairy products. The FTA maintains USA over-quota tariffs, but does allow for some additional in-quota access for Australian dairy products.

**BAHRAIN** - The Bahrain agreement passed Congress by a very large margin of support, largely based on political concerns, given its importance in the Middle East. The agreement was implemented in January 2006. The agreement provides for immediate duty-free access for all dairy products in this country with a small dairy market.

**CAFTA-DR** - The U.S. approved the FTA with Central America and the Dominican Republic in the summer of 2005 and began implementation in 2006. All partner countries also approved and have implemented the FTA. All countries are now in year 4 of the agreement's implementation schedule. This FTA provides immediate access for whey and lactose while creating new TRQs for skim milk powder (SMP), cheese, butter, ice cream and several other dairy products.

**CHILE** - Congress approved the FTA with Chile in mid-2003 and it went into effect in January 2004. The agreement phases out all tariffs on USA dairy product exports to Chile over eight years with some eliminated earlier. It also obligates Chile to remove a requirement that was previously in place to mandate that all U.S. dairy manufacturing plants be individually inspected.

**ISRAEL** - The FTA with Israel took effect in September 1985 and is fully phased-in, however, it does not eliminate all tariffs on all dairy products. In 2004, the deal was revisited and additional in-quota quantities were added to the tariff-rate quota allowances and permitted to grow through 2008. That additional agreement has been extended into 2009 (at the TRQ levels applicable in 2008) as negotiations proceed on how to reach a new agreement and further expand the market access in this FTA. The USA Dairy Export Council is pressing for improved access for a wide range of products, including cheeses.

### 1.6.3 AUSTRALIA

Around half of Australia's annual milk production is sold directly into export markets as manufactured food products and ingredients. At the same time, Australia applies minimal barriers to commercial dairy imports, having had a long-standing free trade

agreement in place with New Zealand. These factors mean that Australian dairy companies and farm gate returns are heavily and directly determined by the prices and conditions prevailing in world markets.

From the dairy sector's perspective, Australia's recently completed FTA agreements meet these principles to varying degrees:

- US (AUSFTA) provides new duty-free access for a range of products, particularly cheese (but often with quota limits). It provides for phased expansions in these quotas but falls short of delivering comprehensive free trade;
- Thailand (TAFTA) provides preferential access for key products (although with restrictive transitional special safeguard volume limits) and the phasing out of tariffs on most products (although against extended time lines for some products deemed sensitive);
- Singapore and Chile FTAs provide comprehensive pathways to free trade; and
- ASEAN provides a mix of tariff preferences and effectively limits WTO ceiling bindings at current applied rates. It reinforces Australia's competitive position in a key region although the gains will be shared with New Zealand).

On balance, these trade agreements are important in terms of protecting and expanding Australia's access to established and growing markets for dairy. In light of the trade deals being put in place by commercial competitors, the negotiation of additional trade agreements with countries and groups such as Japan, China, Korea and the Gulf Cooperation Council are a high priority. Expanding market opportunities through FTAs can also have positive indirect effects on commercial trade. For example, the creation of new profitable market outlets in countries such as the USA can have the effect of strengthening Australia's negotiating position with buyers in third country markets. The increased flexibility in Australia's trading options can lead third country buyers to lock-in improved long-term relationships with Australian suppliers.

#### 1.6.4 JAPAN

Japan is adhering to the commitments in 1995 GATT Uruguay Round Agreement. As for dairy products with tariffs, the commitment of current access import opportunities are being implemented under the tariff quota by private companies and the state trading by the Agriculture & Livestock Industries Corporation (ALIC). As a result, the share of imports exceeds 30 percent against total domestic demand for milk and milk products.

#### 1.6.5 CANADA

Canada remains actively engaged in the World Trade Organization (WTO) negotiations and continues to exchange views and ideas with other WTO members. Their most recent effort has been the formal launch of Canada-EU free trade negotiations.

### 1.6.6 EUROPEAN UNION

Dairy trade is primarily taking place within the internal EU market but, depending on the product, exports are also important. For example, 55 percent of milk in the EU is used for cheese production (giving a production volume of 9 million tonnes), while exports amount only to 600,000 tonnes (equal to six percent of milk production). EU production of Full Cream Milk Powder is about 800,000 tonnes, of which 500,000 tonnes (63 percent) are exported. Imports of dairy products are mostly the result of bilateral trade agreements between the EU and third countries whereby a specific volume can be imported against a reduced levy.

The present EU dairy market regime combines price support, through measures like intervention buying, import tariffs and export subsidies, with milk quotas to limit production levels. The 2003 Luxembourg Agreements on reforms of the Common Agricultural Policy (CAP) retain the quota system until at least until 1 April 2015.

## CHAPTER 2: ASSESSMENT OF THE DAIRY SECTOR IN ETHIOPIA

### 2.1 Profile of the Dairy Sector

Ethiopia has the largest livestock population in Africa, comprising 49 million cattle, 25 million sheep, 22 million goats, 7.58 million equines, 0.76 million camels and 38 million poultry. There were 17.7 million cows and heifers older than three years, out of which 9.9 million (56 percent) were milking cows in 2008-09 (CSA, 2009). This huge resource base indicates that Ethiopia has a large potential for dairy development. The country also enjoys diverse topographic and climatic conditions favourable for dairying.

According to available studies, three major dairy production systems can be identified in Ethiopia: traditional smallholders, private commercial farms, and urban and peri-urban systems (Gebre Wold, et al, 2000).

- The traditional smallholder system, roughly corresponding to the rural milk production system, accounts for about 97 percent of the total national milk production. This sector is largely dependent on indigenous breeds of low productivity (native zebu cattle), which produce about 1.3 kgs of milk per cow per day for an average lactation period of six months. In 2008-09, the estimate of total cow milk produced by private smallholders was 2.8 million tonnes (CSA, 2010). In this production system, most of the milk produced is retained for home consumption. The surplus is mainly processed using traditional technologies and the processed milk products such as butter, ghee, ayib and sour milk are usually marketed through informal channels after households satisfy their needs (Redda, 2001);
- Private commercial dairy farms use grade animals (those with more than 87.5 percent exotic blood) and are concentrated within 100 km of Addis Ababa;
- The urban and peri-urban milk production system includes small- and large-scale private farms in urban and peri-urban areas concentrated in the proximity of Addis Ababa and other regional towns (Felleke and Geda, 2001). This sector is commercial and mainly based on the use of grade and crossbred animals that have the potential to produce 1,120 - 2,500 kgs over a 279-day lactation period. It is estimated that the peri-urban and urban milk system produces about 35 million kgs of milk annually. Of the total peri-urban and urban milk production, 73 percent is sold, 10 percent is left for household consumption, 9.4 percent goes to calves and 7.6 percent is processed into butter and ayib (cheese).

The Ethiopian dairy sector has great national importance. In addition to its contribution in providing nutritious food to the population of the country, it also contributes to the national GDP and generates employment. In 2008-09, the livestock sector contributed 33.5 percent of the agricultural GDP or 11.7 percent to the

national GDP (MoFED, 2010). According to FAO estimates, unprocessed primary milk produced in rural regions (whole, fresh milk of cow, camel, goat and sheep) contributed about Birr 3,585 million (10 percent) to the gross value of livestock products in 2008-09. In terms of employment, about 13.9 million households (holdings) in rural areas have engaged in cattle production activities which includes dairy cattle in 2008-09 (CSA, 2010). Large- and medium-scale dairy processing industries have generated employment for 582 people in 2008-09.

The dairy sector contribution to export is not significant. Ethiopia is net importer of processed milk products.

## 2.2 Analysis of Ethiopian Dairy Sector's Performance during 2000 - 2009

### 2.2.1 PRIMARY MILK PRODUCTION & MILK YIELD

Milk is produced in all agro-ecological zones of the country. Cattle, camels and goats are the main livestock species in Ethiopia. 83 percent of the milk produced is from cattle and the remainder from goats and camels. Table 2A shows the trend of primary milk production and yield per milk cow during the period 2000 – 2009. The production of fresh whole cow milk in Ethiopia has increased significantly over the period, from 900,000 tonnes in 2000 to 1,400,000 tonnes in 2009 (55.5 percent growth). However, the productivity per head of milk cow has fluctuated, though the overall trend was downward between 2000 – 2002, with fluctuations over the remaining period (FAOSTAT, 2011).

In general, milk productivity in Ethiopia is relatively low. The indigenous zebu breed produces about 400-680 kg of milk/cow per lactation period compared to grade animals that have the potential to produce 1,120-2,500 kgs over 279-day lactation period.

**TABLE 2A: TRENDS OF PRIMARY MILK PRODUCTION AND MILK YIELD IN ETHIOPIA DURING 2000 – 2009**

Product	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cow milk, whole, fresh ('000 tons)	900	1,000	1,100	1,050	1,050	1,150	1,200	1,250	1,350	1,400
Camel, goat & sheep milk, whole, fresh ('000 tons)	214	215	232	239	250	273	276	288	288	288
Milk, Total ('000 tons)		1,215	1,332	1,289	1,300	1,423	1,476	1,538	1,638	1,688
Yield of Cow milk (Hg/ cow)	2,073	2040	2037	2,100	2,100	2,169	2,142	2,155	2,109	2,153

Source: FAOSTAT

### 2.2.2 DAIRY PROCESSING

Commercial dairy farms and processing industries recorded an increasing trend over the last decade (1999-2000 – 2008-09). A survey of large- and medium-scale manufacturing industries (CSA, 2010) indicated that the number of large- and



medium-scale dairy processing facilities industries have increased from one public dairy processing plant in 1999-2000 to five (PRIVATE) commercial dairy processing facilities in 2008-09. Their contribution to output, employment generation, value addition and marketed outputs also increased over the same period. Accordingly, the number of people employed by the processing plants has grown from 245 in 1999-00 to 582 in 2008-09.

The growth in gross annual value of production and value added per year over the years 1999-2000 – 2008-09 was more than eleven times compared to the value registered in 1999-2000. The value of fixed assets of these large- and medium-scale dairy processing plants has also increased over the same period as indicated in Table 2B.

**TABLE 2B: PERFORMANCE OF LARGE AND MEDIUM DAIRY PROCESSING INDUSTRIES, 1999-2000 – 2008-2009**

Indicators	Unit	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
No. of Industries	No.	1	2	2	3	3	3	3	3	4	5
No. of Employees	No.	245	435	648	627	757	646	689	760	690	582
Gross value of production	'million Birr	13.6	33.2	40.4	5.50	60.23	68.0	99.0	99.7	100.6	160.0
Annual value added	'million Birr	4.7	10.7	12.6	16.0	24.2	24.0	43.6	34.0	21.0	53.2
Capacity utilization	percent									65.9	72.1
Value of fixed assets	'million Birr						19.0	24.2	40.2	56.0	56.1
Annual value of sales	'million Birr									99.0	158.8
Local markets	'000 Birr									99.0	158.8

Source: CSA, Survey of Large and Medium Manufacturing Industries, 2002-03 – 2009-10

The production of processed dairy products in the country has also shown significant growth in the last decade. Production of pasteurized milk has grown from 3.83 million kgs in 1999-2000 to 16.09 million kgs in 2008-09. The growth in production of butter, ghee and cheese over the same period is significant although fluctuated, as shown in Table 2C.

**TABLE 2C: PRODUCTION OF PROCESSED DAIRY PRODUCTS IN ETHIOPIA, 1999-2000 – 2008-09**

PRODUCTS	UNIT	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	AVERAGE PRODUCER'S PRICE/UNIT (BIRR)
Milk pasteurized	million kgs	3.83	7.38	8.93	10.74	12.17	13.50	16.21	13.46	14.62	16.09	760.00
Butter & ghee	Tonnes	60	922	384	180	339	394	588	354	365	611	47,365
Cheese	Tonnes	11	187	166	140	189	104	122	480	236	270	37,416

Source: CSA, Survey of Large and Medium Manufacturing Industries, 2002/03 – 2009/10

### 2.2.3 EXPORTS AND IMPORTS TRENDS OF KEY DAIRY PRODUCTS

Both the volume and value of Ethiopian dairy exports are low. With insignificant quantity, milk and butter were exported to only a limited number of countries including Djibouti, Somalia, South Africa and the Ethiopian diaspora. The exports and imports of dairy products between 1999-2000 and 2008-09 are depicted in Table 2D and Table 2E respectively.

**TABLE 2D: EXPORTS OF DAIRY PRODUCTS FROM ETHIOPIA DURING 1999-2000 TO 2008-09**

PROCESSED PRODUCTS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Exported Quantity (tons)</b>	<b>45</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>38</b>	<b>191</b>	<b>496</b>	<b>884</b>	<b>473</b>	<b>101</b>
<i>Butter of Cow Milk</i>		1	1	5	19	6	2	11	4	3
<i>Milk products</i>	45	-	-	-	19	185	494	873	469	98
<b>Value of Exported products ('000 US\$)</b>	<b>41</b>	<b>4</b>	<b>3</b>	<b>18</b>	<b>42</b>	<b>47</b>	<b>74</b>	<b>107</b>	<b>68</b>	<b>97</b>
<i>Butter of Cow Milk</i>	1	4	3	18	32	28	13	30	21	17
<i>Milk products</i>	40	-	-	-	10	19	61	77	47	80

Source: FAOSTAT

**TABLE 2E: IMPORTS OF DAIRY PRODUCTS IN ETHIOPIA DURING 1999-2000 TO 2008-09**

PROCESSED PRODUCTS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Imported Quantity (tons)</b>	<b>2,028</b>	<b>1,178</b>	<b>560</b>	<b>1,786</b>	<b>3,463</b>	<b>1,267</b>	<b>1,592</b>	<b>2,330</b>	<b>1,577</b>	<b>2,027</b>
<i>Cow milk, whole, fresh</i>	37	7	-	80	2	4	12	6	8	73
<i>Other form of milk</i>	1,127	1,113	534	1,645	3,274	1,164	1,477	2,178	1,395	1,778
<i>Butter</i>	839	8	4	9	141	16	5	34	23	21
<i>Cream Fresh &amp; Ice</i>	2	12	11	12	9	24	33	33	51	62
<i>Cheese of whole milk</i>	11	12	4	18	18	45	64	77	79	93
<i>Processed cheese</i>	12	26	7	19	19	14	1	2	21	-
<b>Value of Imports ('000 USD)</b>	<b>2,962</b>	<b>2,524</b>	<b>1,530</b>	<b>2,687</b>	<b>9,091</b>	<b>4,637</b>	<b>5,668</b>	<b>8,029</b>	<b>5,911</b>	<b>9,360</b>
<i>Cow milk, whole, fresh</i>	15	4	0	28	2	3	7	4	6	56
<i>Other form of milk</i>	2434	2394	1481	2514	8775	4403	5390	7664	5446	8761
<i>Butter</i>	468	12	6	14	196	33	16	52	64	93
<i>Cream, Fresh &amp; Ice</i>	5	12	12	16	16	31	50	50	79	95
<i>Cheese of whole milk</i>	16	48	13	62	48	111	204	256	255	355
<i>Processed Cheese</i>	24	54	18	53	54	56	1	3	61	-

Source: FAOSTAT

## 2.3 Key Players and Markets of the Ethiopian Dairy Sector

The key players in the dairy business include primary dairy producers, dairy product processors, marketers and support service providers.

- In Ethiopia, primary dairy producers include rural smallholder producers, urban smallholder producers, and urban and peri-urban private commercial dairy farms. As indicated above, rural smallholder farmers produce more than 90 percent of the total national milk production, most of the milk produced being retained for household consumption. The urban smallholders and private commercial dairy farms produce milk and dairy products that are mainly supplied to markets in urban areas;
- Next to primary producers, dairy processing industries are key players of the Ethiopian dairy sector. There are currently five large- and medium-scale dairy processing industries in the country: Lame Dairy PLC, Mama Milk Industry (Sebeta Agro Industry PLC), Family Milk Factory PLC, Lema Dairy PLC, and Dire Dawa Dairy Enterprise. In addition, there are more than ten small- and micro-scale dairy processing industries, including some cooperatives;
- Individual milk collectors, cooperatives and dairy processing agents are the main actors in collection of fresh milk and supply to markets and to dairy processing establishments. Urban areas are the main markets for dairy products. The distribution of milk and dairy products takes place through both informal and formal marketing systems. The informal market involves direct delivery of fresh milk by producers to consumers in the immediate neighborhood or to any interested individuals in nearby towns. The formal milk marketing takes place through milk processing plants which are located in and around Addis Ababa. In addition, farmers' milk marketing groups and dairy cooperatives play a key role for milk marketing outlets;
- Support providers also play a key role in the dairy sector. These include cooperative promotion agencies, agricultural extension providers, marketing agencies, input supplier agencies, micro- and small-scale enterprise development offices, urban and rural administrations, NGOs and development projects. The roles of these key actors are diverse and include: dairy cooperative promotion and legal organization facilitation, facilitation of credit and market for cooperatives, training, technology demonstration and linkage facilitation, manufacturing/purchasing and distribution of inputs and feed use, promoting urban dairy group for income generation, facilitating access to land, infrastructure, and services by dairy producers and processors, improving animal health coverage and artificial insemination (AI) services, improving feeding and husbandry practices, provision of improved and cross bred dairy cattle, and promotion of group milk processing and marketing. SNV Ethiopia and Land O'Lakes Ethiopia are among the main NGOs and projects supporting the development of the dairy sector of the country. Rural financial institutions (Amhara Saving and Credit Institution, Dedebit Credit and Saving Institution, Oromia Credit and Saving Institution, Omo Microfinance, Oromia Cooperative Bank) and commercial banks also provide financial services for urban and rural dairy producers, producer groups, and processors.

## 2.4 Current Feed Supply Systems

Most of the livestock in Ethiopia depends almost entirely on natural grazing lands. Other resources include grazing of fallow lands between crop fields and crop residues from cropping activities.

Natural pasture from communal grazing lands and crop residues have been the main sources of feed for dairy cattle, particularly in peri-urban and rural areas including pastoral / agro-pastoral systems. Crop residues are also the major source of feeds for most areas. In these systems, annual food crops, such as cereals and root crops, are dominant and crop farming is highly integrated with livestock production, particularly with cattle rearing.

Dairy producers in the urban areas mainly use purchased roughage and concentrate feeds along with non-conventional feeds like attella. Hay stacking for the dry period is also practiced by the urban dairy producers. Hay stacking is also the most common feed resource in intra-urban and peri-urban dairy farmers around Addis Ababa. Smallholder dairy producers who live around the periphery of towns and those who keep local cattle in the towns also graze their cattle along the road sides during the dry and wet seasons, respectively. Smallholder farmers that do not have access or space to stack crop residues or hay, incur extra costs for purchasing sugar cane and dry grass during the dry season.

**Improved Forage:** The mixed crop/livestock-system holds the highest potential for the adoption of improved forages. Adoption of forage in dairy farms in mixed-farming systems has taken place in many areas where forage technology has been introduced in association with improved dairy production. Farmers preferred those forage species which are easy to establish, robust and are consumed by their own animals. Among the tested-forage crops, oats, vetch, and Napier grass were selected by farmers. Since shortage of land is the major problem, farmers were interested in producing forage crops through strategies that reduced crop-land competition and replenished soil-fertility. The potential for the adoption of improved forage is high where both livestock productivity and response to improved feed-technology are high, such as with crossbred cows and where production is more market-oriented. In this instance, the potential for adoption is high because of the possible complementarities between regular cash-income generation from dairy sales and the opportunity for intensification of crop production.

**Crop Residues:** The contribution of crop residues to the feed budget in the crop/livestock farming systems is important. At present, crop residues are the second most important feed resources available to dairy cattle. While they are generally used after each harvest of each season, crop residues may be the only source of feed for dairy cows over a period of one or two months (at the end of the long rains after harvests) when natural pasture is drastically reduced. Although teff straw is the most abundant, bean and wheat straws are also used. Most farmers collect and store their teff straw. Other residues are sometimes grazed on site, but there is considerable loss from trampling wastage.

**Concentrate Feeds:** Concentrate feed-ingredients are mainly used by dairy farmers for supplementing roughages and for balancing the dairy-ration formula. Dairy farmers use agro-industrial by-products such as brewery residues, wheat bran and middling, oilseed cakes (cotton and sesame), and mineral mixtures and molasses to supplement their milk production cows.

Feeding home-mixed concentrates using flour-mill by-products and/or oilseed cakes dominate in the urban and peri-urban dairy production systems. Among the non-conventional feeds, atella (a traditional home-brewery residue) and pulse hulls are also utilized by dairy farmers.

Commercially-prepared, balanced, dairy cattle concentrate feeds of good quality are sold by a number of feed mills. There are about 14 commercial animal feed facilities in Ethiopia. According to Central Statistics Agency (CSA), these facilities produced about 16,780 tonnes of concentrate feed in 2008-09. However, the high price of the concentrates makes them unaffordable to small-scale dairy producers. They are mainly used by urban dairies.

Insufficient feed quantity and poor nutritional quality contribute to low milk yield. Many stakeholders stated that shortages of feed supply have increase prices and led to the high cost of production for dairy farms. This has forced some of the dairy farms to close down.

## 2.5 Current Milk Collection Systems

Dairy products in Ethiopia are channeled to consumers through both formal and informal dairy marketing systems. The informal system is characterized by low cost of operations, high producer price compared to the formal market and no regulation or licensing of operations. The traditional processing and marketing of dairy products, especially traditional soured butter, dominate the Ethiopian dairy sector.

Formal milk markets are limited to peri-urban and urban areas, such as Addis Ababa and other urban centres. The formal market appears to have expanded during the last decade with the private sector entering the dairy processing industry in and in the periphery of Addis Ababa, Dire Dawa and Dessie towns. About five large- and medium-scale private milk processing industries including Lame Dairy PLC, Mama Dairy (Sebeta Agro Industries PLC), Family Milk PLC, Lema Dairy PLC, Bora Dairy, Dire Dawa Dairy Enterprise), collect milk for processing from large commercial farms, from smallholder producers through collection centers and from dairy cooperatives. Other small-scale processors and dairy cooperatives also process dairy products by collecting fresh milk from individual smallholder dairy producers, from individual collectors, from cooperatives and from commercial dairy farms. The large- and medium-scale dairy processing plants have chilling facilities at all collection centres. The collected milk reaches the processing plant within 24 hours. Processors have their own transportation system with cold storages and refrigerators.

Individual milk collectors also supply fresh milk to cafe's, institutions and restaurants that are based in Addis Ababa and other urban centres. Individual collectors use their own transportation system to deliver the milk.

## 2.6 Investment Trends in the Ethiopian Dairy Sector

A large number of investors have invested in the dairy businesses in Ethiopia since the enactment of investment policy in 1992. From 1992 to 2010, a total of 1,201 projects were registered or licensed in the dairy business, out of which about 200 were foreign direct investment projects. The regional distribution of these dairy businesses show that about 600 (50 percent) projects are in Oromia, 200 (17 percent) projects are in Amhara, 115 (10 percent) projects are in SNNP, 90 (7.5 percent) projects are in Addis Ababa, and the remaining in the Tigray, Dire Dawa, and Harari regions.

However, only 99 (8.2 percent) of the investment projects were operational by the end of 2010, totaling Birr 358 million worth of capital and generating 2,041 jobs (see Table 2F for details). The remaining 71 projects remain under implementation, while 1,031 projects have not progressed into action on the ground. Out of the operational projects, 37 are in Amhara, 28 are in Oromia, 15 are in Tigray, 8 are in SNNP, 5 in Addis Ababa and 5 in Dire Dawa.

**TABLE 2F: SUMMARY OF LICENSED DAIRY PRODUCT INVESTMENT PROJECTS, 1992-2010**

Status of projects	Domestic	Foreign	Total
<b>1. Operational</b>			
1.1 No of projects	92 (9 percent)	7 (3.5 percent)	99 (8.2 percent)
1.2 Capital (million Birr)	139.0	219.0	358.0
1.3 No of Employment	1,506	535	2,041
<b>2. Implementation</b>			
2.1 No of projects	59	12	71
2.2 Capital (million Birr)	100.5	761.9	862.4
2.3 No of Employment	1,234	5,375	6,609
<b>3. Pre-implementation</b>			
3.1 No of projects	847	184	1,031
3.2 Capital (million Birr)	2,492.5	7,650.9	10,143.4
3.3 No of Employment	19,555	38,412	57,967
<b>Total</b>			
2.1 No of projects	998	203	1,201
2.2 Capital (million Birr)	2,732	8,631.8	11,363.8
2.3 No of Employment	22,295	44,322	66,617

Source: Ethiopian Investment Agency, 2010

Despite its large size and favorable business environment, the dairy sector in Ethiopia does not contribute substantially to the national income. The investment in the sector remains limited due to infrastructure and technical constraints; inadequate research and extension; and lack of policies relevant to development of the dairy industry. As a result, the Ethiopian dairy sector is less developed than its counterparts in neighboring countries with similar agro-climate conditions, like Kenya and Uganda, where smallholders also dominate dairy production.

## 2.7 Assessment of Current FDI and Possibility of Attracting Fresh FDI

In recognition of the role of the private sector in the economy, the Government of Ethiopia revised the Investment Code more than three times over the last eighteen years to make it more transparent, attractive and competitive. Major positive changes regarding foreign investments were introduced through Investment Proclamation No.280/2002 and Regulations No.84/2003 (as amended). As a result of the implementation of these policies and strategies, agricultural and industrial production as well as exports are growing steadily on a year-to-year basis in terms of variety and volume.

Due to the investment-friendly environment created in the country, the inflow of foreign direct investment (FDI) has increased substantially over the last eighteen years. China, India, Sudan, Germany, Italy, Turkey, Saudi Arabia, Yemen, the United Kingdom Israel, Canada and the United States are all major sources of FDI. The number of investment projects licensed has grown from 44 projects in 1999-2000 to 1,156 in 2006-07. The amount of capital investment registered by FDI in recent years had also increased considerably. The capital registered annually by newly licensed FDI projects has increased from 1.16 billion Birr in 2001-02 to 47 billion Birr in 2006-07. The capital registered annually by new FDI projects that become operational increased from 2001-02 to 2003-04, but dropped after 2004.

However, the number of FDI projects in the dairy sector since 1992 is not significant when compared to domestic projects; FDI is only 17 percent of the total investments made in the dairy sector. This suggests that there is room to attract additional FDI, particularly to the medium- and large-scale dairy processing businesses.

## 2.8 Pros and Cons of Globalization and Trade Liberalization on the Ethiopian Dairy Sector

Since 1992, Ethiopia has undergone a series reform packages pervading all aspects of the economy in line with the IMF and World Bank recommendations. As a result of the reforms, the economy has performed well during the last seven years, as measured by the GDP. This sustained double digit growth is the highest registered in the country's economic history and is the highest among non-oil producing African countries. Economic growth was registered in all sectors of the economy: agriculture, industry and the services sector. The agricultural sector has grown both in terms of cultivated land and production.

The dairy sub-sector is among the Agro-Industries that has shown steady growth since the implementation of the reforms. Accordingly, milk production has grown during the post-reform period at an annual rate of 2.19 percent (FAO, 2001). Market-orientated reforms encouraged the privatization of publicly-owned plants. By the end of 2012, five private dairy processing plants were established. There are also a number of formal and informal small- and micro-scale dairy businesses in the

country. An increase in the price for whole milk encouraged new producers to become involved in dairying.

Major events were the devaluation of the currency, a new land-policy, and a policy on agriculture-led industrialization. Some studies show that the commercialization of processed dairy products through supermarkets has also expanded and is expected to keep doing so in the foreseeable future as a result of globalization and trade liberalization. Increasing urbanization and corresponding changes in consumer preferences and purchasing power were highlighted as reasons for the rise of supermarket-processor dairy chains.

However, economic insecurity caused by recent global financial crises is affecting the Ethiopian dairy sector. Inflation and frequent devaluations of the Ethiopian Birr have put a burden on dairy farmers who rely on machinery imports. The current situation discourages is new entrants.

## 2.9 Assessment of Current Trade and Investment Policies on the Sector

Ethiopia's trade and commerce is governed by the 1960s Commercial Code developed during the Imperial era. However, many aspects of trade and commerce have changed since its promulgation. The subsequent regimes implemented trade policies and strategies that served their ideologies within the framework of the Commercial Code. The Derge (1974-91) pursued a centralized socialist-inspired trade policy that made little provision for private involvement. The Ethiopian People's Revolutionary Democratic Front (EPRDF) (1992-93) introduced radical reforms to the business environment to facilitate private entrepreneurship, which paved way to a market-oriented economic development strategy. These included economic reforms that encompassed price deregulation, import tariffs reduction, abolition of export duties, financial sector reform and promotion of private investment.

No separate policy and strategy was developed to focus solely on trade policy. The trade instruments of the country are embedded within various policy and strategy documents, which include: rural development policies and strategies; industrial development policy; and the investment policy.

Ethiopia promulgated the *Trade Practice Proclamation No. 329/2003* to promote free commercial competition and prohibit anti-competitive practices.<sup>1</sup> Commercial registration and business licensing provisions are addressed under Proclamation No.67/1997 and the Council of Ministers Regulation No.14/1997.

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<sup>1</sup> Anti-competitive practices include: price fixing, collusive tendering, market or consumer segmentation, allocation of quota of production and sales, and consented refusal to deal or sell.



Ethiopia has a liberal investment policy in which both domestic and foreign investors can operate. A comprehensive investment code was established under Proclamation No. 37/1996.

## 2.10 Analysis of Domestic Regulations and Laws at Various Stages of Value Chain

Development policies adopted by the Government of Ethiopia have differed in form and have had varying degrees of effect. Enacted proclamations and regulations in dairy and dairy-related development initiatives in Ethiopia include the following:

- Proclamation to provide for the control of animal diseases of 1961;
- Proclamation to provide for the establishment of the institute of agricultural research of 1966 and the subsequent reorganization and amendment in 1997 and 2004 respectively;
- Order for the establishment of the dairy development Agency of 1971;
- Proclamation for the establishment of joint venture of 1983;
- Proclamation to provide for the establishment of the Livestock and Livestock Products Marketing Authority, which later on dissolved and merged into Ministry of Agriculture; and
- Proclamation for the establishment of the national investment policy of 2002.

Regulations, acts and standards which are relevant for the livestock sector and have implications for the dairy sub-sector development were also enacted. These include: cattle milk research strategy; animal health research strategy; animal feed and nutrition strategy; public health act; cooperative statute; standard enforcement; land act; and animal diseases act.

However, the existing raw milk quality standards for Ethiopia and the Common Market for Eastern and Southern Africa (COMESA) have not been enforced. There is no regulation to prevent the sale of raw milk, hurting pasteurized milk sales as a result. In addition, there is no specific regulatory body for the dairy sector. Currently, there is a quality control and supervision problem at all stages of the value chain.

Recent policies and strategies that have long-term implications on dairy development include the Agriculture and Rural Development Policy and Strategy (ARDPS), the Agricultural Development-Led Industrialization (ADLI), and the Poverty-Reduction Strategy. The Agricultural Development-Led Industrialization strategy focuses primarily on: agricultural-development with the objectives of attainment of food self-sufficiency; improvement in the quality of life of the rural population through employment creation; poverty-reduction; improved nutrition; and reversing ecological-degradation.

It is envisaged that the ADLI strategy can be implemented through the improvement of productivity in small-holdings and the expansion of large-scale farms, particularly in the lowlands. The Rural Development Strategy focuses on the use of available

resources for maximum production on market-oriented development of the different product sub-sectors through packages of technology and human resource development.

In order to encourage, promote and expand private investment, the Government established the Ethiopian Investment Authority (EIA) and regional Investment Bureaus. The EIA, in addition to the issuance of investment permits, provides one-stop investment services such as the provision of trade registration and operating licenses for private investors, granting of work permits to expatriate employees and facilitating the acquisition of land and utilities by private investors.

The Ethiopian Government further revised the investment code in order to encourage the private sector to invest in most areas of the economy. Investors are eligible for various investment incentive packages. Special incentive sectors and sub-sectors include agricultural development and agro-processing, agricultural production, manufacturing of equipment and machinery, spare parts, components and supplies, vehicle bodies, other products and assembly plants, and publishing of printed goods. Large-scale road and building construction and other related works are also included. Rural transportation facilities and the purchase of spraying machinery, trucks fitted with refrigeration facilities, or other equipment for support services are also eligible for special incentive facilities.

To encourage private investment and promote the inflow of foreign capital and technology into Ethiopia, investors that meet requirements may qualify for:

- 100 percent exemption from the payment of import customs duties and other taxes levied on importation of capital goods, such as plant and machinery, equipment and spare parts worth up to 15 percent of the value of the imported investment capital goods;
- Exemption from payment of any export tax levied on Ethiopian products and services destined for export;
- A profit tax holiday for 5 to 7 years; and
- Exemption from payment of tax on remittance of capital.

## 2.11 Analysis of Research and Development Facilities

Formal research and development (R&D) efforts for dairy sector development began in the late 1940s and continue to the present, mainly through donor-financed dairy and livestock development projects. A close scrutiny of different project, policy and research documents reveal that they are mainly supply-driven initiatives, emphasizing the transfer of technology and public provision of inputs and services.

Various national and regional research institutions have engaged in dairy and feed research activities. The Holleta Agricultural Research Center, Melkassa Agricultural Research Center, Debre Zeit Agricultural Research Center, Adami Tullu Research Center, Bako Agricultural Research Center, and Werer Agricultural Research Center

are engaged in breed improvement, forage development, animal health service improvement, on-farm crossbred heifer and improved forage demonstration, and milk processing technology and equipment demonstration works. Faculties of Animal Science and Veterinary Medicine of national universities (such as Haramaya University and AAU), the National Veterinary Institute and the ILRI also undertake animal health research, vaccine production, and dairy and forage research activities respectively.

Some evidence shows that national dairy research systems have generated useful technology, knowledge and information over the past decades, particularly in areas such as genetic improvement, fodder and feeds development, nutrition and feeding strategy, animal health and vaccine, and milk handling and processing technology (Azage et al. 2006). However, this has had limited impact on the development of smallholder dairy producers in the country. Historically, non-technical issues have received little attention by the national dairy and feed research. An inventory of the dairy and forage-related research activities of the different research centres revealed that research continues to focus on technical issues.

## 2.12 Analysis of Domestic Infrastructure

There is an adequate network of roads in the major dairy producing areas. However, feeder roads used by smallholders to take their milk to the main milk collection centers and markets are poor. Various studies have shown that farmers face difficulty in transporting their produce including dairy products from farm gate to markets and/or dairy products collection centers.

A limited number of cooling facilities, inadequate means of transport, and poor communication aggravate the difficulties of collecting and preserving locally produced milk, particularly at the level of stallholder dairy producers and collection centers. This leads dairy producers and processors to the relatively high marketing costs for liquid milk and the risk attached to marketing perishable products.

For those actors located on main roads and in the periphery of big towns, the problem of infrastructure is not as immediate. Most of the large- and medium-scale dairy processing industries have chilling facilities at milk collection centers, adequate transport vehicles with cooling facilities to transport milk from collection centers to their own factory gate. However, the small-scale processors, milk collectors and dairy cooperatives lack such facilities. The action of pooling, especially pooling of milk collection and transportation activities, have the potential to mitigate costs.

Ethiopia relies on its airports and close links with its neighbors for access to the outside world. The government is determined to improve infrastructure links in all areas, to further open up the economy to international trade and investment. On the ground, there are moves to develop internal transportation systems. This could lead private sector operators to select a region of their preference and invest where facilities and transportation are well organized.

## 2.13 Analysis of Available Services for the Sector

In Ethiopia, various support services are available for the dairy sector. These include: artificial insemination (AI), veterinary and pharmaceutical service and financial services. The government is the main provider of these services.

### 2.13.1 ARTIFICIAL INSEMINATION AND EXTENSION SERVICES

Crossbreeding service is provided to dairy producers through Artificial Insemination (AI) and distribution of improved breeds from cattle improvement and multiplication centres. This service is monopolized by the Ministry of Agriculture and Regional Bureaus of Agriculture. However, these services are inefficient and ineffective. In addition, crossbreeding using improved bulls is also a major source of crossbred cows in the urban and peri-urban areas. Currently, in vitro production of crossbred embryos at the EIAR-Holleta biotechnology laboratory and training of staff is being undertaken.

Extension services on cattle husbandry management and feeding is also provided by the Federal Ministry of Agriculture and Regional Agriculture Bureaus which also includes practical training and advice. Emphasis is currently being given to training AI technicians drawn from both government staff and farmer producers at the woreda level.

### 2.13.2 VETERINARY AND PHARMACEUTICAL SERVICES

Provision of veterinary service encompasses basic animal health education; treatment and vaccination; laboratory diagnosis; and sample collection for regional laboratories. In addition to clinical-based services, technicians are involved in mobile clinical services on a call basis and vaccination campaigns.

There are six organized Faculties of Veterinary Medicines and one National Veterinary Laboratory in Ethiopia. These faculties produce skilled human resources that meet the demand of producers. The National Veterinary Institute produces over 14 different bacterial and viral vaccines against various infectious animal diseases. The faculties are also sources of part-time animal health professionals that serve the dairy producers and accounts for 18 percent of clinical service and 4.7 percent of drug provision during treatment.

Veterinary services are provided by veterinarians and vet technicians of the Woreda Office of Agriculture in each region. Currently, some private veterinary service providers also operate, particularly in peri-urban and urban areas. Private veterinary service providers are preferred by producers for their timeliness and availability for home services.

### 2.13.3 MARKETING SERVICES

Poor infrastructure is a leading constraint to smallholder farmers being often unable to sell all their milk during the flush season. Moreover, milk markets are not well-organized and farmgate milk prices are unstable due to lack of contracts between

milk producers and the milk collectors. Dairy marketing cooperatives play a significant role in providing the marketing service by buying milk from members and non members, processing and selling products to traders and local consumers.

Federal and regional cooperative agencies assist in organizing dairy cooperatives and in linking them to markets and dairy processing industries. NGOs such as SNV Ethiopia, Land O'Lakes Ethiopia and VOCA Ethiopia also support primary dairy producers and dairy processors with technical assistance, training courses and funds, in addition establishing market linkages. Cooperatives unions, milk producers and processors associations and the Animal Feed Industry Association also support value chain actors by facilitating market access.

## 2.14 Analysis of Financial System and Access to Finance for Key Stakeholders

There are number of financial institutions in Ethiopia, including commercial banks, development banks, micro-finance institutions and insurance companies. Commercial banking functions are performed by the state-owned Commercial Bank of Ethiopia (CBE) and an increasing number of private banks. The Development Bank of Ethiopia grants loans for long-term investments, especially to sectors privileged by policy.

### 2.14.1 Commercial Banks

The CBE and private commercial banks offer savings and checking accounts, short-term loans, foreign-exchange transactions and money transfer services. They also participate in equity investments, provide guarantees and perform other commercial banking activities. Sixteen banks were operating in Ethiopia in 2009 – 3 public and 13 private. These include the two specialized state-owned banks: the Development Bank of Ethiopia (DBE) and the Construction and Business Bank (CBB). The DBE, with its 32 branches, extends short-, medium- and long-term loans to development projects, including industrial and agricultural projects.

The CBB has 27 branches and provides long-term loans for the construction of factories producing housing construction materials and the construction of private schools, clinics, hospitals, and real estate development. Private banks operating in the capital and other major cities are Abyssinia, Awash, Nib, Berhane, Buna, Cooperative Bank of Oromia, Dashen, Lion, Oromia, United, Wegagen, Zemen and Abay. However, the involvement of commercial banks – both government- and private-owned – in dairy sector credit provision is limited to large-scale investors. These commercial banks are involved in credit provision services through government incentives for special programmes.

For any loan, banks demand marketable collaterals as security. According to a number of dairy sector managers, not all banks consider machinery and livestock as collateral for the dairy processors.

### 2.14.2 MICRO FINANCE INSTITUTIONS

In addition to banks and insurance companies, micro-finance institutions (MFIs) play an important role in providing credit and saving facilities for micro-enterprises. Micro Finances Institutions (MFIs) have flourished after the issuance of Proclamation 40/1996, which provides the establishment, licensing and supervision of MFIs. There are approximately 29 MFIs in Ethiopia. Regional government-affiliated saving and credit organizations, NGO-affiliated MFIs and the Cooperative Bank of Oromia (CBO) are the major rural financial service providers for smallholder dairy development in the country.

For smallholders, MFIs are the most suitable source of finance. However, there are several constraints that continue to limit the amount of funds accessed. The amount of cash loaned is often not sufficient for small-scale producers to invest in the development of their farms. Rural producers have difficulty accessing MFIs given their distance from farms and completing loan applications is often a long and complicated procedure.

### 2.14.3 INSURANCE COMPANIES

Most private banks are partnered with insurance companies. There are thirteen insurance companies – one public and 12 private – in Ethiopia. Most insurance companies do not have suitable insurance policies for livestock. In addition, national insurance companies have not developed insurance products to cover the needs of the dairy sector such as potential losses due to natural disasters or to cover loss or spoilage of milk during transport and storage.

### 2.14.4 NGOS

Effort is being made by Land O'Lakes to collaborate with three private commercial banks – Bank of Abyssinia, Awash International, and Dashen – that are Development Credit Authority (DCA) partners with USAID. Land O' Lakes provided training to the banks' lending officers to improve their understanding of the dairy sector, particularly dairy processing. Training focused on investment requirements, cash flow expectations, and potential returns on investment. It also covered 50 percent collateral for those interested borrowers and constrained by lack of collateral. The banks, however, state that they are constrained by a lack of capital, limiting their ability to provide loan.

Netherlands Voluntary Services (SNV) also provides access to three kinds of funds: research and study; leverage; and financial intermediation to finance those intervention areas in the selected four agricultural and agro processing value chains, of which milk is one. The objective of the leverage fund is to enable producers and their organizations to buy business development services and business development service providers to sell relevant services to producers.

## CHAPTER 3: DETAILED MAPPING AND PERFORMANCE ANALYSIS OF THE INDUSTRIES OF THE SELECTED PRODUCTS

### 3.1 Mapping of Existing Dairy Processing Industries

The analysis has been done for two categories of dairy processors, large- and medium- scale processors and small-scale processors. The details of the analysis are presented in the following sub-sections:

#### 3.1.1 LARGE- AND MEDIUM- SCALE DAIRY PROCESSORS

Large- and medium-scale dairy processing industries are characterized by their investment in new and automated technologies. The majority of their output is pasteurized packed milk. All large- and medium-scale dairy processors are considered as formal milk market actors. The formal milk market has expanded over the last decade with the private sector entering the dairy processing industry around Addis Ababa and Dire Dawa. The list of these dairy processing plants, geographical location and daily capacities of production is presented in Table 3A below:

**TABLE 3A : OVERVIEW OF EXISTING LARGE AND MEDIUM SCALE DAIRY PROCESSING INDUSTRIES**

Sr No	Name of Industry	Geographic location	No of employees	Total Production capacity (in '000)	Current attained av. capacity (in '000)	Capacity utilization (percent)	Volume (million kgs)	Value ('million Birr)
1	Lame Dairy PLC (DDE - Shola)	Addis Ababa	34	60	35	58	9.44	99.5
2	Sebeta Agro Industry (Mama)*	Oromia, Sebeta	*	40	30	75	*	*
3	MB. PLC (Family milk)	Addis Ababa	31	10	6	60	1.54	16.27
4	Lema Dairy PLC*	Oromia, Debre Zeit	*	10	6	60	*	*
5	Ada'a Dairy Cooperative	Oromia, Debre Zeit	64	15	4	26.7	0.48	4.52
6	Holland Dairy PLC	Oromia, Debre Zeit	52	8	2.6	32.5	0.24	6.30
7	Genesis Farm	Debre Zeit	15	5	3	60	0.32	3.72

Source: Company Survey, Feb. – March 2011

\*The industries were not responsive to requests for industry data although contacted during assessment.

Details of selected large- and medium-scale dairy processing plants are presented below.

#### Lame Dairy PLC

Formerly known as Shola Dairy Development Enterprise, the newly renamed Lame Dairy PLC was recently privatized. The enterprise does not have its own dairy farm to produce raw milk, but collects milk for processing from large commercial farms, dairy

cooperatives and smallholder producers at collection centers through 25 milk collection centers and chilling stations located around Selale, Holeta, Debre Brihan, and Debre Zeit areas. The enterprise has a laboratory for testing the quality and hygienic condition of milk collected from suppliers.

Lame Dairy PLC has the capacity to produce 60,000 kgs of milk per day, but only utilizes 58 percent of its capacity. The reasons for low capacity utilization are management problems, use of out-dated machineries, financial difficulties and unstable and low consumption of processed dairy products. The products processed and sold include pasteurized milk, butter, soft cheese, yogurt, cream milk, and ayib. All processed products are sold in local markets in Lamberet, Kazanchis, Kera, Piazza.

### **Sebeta Agro Industries PLC (Mama Milk)**

Sebeta Agro Industry is a privately owned processing company. It has a processing capacity of 40,000 kgs per day, but utilizes only 75 percent of its production capacity. It sources about 6,000 – 10,000 kgs of raw milk from its own dairy farm. The company also collects raw milk from smallholders and cooperatives within a 100 kms radius located around Debre Tsigie, Chancho, Sululta, Debre Zeit and Sebeta areas.

The main products of Sebeta Agro Industries include: pasteurized milk, skimmed fresh milk, butter, and cheese. Sebeta Agro Industry uses quality standards such as Hazard Analysis of Critical Control Points (HACCP) in the processing and distribution of its products. It has established the first ultra-high temperature (UHT) dairy processing facility in the country. The new production lines will produce 500 ml carton pouches (Tetra Fino Aseptic) and 250 ml portion packages (Tetra Brik Aseptic). New production lines produce 500 ml carton pouches (Tetra Fino Aseptic) and 250 ml portion packages (Tetra Brik Aseptic). UHT products are aseptically processed and packed and have a shelf-life of 6-12 months without the need for cooling during storage and transportation. Sebeta Agro Industries operates the brand name of “MAMA” and the products are sold in local markets through their shops and distribution network to supermarkets and hotels.

### **Family Milk Factory (MB PLC)**

Family Milk Factory is owned by MB PLC and is located in Addis Ababa. It has processing technology imported from Israel. The plant has a production capacity of 10,000 kgs per day, but currently utilized only 60 percent of its production capacity.

The factory collects raw milk for processing from individual stallholder producers and private farms (10 percent) and dairy cooperatives (90 percent). The factory transports milk from collection centers to the factory and from factory gate to marketing sites using vehicles with cooling capacity. It also has a small testing laboratory. The products of Family Milk include pasteurized milk, butter (cooking and unsalted cup), cheese (various forms) and cream cheese. Pasteurized milk is packed in ½ liter plastic bags, butter is packed in 100 gms unsalted cup and 200 gms unsalted butter plastic paper, and cream cheese in 300 gms and 600 gms cup. The products are sold in domestic markets through supermarkets and client customers.



### **Lema Dairy PLC**

Lema Dairy PLC is privately owned and located in Debre Zeit town of Oromia Region 45 kms from Addis Ababa. During a visit to the processing plant in Debre Zeit, it has been observed that the processing plant is inactive. Lema Dairy receives raw milk from individual smallholder producers, private dairy farms (Genesis Farm), and dairy cooperatives. It has a daily production capacity of 10,000 kgs of processed dairy products, but utilized only 60 percent (6,000 kgs per day) of its production capacity. The performance of the processing plant has now declined; it closed its dairy farm due to escalated cost of animal feed. Its engagement in the market has also reduced.

### **Ada'a Dairy Cooperative**

Ada'a Dairy Cooperative has a processing capacity of 15,000 kgs of milk per day, but it utilizes only about 27 percent of this capacity. The cooperative is operating below capacity due to shortage of milk supply due to some members supplying their milk produce to other processors, unfair competition of other processors and poor awareness of members towards the cooperative. There are also logistical problems associated with collecting milk from 15 collection centers. The cooperative has only four vehicles, although eight are required.

The main dairy products processed by the cooperative are pasteurized milk, yogurt, butter and ayib. The cooperative installed a new processing plant with Birr 6.8 million through the support of donors. It has a small laboratory for testing the safety and quality of milk. It has a feed processing plant which processes and supplies concentrated feed to members and well as to other dairy producers. The cooperative also provides AI and veterinary services to its members. The dairy cooperative has employed a total of 64 permanent workers.

### **Holland Dairy PLC**

Holland Dairy PLC is located in Debre Zeit town of Oromia region, 45 kilometers from Addis Ababa. It installed state-of-the-art Holland technology. The plant has a processing capacity of 8,000 kgs of raw milk per day, but currently utilized only 33 percent of its capacity. The processing plant has also recently started producing pasteurized milk. The dairy plant processes all products in one line, but plans to install different processing lines in the future if financial resources are available.

The processing plant sources raw milk from farmer producers located in and near Ada'a and from individual collectors and dairy cooperatives located in and near Adama. Adulteration of raw milk by some producers and collectors is a problem for the processing plant.

The firm uses packaging material imported from the Netherlands, which accounts for 25 percent of the cost of production. The processed products are packaged in the following form: pasteurized milk in 500 gms plastic bag; yogurt in 250 gms and 500 gms plastic cups; ayib in 500 gms plastic bags; cheese in 1 kg, 3 kg, 5 kg plastic cups; and butter in 200 gms plastic cups and 1 kg plastic bag.

The dairy processing plant sells processed dairy products to customers in Debre Zeit, Addis Ababa, and Adama. It uses its own insulated truck for distributing the products to market areas. The company employs 52 people in the processing plant.

### **Genesis Farm**

Genesis Farm is a privately owned dairy business located in Debre Zeit Town of Oromia Region 45 kilometers from Addis Ababa. Genesis Farm has its own dairy farm with 125 crossbred cows (85 percent exotic blood level). The cows have on average, a productivity of 15 kgs of milk per cow/day (minimum productivity being 10 kgs/cow/day and maximum being 35 kgs/cow/day). The cows are fed with concentrates and hay five times per day. Milk produced by the dairy farm is sold to its own processing plant as well as to outside customers with a price of 6.50 Birr/liter.

Genesis Farm is currently producing pasteurized milk, cheese (Local and Gouda), butter and yogurts. Raw milk products are also sold to other processors, including Lema Dairy PLC. The processing plant is now processing about 3,000 liters of raw milk per day, which is about 60 percent of its full capacity. The plant uses imported packaging materials, and packages pasteurized milk in 500 gms plastic bag; yoghurt in 250 gms and 500 gms plastic cups; cheese local in 500 gms and cheese gouda in 1 kg, 2 kg, 3 kg, and 5 kg plastic bags; and butter in 200 gms and 1 kg plastic bags. The processed dairy products are sold in Debre Zeit, Addis Ababa, and Adama using the company's truck for distribution. A total of 29 workers are employed by Genesis Farm; 14 workers in dairy farm and 15 workers in dairy processing plant.

### **Other Large- and Medium- Processors**

Other than the above mentioned large- and medium-scale dairy processing enterprises, there are few dairy processing enterprises in some urban centres, particularly in Dire Dawa town. Hamdael Dire Dairies Ltd. is a dairy-processor in Dire Dawa. There are other dairy processing facilities scheduled to begin operations in the Mekele and Tigray regions.

#### **3.1.2 SMALL-SCALE DAIRY PROCESSORS**

Small-scale processors are usually limited small niche markets like formajo cheese. The small-scale dairy processors are based mainly in Addis Ababa and Debre Zeit. The small-scale processors source raw milk from their own farm or from dairy cooperatives/unions and individual producers. The small-scale dairy processors who own dairy farms include Beral Milk, Fantu, and Prime Milk. They also collect raw milk from other smallholder producers for processing.

The small-scale processors who are dependent on external milk sources for their processing business include Berta and Bora. The quantity of dairy products produced annually by these small-scale dairy processing businesses is not known.

Small-scale village milk marketing groups and small-scale dairy associations also operate in dairy product collection and marketing in the milk shed area. Such groups and associations have been established in many of the milk shed areas with the

assistance of a number of government and donor agencies. The milk groups create a new marketing outlet for raw milk. These milk groups are the principal outlets for milk from remote areas which otherwise would have been uneconomically utilized by the farm families. The milk groups buy milk from both members and non-members, process it, and sell the derivative products to traders and local consumers. Although the milk groups sometimes sell liquid-milk products such as sour milk, skim milk, or buttermilk, most of their revenue is generated by sales of processed dairy products such as butter and cottage cheese.

### 3.1.3 DAIRY COOPERATIVES

In addition to large-, medium- and small-scale private dairy processing businesses, many dairy cooperatives and unions also are engaged in milk collection, semi-processing, and marketing in Ethiopia. There are approximately 110 primary dairy cooperatives and nine dairy cooperatives unions engaged in dairy businesses (see Table 3B for details).

**TABLE 3B : REGION WISE PRIMARY DAIRY COOPERATIVES AND DAIRY COOPERATIVE UNIONS**

Sr No	Region	No of Primary Dairy Coops	No of Dairy Cooperative Union	Total Dairy Coops/ Unions
1	Oromia	44	4	48
2	Amhara	38	2	40
3	Tigray	17	2	19
4	Addis Ababa	11	1	12
	<b>Total</b>	<b>110</b>	<b>9</b>	<b>119</b>

Source: Land O'Lakes Ethiopia, 2010

A large quantity of milk is produced in the East Showa region. The region has roughly 17 dairy cooperatives engaged in milk collection and marketing business, out of which three cooperatives are focused on camel milk. Most of these dairy cooperatives have small-scale processing equipment, such as cream separators. The cooperatives collect milk from individual members and supply to nearby communities while others supply processing industries like Mama Dairy, Lama Dairy, and Bora Dairy. Among the primary dairy cooperatives, Ada'a dairy cooperative is the most successful cooperative in this region. A new dairy cooperatives union, called "Biftu Gudina Dairy Cooperatives Union" was recently established in Modjo.

The Selale area in the North Showa Zone of Oromia Region is also considered as part of the milk shed area, supplying surplus milk to Addis Ababa. In this area, 33 primary dairy cooperatives are engaged in milk collection, semi-processing and marketing activities. Some of these primary dairy cooperatives established the "Selale Dairy Cooperatives Union" in 2001 to address milk marketing. Currently, Selale Dairy Cooperatives Union has 22 member primary dairy cooperatives, a capital of 1.7 million Birr, and four Isuzu trucks for milk transportation. The union supplies approximately 10,000 – 12,000 kgs of milk per day to Addis Ababa through its own shops to consumers and direct supply to processors like Sebeta Agro Industries, Family Milk, and Berta. The union has also installed one animal processing plant with support of VOCA Ethiopia. The union is currently trying to establish a milk processing plant. A tender for construction was won by an Indian company. Land for the

processing plant was authorized at Sululta. The cost of the plant is to be covered with 30 percent own finance and 70 percent loan from Oromia Cooperative Bank. The major constraints facing the union are: lack of quality standard for milk and milk products; price is fixed by processors and is not based on quality; market problem during the fasting season; and shortage of animal feed.

Debre Brihan area in North Showa Zone of Amhara Region, 125 kilometers from Addis Ababa, is another area considered a milk shed. It is estimated that accessible areas around Debre Brihan area can supply 4,000 – 5,000 kgs of surplus milk per day.

According to North Showa Zone Cooperatives Promotion Office, there are 18 primary dairy cooperatives and dairy cooperatives unions engaged in milk collection, semi processing and marketing businesses. The primary dairy cooperatives recently received quality measuring equipments from Land O'Lakes Ethiopia and small-scale dairy processing equipments from World Vision Ethiopia. The dairy cooperatives have no credit access since banks require collateral to provide the loan which cooperatives do not possess. The cooperatives in the area are also faced with marketing challenges. The price for milk is set by the Lame Dairy Enterprise, the only enterprise collecting milk in the area. Unfair competition by some individual milk collectors have implication on dairy cooperatives as well. Feed shortage and high cost of feed is the major constraint for the milk producers, the cost of feed is currently exceeding price of milk.

### 3.1.4 RECENT DEVELOPMENTS IN DAIRY PROCESSING BUSINESS

The dairy industry in Ethiopia is growing despite its many challenges. A number of large-scale investors have recently entered the dairy business. Timret Agro Industry S. Co. is among the latest companies to commence operations in the dairy, cattle fattening and poultry sectors. The Share Company has plans to establish a dairy farm with 500 cows. Currently, the company has established one dairy farm near Sandafa with 120 cows, creating employment for 24 persons. The company plans to install a processing plant with the capacity for 30,000 - 40,000 kgs of milk per day, capable of producing UHT products. Procuring sufficient land for the facility remains problematic. The managers of the company pointed out that the Development Bank of Ethiopia requires a land certificate including a site plan in order to grant an investment loan for importing the processing plant.

In the Selale area, Elemtu Integrated Milk Agro Industry S.Co recently initiated an investment venture in the Sululta area with an objective of establishing a modern dairy processing plant; collect milk from producers; process milk into different dairy products; and supply the market. In Muka Turi area, a dairy farm called “Selale Dairy Farm” was recently established with a capital of 8 million Birr to produce raw milk and supply to Addis Ababa. Labaka Agro Industry S.Co is another investment venture currently selling shares and has requested land in the periphery of Fitcha.

The East Showa Investment Office indicates that the favorable feed and dairy production environment is inducing investors to engage in the dairy business in the zone. Thirty new investors have been licensed and taken land for dairy farming and

processing businesses recently. However, only five of them have started operation or completed construction work. One dairy farm has currently commenced operation with 100 exotic cows in Bishoftu.

The Pakistani-owned Mariam Dairy Farm operates a dairy farm with about 800 dairy cattle in Adami Tulu – Bulbula area. The farm has considerable potential to supply milk for processing, but the farm has not yet introduced dairy processing capacities, although plans exist to process the milk on the farm.

In the Debre Brihan area, many investors have received business licenses, but only a small number have begun operation. Ruth and Hirut Milk PLC has obtained land, but has not begun operation. Lamrot Milk Development PLC has closed its business due to land provision and capital limitation problems. Baresa Integrated Farm is operating with a few cows and Fekre Mariam Agro Processing has started operation with 10 cows in the periphery of Debre Berihan. In Chacha area, the Bizet Agro Industry has taken land and erected fencing, but has not started operation. The land provision process and availability is the major constrain for investors in Debre Berihan area. The dairy business in the area is currently dominated by dairy cooperatives.

### 3.2 Analysis of Performance the Dairy Industries

This section describes the performance of large- and medium- scale dairy processing industries in terms of capacity utilization, storage, logistics and marketing, labour productivity, technology, product quality, packaging and labeling.

#### Capacity utilization

Most dairy processing plants in the country are operating under capacity. The capacity utilization of large- and medium-scale dairy processing plants described above ranges between 50 percent and 75 percent of their designed capacities. Sebeta Agro Industries PLC (Mama), MB PLC (Family Milk) and Lema Dairy PLC use their capacity the most efficiently. Small-scale and micro-scale dairy processing businesses also operate below their capacities. The main reason for operating below capacity is non sustainability of raw milk supply, which in turn, is affected by seasonal fluctuations and low productivity stemming from poor feed and shortage of feed. In addition, poorly developed transportation systems and irregular and unreliable access to the market for milk and milk products are also reasons for low supply of raw milk.

#### Storage and Cooling Facilities

Manufacturing pasteurized milk requires refrigeration and cold storage. The current practice sees most milk collected un-chilled in the villages and brought to the collection centers of dairy plants, resulting in significant milk spoilage. The establishment of milk collection centers with refrigeration capacity would reduce the amount spoiled and improve the overall quality of milk delivered to processors. Large- and medium-scale dairy processors, particularly Sebeta Agro Industries

(Mama), Lame Dairy, MB PLC (Family Milk), Holland Dairy PLC, and Lema Dairy as well as some dairy cooperatives (Ada'a Dairy Cooperative) have cold storage facilities at milk collection centers where the raw milk is stored until transported to processing plant gates. The large- and medium-scale dairy processing plants have sufficient cold storage facilities for storing chilled milk and frozen dairy products. However, small-scale dairy processors lack such cold storage facilities.

### **Logistics and Marketing**

Inadequate road infrastructure, in particular access roads to rural communities, limits the amount of milk that small-scale producers are willing to bring to collection centres given the amount that is often lost to spoilage during transportation. In addition to limited road infrastructure, the milk collection centres do not have the proper facilities to ensure limited spoilage.

Lack of cooling facilities, inadequate means of transport, and poor communication add to the difficulties of collecting and preserving locally produced milk. The action of pooling, especially pooling of milk collection and transportation activities, have the potential to mitigate costs. Milk production is widespread throughout Ethiopia and improvements in the production, collection, processing and distribution of milk will lead to added income throughout the rural sector. Trucks with refrigeration capacity are used to transport raw milk from collection centers to the processing factory gates.

All of the large- and medium-scale processors are delivering their products using their own delivery trucks with insulated and refrigerated cabins. Lame Dairy Industries distribute processed products in Addis Ababa using trucks, but only two of the trucks are refrigerated. The products go through depots, supermarkets, institutional market (hospitals, hotels, university), and to individuals direct from the vehicles. Sebeta Agro Industries PLC and MB PLC (Family Milk) also own trucks to distribute processed dairy products to sales outlets.

### **Technology**

Performance of the dairy chain is affected by low technology level throughout the chain; limited use of cooling facilities; and use of out-dated small-scale processing equipment, all of which result in waste and sub-standard product quality.

However, most of the large- and medium-scale dairy processing industries have modern dairy processing technologies. Sebeta Agro Industry (Mama), MB PLC (Family Milk), Holland Dairy PLC, Ada'a Dairy Cooperative, and Genesis Farm have modern technologies. Lame Dairy PLC has out-dated machinery, but has plans to gradually replace the machinery.

Sebeta Agro Industry, Lame Dairy PLC, and Family Milk have installed different technology lines for producing various products. Other processors use one line to process different products. Holland Dairy PLC uses single line technology imported from the Netherlands.

## **Labour Productivity**

The contacted large- and medium-scale dairy processing industries indicated that the productivity of labour is very good. Newly recruited workers receive training for operating processing machinery and handling products during processing. However, some milk processing industries also experience managerial limitations.

## **Product Quality**

The hygienic quality of milk products, particularly at the smallholder producer level, is generally poor. Studies indicate that most of the smallholder producers do not properly clean the udder of the cow during the milking operation. In most cases, the proper equipment is not used to bring milk from the farmer to the collection center. Plastic containers are used to transport milk. Unhygienic production and transport conditions create additional challenges for processing industries. Adulteration is another major problem in faced by milk processors and marketers. Milk adulteration is usually done by farmers and brokers.

The monitoring and control of milk and dairy regarding quality remains limited. Deliveries are reviewed with an alcohol test and a lactometer test to check on basic food safety and possible fraud. No bacteriological tests are used; quality control procedures use only physical and chemical tests. All processors use the same equipment to assess the quality of milk (lactometer and alcohol test). The largest processors (Lame, Mama, and Family Milk) each have a small laboratory to do additional microbial and antibiotic test. There are no third party laboratories for testing milk quality. Processors do not differentiate in payment to farmers for quality milk (fat content, hygienic quality, etc), mainly because there is no differentiated market for high quality milk products. Lame Dairy uses preferred suppliers for making cheese during the fasting period for quality reasons. However, these producers do not get a premium for their milk.

Sebeta Agro Industry (MAMA) uses some of the quality standard measures such as HACCP (Hazard Analysis Critical Control Points) in processing and distribution of its products. They also utilize UHT processing facilities. New production lines produce 500 ml carton pouches (Tetra Fino Aseptic) 250 ml portion packages (Tetra Brik Aseptic). Lame Dairy and Family Milk factories also use international quality standards in processing, cold storage and distribution of products.

## **Packaging and Labeling**

Almost all the large-, medium- and small-scale dairy processing companies use imported packaging material to package their dairy products. However, the cost of imported packaging material is very high. Some processors use locally made packaging materials; however, locally produced packaging is not attractive to the consumer when compared to imported products. Processing companies used multiple packing materials. The most commonly used packaging are: 250 gms and 500 gms plastic cups for yogurt; 500 gms and 1liter plastic bags for pasteurized milk; 1 kg, 3 kg, and 5 kg plastic packs for cheese products; and 200 gms and 1 kg plastic

packs for butter. The packaging of dairy products are labeled with the name of processing company or its brand name and contains necessary information such as product name, weight or volume of packaging and address of processor.

### **Pricing of Products**

The price paid to raw milk producers ranges between 4.00 Birr and 6.50 Birr per liter depending on location and buyer. Holland Dairy PLC, Genesis and Ada'a Dairy Cooperative pay a reasonable price at the farm gate and collection centers. However, producers, cooperatives and other stakeholders complain that the price paid to producers is not based on quality. The same price is paid for poor quality milk and high quality milk subject to good handling practices. This has implications on those supplying and buying quality milk to the market.

## **3.3 Overview of Value Chain Actors, Their Roles and Limitations**

There are multiple actors engaged in dairy value chain development. These include public institutions, the private sector, NGOs and associations. Public institution actors are dominant, playing a wide range of roles. Private sector actors are those engaged in input and equipment supply, veterinary, drug and service providers, and dairy product producers, processors and marketers. A brief overview of roles and limitations of the different dairy value chain actors is presented in matrix form in Annex 3 (i).

## **3.4 Comprehensive Analysis of Constraints Hampering Existing and Establishment of Dairy Processing Industries**

Discussions were conducted with the different stakeholders engaged in the sector to in an effort to identify constraints hindering the development of dairy processing plants and the establishment of new dairy processing plants in the country. The overview of these constraints are summarized and presented under large-, medium-, small- and micro-scale operations as follows:

### **Large-Scale Processors**

- Milk supply shortage: supply of milk is seasonal and does not fulfill the requirements of dairy processing plants;
- Dairy processing equipment is not readily availability and high taxation on imported dairy equipments and packaging materials;
- Access to formal finance;
- Infrastructure problems;
- Pricing not based on quality of milk and milk products.

### **Medium-Scale Processors**

- Dairy equipment availability;



- Shortage of capital;
- Financial capacity limitation;
- Shortage of packaging material: Processors get packaging material mostly by importing from foreign countries which are expensive and are subject to high taxes. Local products lack quality;
- Pricing strategy of processors do not encourage primary producers to increase milk production;
- Long process of land acquisition.

### **Small- and Micro-Scale Processors**

- Lack of collateral require to obtain credit from most financial institutions;
- Cost of entry to the sector is high;
- Low level of adoption of dairy processing technology;
- Shortage of raw milk;
- Shortage of feed supply;
- Unable to compete with imported products;
- Poor procurement system;
- Unable to fulfill quality standards;
- Lack of demand for dairy products during fasting days.

### **Primary Milk Producers / Dairy Farms**

- High cost of feed: the a main factor for the high production cost of milk – the highest in the ESA Region – is the inconsistent supply of roughage, often of poor quality;
- Lack of scientific management of dairy production technology (i.e.: veterinary service, feeding and hygienic product handling);
- High margin appropriation by processors and intermediate traders, primary producers' share is low;
- Shortage of improved/hybrid heifers and bull service and AI;
- Shortage of liquid nitrogen nearer to dairy producing areas and logistic problem to bring liquid nitrogen from remote locations;
- Lengthy land acquisition procedures.

## **3.5 Regulatory Issues and Gaps Affecting Dairy Sector**

- No national dairy policy and regulation in place;
- No standard for dairy equipment;
- Quality standard and control system is not in place;
- There is no mutually beneficial relationship between processors and dairy cooperatives.

### 3.6 Opportunities for Improving Overall Performance of the Dairy Sector

- Conducive business environment;
- Potential livestock and dairy resource base and favorable climate;
- Favorable investment policy;
- High demand for dairy and dairy products;
- Export market opportunity to neighboring countries (Somalia, Djibouti, Sudan);
- Presence of large dairy processing plants;
- Increased growth and effectiveness of dairy cooperatives unions;
- Many development agencies work on dairy;
- Federal and Regional Government commitment on livestock and dairy extension;
- Many investors are establishing dairy processing industries/ plants;
- Presence of incentive packages for investors, particularly for those interested to invest in agro-processing industries.

### 3.7 Government Support Needed to Strengthen the Sector

- Land facilitation for dairy farms, processors, and animal feed processors;
- Increase loan availability for dairy operators;
- Setting and enforcing quality standards for milk, milk products and feeds;
- Collaborative work with NGOs and partners on capacity building and dairy cooperative strengthening;
- Technical support in dairy technology and development of dairy-related knowledge;
- Support the establishment of Ethiopian Dairy Board which will be accountable for dairy development activities;
- Arrange long-term credit from the Development Bank to expand existing processing plants and to install new processing plants.

## CHAPTER 4: COMPARISON AND BENCHMARKING WITH THE BEST PRACTICE COUNTRIES

### 4.1 Adaptability and Scalability of Best Practices to Improve the Quality and Safety Standards for Milk and Milk Products

Linking production systems with markets through increasingly complex producer-to-consumer supply chains is a challenge. Fast growing requirements for technical and management know-how to ensure compliance with high level standards throughout the dairy supply chain gives rise to the question of market access and competitiveness, in particular for small- and medium scale farmers and processors in developing countries. Since earnings from agro-industrial exports including dairy products considerably contribute to the economic and social development in many developing countries, there is an urgent need to support public and private stakeholders to gain and increase international competitiveness.

Global trading needs standardized products. Hence, legal and trade requirements for quality assurance systems and milk quality control along the entire dairy chain, from milk production, through milk processing and the distribution system, up to the final consumers' table are increasing considerably. Competing with imports in the domestic market and with global players in regional and international markets requires marketable products that are safe for human consumption and meet further market requirements (quality, nutritional value, taste, appearance and presentation, continuous and reliable supplies). Producers and processors in developing countries like Ethiopia and transition economies hence need appropriate legal and institutional frameworks, competent control, auditing and consulting services as well as appropriate production, processing, handling, trading and marketing technologies and know-how.

There is huge scope for Ethiopia to upgrade the dairy quality and safety standards of the country and move toward a more robust and integrated approach towards the same. Given the importance that dairy quality and safety has obtained in the global context, it is essential for Ethiopia to provide the legal and structural framework and platform to facilitate the development implementation of dairy quality and safety systems in the country.

This would require active public interventions encompassing regulatory and legislative restructuring, capacity building, certification programs and campaigns & incentives to promote adoption and support implementation. A coherent policy is the most critical factor to establish an environment for supplying safer and quality agricultural products and food. The adaptability and scalability of best practices to improve the quality and safety standards for milk and milk products has been

tabulated in Table 4A below. Please refer to the Annexure 4 (i) for case studies from best practice countries.

## **4.2 Adaptability and Scalability of Best Practices to Improve the Policy and Institutional Support for the Sector**

The primary drivers in dairy sector development include changes in demand, advances in production, transportation and communication technology, enhanced on-farm productivity due to improved management, and the expanding scope of dairy product marketing. However, a creative mix of sector policies, programmes and institutional support that provide an enabling environment for sector development and private sector engagement can favorably influence the rate and shape of growth. Moreover, these interventions should ensure engagement of the private sector through innovative partnerships, cost-sharing arrangements and meaningful participation of smallholders.

Successfully achieving ambitious policy objectives, as in the case of developed countries, can be hugely expensive – depending on how measures and programmes are implemented. In developing countries, given financial constraints, dairy policies that involve direct support to industries are not prevalent. The adaptability and scalability of best practices to improve the policy and institutional support for the sector is given in Table 4B below. Please refer to the Annexure 4 (i) for case studies from best practice countries.

## **4.3 Adaptability and Scalability of Best Practices to Improve the Financial Access at Various Stages of Dairy Value Chain**

Lack of sufficient landholding for cultivation of green fodder, limited resources leading to absence of collaterals to offer, inability to generate own contribution, lack of technical skills to make the enterprises more viable and lack of financial resources to purchase the inputs are some of the constraints in financing small dairy farmers. The banks and other financial institutions need to play the proactive role in providing easy and user friendly credit to the end users of each component viz production, procurement, processing and distribution across the milk value chain through development of area specific schemes and redesigning of their financial products. This will also enhance the agri advances portfolio and the customer base of the commercial banks. The adaptability and scalability of best practices to improve the financial access at various stages of value chain is given in Table 4C below. Please refer to the Annexure 4 (i) for case studies from best practice countries.

#### **4.4 Adaptability and Scalability of Best Practices to Improve the Infrastructure and Its Efficiency**

The adaptability and scalability of best practices to improve the infrastructure and its efficiency is given in Table 4D below. Please refer to the Annexure 4 (i) for case studies from best practice countries.

**TABLE 4A: ADAPTABILITY AND SCALABILITY OF BEST PRACTICES TO IMPROVE THE QUALITY AND SAFETY STANDARDS FOR MILK AND MILK PRODUCTS IN ETHIOPIA**

S. NO	PARAMETER	EXISTING SITUATION	BEST PRACTICES IDENTIFIED	APPLICABILITY TO ETHIOPIA	IMPACT AREA IN VALUE CHAIN
1	Single Comprehensive Milk Safety policy	No comprehensive food safety policy in place	<ul style="list-style-type: none"> <li>The Food Safety and Standards Bill Act, 2005 in India (FSSAI).</li> </ul>	<ul style="list-style-type: none"> <li>To have the single regulatory mechanism that will put in place milk and milk products standards and regulate manufacturing, import, processing, distribution and sale of milk and milk products.</li> </ul>	<ul style="list-style-type: none"> <li>Focused approach towards milk and milk products safety and quality thereby achieving better safety and quality control;</li> <li>Proper coordination among various stakeholders for collective enforcement of regulations.</li> </ul>
2	Contaminant Surveillance and Risk Assessment System	Food safety system of Ethiopia lacks a structured food borne disease and contaminant surveillance and risk assessment system. Hence there is lack of data capture on food contaminants and food borne diseases resulting is lack of a base reference for developing the requisite food safety systems. There is thus an urgent need to put in place a well structured surveillance system.	<ul style="list-style-type: none"> <li>Food Safety Standards Framework of Australia comprising of pre farm regulation, farm regulation, manufacture regulation and distribution regulation in documented manner;</li> <li>European Union Import and Export Regulations for Milk and Milk Products.</li> </ul>	<ul style="list-style-type: none"> <li>To have the documented standards at each micro level value chain component;</li> <li>Responsibility Sharing among stakeholders;</li> <li>Traceability comfort;</li> <li>Risk Mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>Better quality products for domestic markets;</li> <li>Improve the export competitiveness in nearby potential export markets.</li> </ul>
3	Standards Enforcement & Implementation Agency	Quality and Standards Authority of Ethiopia (QSAE) is the agency coordinating with other departments	<ul style="list-style-type: none"> <li>Kenya Dairy Board;</li> <li>Kenya Bureau of Standards.</li> </ul>	<ul style="list-style-type: none"> <li>To have focused inspection of large processed units;</li> <li>To avoid confusion in implementation of standards across chain.</li> </ul>	<ul style="list-style-type: none"> <li>Focused control and inspection of milk production till consumption standards.</li> </ul>

**TABLE 4B : ADAPTABILITY AND SCALABILITY OF BEST PRACTICES TO IMPROVE THE POLICY AND INSTITUTIONAL SUPPORT FOR THE DAIRY SECTOR IN ETHIOPIA**

S. NO	PARAMETER	EXISTING SITUATION	BEST PRACTICES IDENTIFIED	APPLICABILITY TO ETHIOPIA	IMPACT AREA IN VALUE CHAIN
1	Milk Production Enhancement and Processing Policies	No of policies, schemes and programmes to improve the milk production like livestock development policy, livestock master plan, animal health and feeds and nutrition, dairy development are in place with some in drafting stage.	<ul style="list-style-type: none"> <li>▪ India Policies on Breeding, Livestock Importation, Feeding, Disease Monitoring, Fodder Development to improve the milk production, assistance to cooperatives and private milk processing plants.</li> </ul>	<ul style="list-style-type: none"> <li>▪ To have the comprehensive policies covering each input that goes into milk production enhancement with physical and financial allocation of funds;</li> <li>▪ To have the clear cut fiscal incentives for milk processing industries.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improved Milk Production;</li> <li>▪ Increased Private Sector Participation for production of value added dairy products for exports purpose.</li> </ul>
2	Milk Trade Policies with Special Reference to Exports	Milk Product Trades are insignificant	<ul style="list-style-type: none"> <li>▪ USA Dairy Exports Policy</li> </ul>	<ul style="list-style-type: none"> <li>▪ To have the FTA with the neighboring countries. However, this would require the production of high quality dairy products meant for export market.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Export Competitiveness.</li> </ul>
3	Institutional Agencies Across the Value Chain	Few agencies like Farmers Training Centers and Ethiopian Milk Producers and Processors Associations are not sufficient enough to provide technical extension advisory services for milk production improvement	<ul style="list-style-type: none"> <li>▪ European Dairy Association;</li> <li>▪ European Milk Board;</li> <li>▪ Kenya Dairy Board;</li> <li>▪ National Dairy Development Board (NDDB) in India;</li> <li>▪ Direct involvement of agencies like Amul consolidating production, collection, processing;</li> <li>▪ National Milk Grid.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Increased participation of all the stakeholders of the value chain to represent their issues and design effective strategies in consultation with the Government and private sector;</li> <li>▪ Effective collection mechanism addressing supply constraints;</li> <li>▪ Distribution of resources.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Holistic development of the sector through participatory approach of all the stakeholders;</li> <li>▪ Public –Private Partnership (PPP) model to pave the way for increased investment opportunities.</li> </ul>

**TABLE 4C: ADAPTABILITY AND SCALABILITY OF BEST PRACTICES TO IMPROVE THE FINANCIAL ACCESS  
AT VARIOUS STAGES OF VALUE CHAIN IN ETHIOPIA**

S. NO	PARAMETER	EXISTING SITUATION	BEST PRACTICES IDENTIFIED	APPLICABILITY TO ETHIOPIA	IMPACT AREA IN VALUE CHAIN
1	Access to Finance	Low access to credit. Only the Development Bank of Ethiopia is actively engaged in providing credit to Agriculture.	<ul style="list-style-type: none"> <li>India (Contract Farming involving NGOs, cooperatives and private dairies) with emphasis on model such as the Basix model.</li> </ul>	<ul style="list-style-type: none"> <li>To increase flow of credit to select value chain;</li> <li>Increase Financial Literacy;</li> <li>Assured buy-back from the farmer;</li> <li>Extension services provided by the cooperatives/private players to improve the milk yield;</li> <li>Cooperatives/Private players provide guarantee for timely repayment of loans;</li> <li>Farmers' trust remains intact;</li> <li>Sustainable business model for small scale and producer farmers.</li> </ul>	<ul style="list-style-type: none"> <li>Credit flow to targeted value chains;</li> <li>Boosting investor confidence;</li> <li>Infrastructure and service development in sector;</li> <li>Better operating cycle at farm level with greater financial inclusion.</li> </ul>
2	Collateralized Loans	Availability of good quality collateral is an issue	<ul style="list-style-type: none"> <li>India;</li> <li>Brazil.</li> </ul>	<ul style="list-style-type: none"> <li>Hedging risk with financial institutions with tripartite agreements.</li> </ul>	<ul style="list-style-type: none"> <li>Producers;</li> <li>Cooperatives;</li> <li>Business Entities.</li> </ul>
A	Land as collateral	All land is state owned. Private entrepreneurs are provided land on lease and are not allowed to use land as collateral for securing bank loans	<ul style="list-style-type: none"> <li>Most Developing and Developed countries (India etc).</li> </ul>	<ul style="list-style-type: none"> <li>Will reduce bank credit risk and increase flow of credit for industrial/manufacturing purposes;</li> <li>Can lead to higher infusion of FDI in the sector.</li> </ul>	<ul style="list-style-type: none"> <li>Processors/Manufacturers;</li> <li>Infrastructure Developers/ Foreign Investors;</li> <li>Service Providers.</li> </ul>



**TABLE 4D : ADAPTABILITY AND SCALABILITY OF BEST PRACTICES TO IMPROVE THE INFRASTRUCTURE AND ITS EFFICIENCY**

S. NO	PARAMETER	EXISTING SITUATION	BEST PRACTICES IDENTIFIED	APPLICABILITY TO ETHIOPIA	IMPACT AREA IN VALUE CHAIN
1	Cold Chain Infrastructure from milk production till milk processing	<ul style="list-style-type: none"> <li>Adequate cold store capacity not present;</li> <li>Public investment in Cold Store infrastructure not substantial.</li> </ul>	<ul style="list-style-type: none"> <li>Cold Chain initiative – India;</li> <li>Incentive scheme for Strengthening Infrastructure for Clean Milk Production and Dairy Venture Capital Fund in India;</li> <li>Agro Food Park.</li> </ul>	<ul style="list-style-type: none"> <li>Improvement in storage infrastructure;</li> <li>Direct investment from private players;</li> <li>Better and efficient infrastructure for setting up dairy operation.</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in wastage during handling and transport;</li> <li>Better storage infrastructure;</li> <li>Availability of Integrated infrastructure and services for institutional and foreign investors.</li> </ul>
2	Use of Information Communication Technology (ICT) modes in milk procurement	<ul style="list-style-type: none"> <li>Use of ICT across the value chain is absent.</li> </ul>	<ul style="list-style-type: none"> <li>Dairy Portal and Dairy Information Services Kiosk in cooperatives in India.</li> </ul>	<ul style="list-style-type: none"> <li>Extension services to the farmers;</li> <li>Immediate payment to the farmers based on the quality and quantity of milk;</li> <li>Satisfactory milk procurement models;</li> <li>Supports e-banking modules.</li> </ul>	<ul style="list-style-type: none"> <li>Fair and Transparent payment to milk producers;</li> <li>Improvement in milk yield and quality.</li> </ul>
3	Artificial Insemination (AI) Services	<ul style="list-style-type: none"> <li>No privatization of AI services.</li> </ul>	<ul style="list-style-type: none"> <li>Private sector participation in AI services.</li> </ul>	<ul style="list-style-type: none"> <li>Better distribution of semen, training of inseminators and supply of equipments to inseminators and community based organizations.</li> </ul>	<ul style="list-style-type: none"> <li>Improved cattle breeding would lead to improved milk yield.</li> </ul>
4	Value added milk products	<ul style="list-style-type: none"> <li>Less diverse value added milk products.</li> </ul>	<ul style="list-style-type: none"> <li>Improving the quality of raw milk and counteract the competition from the imports, potential is there to introduce value added milk products in Kenya.</li> </ul>	<ul style="list-style-type: none"> <li>Augmenting Milk Collection Centers to improve the quality of raw milk.</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced processing capacity utilization.</li> </ul>



# CHAPTER 5: SWOT AND PEST ANALYSIS OF THE DAIRY SECTOR IN ETHIOPIA

## 5.1 SWOT Analysis of Dairy Sector in Ethiopia

Based on the availability of both quantitative and qualitative information from the value chain analysis, the dairy sector was analyzed with regards to Strengths, Weaknesses, Opportunities and Threats (SWOT). The SWOT covers Production, Processing and Marketing, including exports. The details of the same are presented in the Table 5A below:

**TABLE 5A: SWOT ANALYSIS OF DAIRY SECTOR IN ETHIOPIA**

STRENGTHS	WEAKNESSES
<b>1 Production</b>	
<ul style="list-style-type: none"> <li>✓ Diverse topographic and favorable climatic conditions for dairy development;</li> <li>✓ Availability of low cost labour;</li> <li>✓ Attractive investment environment;</li> <li>✓ Large cattle population (close to 16 percent of total African cattle population);</li> <li>✓ 40 percent of the country area, constituted by the highlands, are conducive for dairy development on account of high population density, good main road infrastructure, power and communication connectivity and urban population concentration.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Lack of adequate land for feed production and pasture development, especially on productive highland areas;</li> <li>✓ Uneven weather conditions: long periods of little rain broken by periods of heavy rainfall;</li> <li>✓ Lack of skilled extension staff and technical services for animal breeding, feeding, veterinary care and hygiene;</li> <li>✓ High growth rate of population (about 3 percent per annum) has resulted in diversification of land meant for feed production and livestock activities to cultivation of other crops;</li> <li>✓ Poor animal health and management on account of poor feeding systems;</li> <li>✓ Low milk productivity of indigenous cattle (0.5 -2 kgs per day).</li> </ul>
<b>2 Processing</b>	
<ul style="list-style-type: none"> <li>✓ Low cost of unskilled labor;</li> <li>✓ Growing demand for milk in urban centres.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Poorly developed infrastructure in the majority of the country such as access/feeder roads to supply marketable milk to collection centers;</li> <li>✓ Most of the dairy plants are operating under processing capacity (less than 40 percent);</li> <li>✓ Demand of milk and milk products highly influenced by the seasonal demand (fasting of more than 200 days or more) leading to the less production of milk and milk products;</li> <li>✓ Low per capita consumption of milk (16 litres per year).</li> </ul>
<b>3 Marketing</b>	
<ul style="list-style-type: none"> <li>✓ Large local consumer base with varied segmentation like school milk programmes and health campaigns.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Lack of cold chain infrastructure at potential milk producing and supply areas;</li> <li>✓ Reluctance among consumers to purchased processed milk products;</li> <li>✓ No incentives for high quality milk as there is no control over quality of milk marketed. Farmers get the same price regardless of the quality of milk, which leads to adulteration;</li> <li>✓ 90 percent of the milk is marketed through informal channels;</li> <li>✓ Lack of harmonized tariff on intra-regional trade in dairy products.</li> </ul>

OPPORTUNITIES	THREATS
<b>1 Production</b>	
<ul style="list-style-type: none"> <li>✓ Growth of urban population, increased income and youth demographic will drive demand for milk products (Urban market for liquid milk is projected at 60 million litres by 2015 in Ethiopia);</li> <li>✓ Investment opportunities in equipment supply and leasing, farm input supplies via organized check-off systems for groups of large-scale farmers, milk testing and recording services, transport services and private extension services;</li> <li>✓ Provision of advisory services including breeding technologies, dairy feed processing and feed technologies;</li> <li>✓ Lowest cost of milk production in the world.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Potential for natural disasters severe climatic occurrences such as drought and flooding;</li> <li>✓ Resistance to adopt improved breeds for higher milk production;</li> <li>✓ Feed shortages and nutrient deficiencies become more acute in the dry season in both the highlands and lowlands. Studies have indicated that there is a deficit of about 12.3 million tonnes of dry matter in Ethiopia.</li> </ul>
<b>2 Processing</b>	
<ul style="list-style-type: none"> <li>✓ Presence of Ethiopian Investment Code for promoting private sector participation in dairy sector development to domestic and foreign investors through fiscal incentives;</li> <li>✓ Processing surplus milk into powdered milk would reduce post-harvest losses and add value to a product for both the domestic and regional market;</li> <li>✓ Production of flavored milk has shown growth mainly due to the demand from the younger generation and urban population;</li> <li>✓ Scope of increased production of UHT milk and milk powders to cater to the needs in lean season and scarcity;</li> <li>✓ Scope of increased production of currently imported products such as ice cream, cream, wide varieties of cheese, yoghurt and cultured products.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Processing is hindered by fasting traditions adhered to by half of the Ethiopian population;</li> <li>✓ Significant increase in raw material costs such as feed, veterinary care, transport may lead to increase in cost of production of milk;</li> <li>✓ Inability to pass on the higher costs to the low purchasing power of the consumers;</li> <li>✓ Difficulties in starting a business (eg: strict regulations, barriers to accessing credit, and minimum capital requirements) and enforcing contracts in Ethiopia.</li> </ul>
<b>3 Marketing</b>	
<ul style="list-style-type: none"> <li>✓ Potential of dairy products exports due to the abundant and capable labour force, low wage levels, a wide-ranging weather and soil conditions, preferential access to the major world markets including Europe, USA and the COMESA;</li> <li>✓ Investment in milk tankers and transportation facilities will offer profitable business opportunities;</li> <li>✓ Investment opportunities exist in establishing better managed milk collection centre as well as reliable milk distribution facilities including transport facilities and cold chains;</li> <li>✓ Ethiopia supermarkets are a rapidly emerging phenomena. Supermarket outlets are growing in other major urban areas of the country and could be considered as a new market region for dairy products.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Competition for milk from formal and informal market systems;</li> <li>✓ Non-competitiveness in international markets.</li> </ul>

## 5.2 PEST Analysis of Dairy Sector in Ethiopia

The Political, Economical, Social & Technological Assessment of dairy sector in Ethiopia is highlighted below:

### 5.2.1 ASSESSMENT OF POLITICAL SITUATION IN ETHIOPIA AFFECTING THE DAIRY SECTOR

- The Ethiopian's People's Revolutionary Democratic Front (EPRDF) have brought several reforms in macroeconomic policies; changes in cooperative legislation; and have opened the manufacturing sector to private investment which resulted in growth in the dairy sector;
- The recent national and sectoral policies related to livestock include Agriculture Development Led Industrialization (ADLI); Poverty Reduction Strategy Paper (PRSP); Food Security Strategy (FSS); Rural Development Policy and Strategies (RDPS); Capacity Building Strategy and Program (CBSP); Agricultural Marketing Strategies (AMS); and the Foreign Affairs and Security Policy and Strategy aimed at poverty reduction and growth of the dairy sector.

### 5.2.2 ASSESSMENT OF ECONOMIC SITUATION IN ETHIOPIA AFFECTING THE DAIRY SECTOR

- The Ethiopian economy is primarily agricultural-based with more than 80 percent of the country's population employed in this sector. While the contribution of the livestock industry to the country's total exports is currently low compared to its potential, this sector holds great promise as a source of export diversification in the future;
- In the late 1980s, agriculture in Ethiopia contributed about 45 percent of national GDP while the livestock sector contributed about 40 percent of agricultural GDP (18 percent national GDP) and 30 percent of agricultural employment. Dairy output accounted for about half of livestock output (Getachew and Gashaw 2001). More recent figures indicate that the livestock sector contributes about 12 percent of national GDP, 26 percent of agricultural GDP (CSA 2009);
- The sector has remained underdeveloped and its potential has not been efficiently and effectively used. In the crop–livestock system of the highland agro-ecology, the sector is an essential component of the overall farming system, being a major source of traction power, food, cash income, fuel and organic fertilizer. In the pastoral and agro-pastoral areas, livelihoods of the people entirely depend on livestock;
- Ethiopia's agriculture is plagued by periodic drought, soil degradation caused by overgrazing, deforestation, high population density, high levels of taxation and poor infrastructure (making it difficult and expensive to get goods to market). Yet agriculture is the country's most promising resource. The potential exists for self-sufficiency in grains and for export of livestock, grains, vegetables, and fruits. As many as 4.6 million people need food assistance annually;

- The Middle East countries are Ethiopia's traditional destinations for meat and livestock exports and the exports to these countries have increased. Given their high income and the consumer preferences for Ethiopian products and the proximity to these countries, there is opportunity to boost exports further. A major shift from live animal export to value added animal products including dairy products compliant with sanitary and phytosanitary standards and food safety should be considered in order to increase income and minimize the risk of export bans due to diseases;
- The habit of consuming milk and milk products is yet to be developed, even among middle income urban households with greater purchasing power. The small quantity of milk produced coupled with high transaction costs results in lower prices for smallholder producers and high product price for urban consumers leading to low demand;
- Ethiopia ranks 116 out of 181 countries in The Ease of Doing Business Ranking and ranks 124 out of 155 countries in the Index of Economic Freedom which analyzes a wide range of issues including trade barriers, corruption, government expenditures, property rights, and tax rates;
- The Growth and Transformation Plan (GTP) 2010-11 to 2014-15 prepared by Ministry of Finance and Economic Development (MoFED), states that livestock resources development will be practiced as part of a scaling-up strategy. The focus will be on the expansion of livestock fattening and dairy resources development technology. In addition to this, honey production technology and poultry resources development technologies will be put in place. Technological advance will be complemented by a focus on breed improvement, pasture development and animal health. In the case of breed improvement, cattle breeding will be done extensively by focusing on artificial insemination (AI) breeding techniques and the extensive implementation of better selection of local breeds and distribution. Since both improved and existing breeds can become productive when they get adequate and balanced feed, homestead pasture development, improvement of grazing land, use of forest hacks, and developing pasture crops for zero grazing practices are tasks that will be given attention. In the area of animal health services, the focus will be on prevention; the following will be implemented: providing extensive vaccination services before the prevalence of disease, building additional capacity for vaccine storage, training of adequate animal health specialists and expanding the institutions, including mobile service provision.

### 5.2.3 ASSESSMENT OF SOCIAL SITUATION IN ETHIOPIA AFFECTING THE DAIRY SECTOR

- Orthodox Christians comprising about 40 percent of the Ethiopian population abstain from consuming dairy and other animal products for about 200 days in a year. Thus, low demand for dairy products in Ethiopia compared to demand in other low income countries in Sub-Saharan Africa appears to be a major reason for the slow growth of the dairy sector;

- The total population of Ethiopia is 82 million. Of this, the rural and urban populations constitute 84 percent and 16 percent respectively with the higher concentration of population in the highlands. With the increasing population of the highlands in recent years, more land has been diverted to crop cultivation, leading to increasing smaller grazing areas for cattle. These factors had negative impacts on milk production and milk productivity;
- Ethiopians consume most of the milk with tea or coffee as well as for feeding infants or elderly. The dairy products which are widely consumed include butter, ayib and fermented milk. Approximately 55 percent of the produced milk is consumed at home and only 15 percent is sold in the market. Expenditure on dairy products constitutes only 0.3 percent of total household expenditures. Imports of butter, cheese, dried, whole-milk powder, and sweetened condensed-milk are sold largely in urban centers. Whole-milk powder is used as a substitute for fresh milk for some consumer groups, such as for children or when supply of fresh milk is inadequate;
- In rural areas, the consumption of milk and milk products is greatly affected by livestock ownership as compared to the urban areas where in the consumption patterns are based on levels of income. It has been estimated that the urban market for liquid milk is projected to reach to 60 million kg owing to the rapidly growing population, urbanization, change in lifestyle and consumption behaviour;
- Though 90 percent of the milk is marketed informally, the development of village, milk-marketing groups and small-scale associations and cooperatives has been instrumental in laying the foundation of dairy development in Ethiopia.

#### 5.2.4 ASSESSMENT OF TECHNOLOGICAL SITUATION IN ETHIOPIA AFFECTING THE DAIRY SECTOR

- Inadequate supply of quality feed is one of the major factors impeding milk production. Fodder and grass are available in limited quantities on account of inconsistent weather and depleting land resources. National and international research agencies, including the International Livestock Research Institute (ILRI), have developed several feed production and utilization technologies as well as strategies to address the problems of inadequate and poor quality of feeds. However, adoption of these technologies in the Ethiopian highlands has been limited;
- Genetic improvement has been recognized in the design and implementation of the development projects in the country during the last four decades. Production and distribution of crossbreed heifers, provision and distribution of dairy stocks, provision and strengthening of AI services, and/or bull service were major components of the development projects implemented between 1967 and 1998. Sebeta Agro Industry established the first UHT dairy processing facility in Ethiopia. The facility produces 500 ml carton pouches (Tetra Fino Aseptic) and 250 ml portion packages (Tetra Brik Aseptic) to cater to the needs of the population in periods of scarcity;

- The Ethiopian Agricultural Research Organization (EARO) is responsible for promoting and streamlining research in agriculture (crop, livestock, fisheries, and forestry) giving more attention to crop-production improvement. Dairy development research was re-oriented to work in genetics, husbandry, feed-resource management, animal nutrition, physiology, animal health, dairy-processing technology, social economics and technology transfer. The Holeta Research Station serves as a center of excellence for dairy research. The center coordinates all dairy-improvement research in different regional states and other stations, including collaboration with agricultural universities and colleges;
- The newly established Ethiopian Meat and Dairy Technology Institute (EMDTI) have a mandate to modernize dairy farming and improve the stock and quality of cattle in Ethiopia. The body will also help pastoralists protect their livestock against the negative effects of climate change by providing feeds and water and veterinary medicine in each district. The EMDTI will also focus on providing training and consultancy services.



## CHAPTER 6: DAIRY SECTOR DEVELOPMENT STRATEGY

The proposed strategy for the development of the dairy sector is organized in detailed action plans targeting identified constraints and opportunities in four different segments of the dairy value chain:

Milk Production (action plan 6.1.1 – 6.1.9)

Milk Procurement (action Plan 6.2.1 – 6.2.4)

Milk Processing (action Plan 6.3.1 – 6.3.5)

Marketing – Domestic and Exports (action plan 6.4.1 – 6.4.2)

The action plans and detailed action plans outline the most important interventions necessary to support the transformation of the Ethiopian dairy sector to a modern and competitive sector that delivers safe dairy products of high quality to the Ethiopian people.

### 6.1.1 IMPROVING MILK PRODUCTION THROUGH IMPROVING FODDER PRODUCTION

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Improve bovine productivity.	Enhance fodder production and implement the optimal feeding programmes.	
SITUATIONAL ANALYSIS		
<p>Natural pasture from communal grazing lands and crop residues have been the main sources of feed for dairy cattle, particularly in peri-urban and rural areas including pastoral/agro pastoral systems. Grazing as a source of livestock feed has begun to decline in recent years, as a result of increased areas of cultivation, and changing patterns of leaving land fallow for regeneration. Dairy producers in the urban areas mainly use purchased roughage and concentrate feeds. In cultivable lands, green fodder production is marginal, subsidiary and non-commercial unlike food, horticultural and other field crops. They are still considered low priority crops. Deterioration in the feed resource-base as well as unplanned feeding regimes have resulted in a very high seasonal variability in milk yield, biodiversity loss (indigenous breeds, tree and grass species), and expansion of fodder market with rising fodder prices. The increasing fodder scarcity is stimulating producers' interest in on-farm fodder production and efficient crop residue utilization. Prices of industrial by-products from sugar factory, oil mill, brewery and grain mill are increasing beyond control of milk producers.</p>		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Reduction in cost of milk production and increase in daily net income per animal;</li> <li>✓ Increase in annual production and distribution of quality fodder seeds (in metric tonnes).</li> </ul>	<ul style="list-style-type: none"> <li>✓ Longer time might be required to convince stakeholders on all levels of the government and in rural communities that fodder production is of great importance not only to livestock farming but also to overall food security since feed crops are still considered low priority crops compared to food crops;</li> <li>✓ Lower adoption of fodder preservation methods as the cultivation is scanty and small and scattered land holdings with few herd stock prevent the farmers to undertake such adoptions.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Build case of benefit to overall industry.</li> </ul>
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Develop large-scale (industrial) fodder production schemes for different types of land including setting up of large-scale production, multiplication and distribution of improved seeds for different types of feed crops in irrigable lands in the lowlands as well as marginal lands in the highlands;</li> <li>2. Develop community pasture fodder production systems for poor rural communities at lowlands;</li> <li>3. Develop and promote Ration Balancing Programme (RBP) based on locally available fodder/feed crops.</li> </ol>		
<b>TOTAL BUDGET</b>		<b>2,820,000</b>

**DETAILED ACTION PLAN 6.1.1: IMPROVING MILK PRODUCTION THROUGH IMPROVING FODDER PRODUCTION**

A.NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (\$)
1.1	Prepare/update comprehensive inventory on fodder production in the country to ascertain the requirements and supply to plan and formulate fodder production schemes.	MoA, RBoA	■■■■	■■■■				120,000
1.2	Collect data from milk producers regarding their (seasonal) requirements for fodder seeds for a five year span for dairy production.	RBoA, unions, coops	■■■■					100,000
1.3	Promote large-scale reseeding of pasture lands with legumes and non-legumes by small-scale farmers as commercial production.	RBoA	■■■■					50,000
1.4	Introduce fodder trees and shrubs in grasslands and wastelands, use of orchard interspaces for forage leaf meal production. Mandate forest dept, & MoA and local bodies for development and implementation of these schemes.	MoA, RBoA	■■■■	■■■■	■■■■	■■■■		200,000
1.5	On the basis of above data, mandate breeder seed distribution to the Ethiopian Animal Feed Industries Association (EAFIA) to arrange procurement of breeder and foundation seed three years in advance.	EAFIA		■■■■				
1.6	Supply breeder seeds of improved varieties from MoA to dairy farms, breeding farms, processing units.	MoA, ILRI, EAFIA	■■■■	■■■■				400,000
1.7	Mandate seed laboratories under the ambit of regional bureaus of agriculture to monitor and approve the quality of foundation and certified seeds at the request of production agencies.		■■■■					300,000
1.8	Organize further multiplication of seeds through registered growers under a buy-back arrangement.	MoA, ESA		■■■■				50,000
1.9	Provide technical guidance to seed growers to produce quality seed, own and manage seed storage to rural development agencies, collection and transportation of fodder.	MoA, RBoA		■■■■	■■■■			50,000
1.10	Establish and Manage Fodder Banks-cum-Complete Feed Production Units (Fodder Banks are created to utilize the fodder under drought/distress conditions. With fodder bank, the production of complete feed can also be undertaken in agro-pastoral areas. Depending on the availability of crop residues, the surplus fodder can be converted into complete feed, while avoiding the wastage and recovering the cost of operation). Entrust the responsibility of establishment of fodder banks to local community or dairy farmers' organizations or NGOs. Entrust the MoA to finance the shortfall for operating the fodder banks depending upon commercial viability.	RBoA	■■■■	■■■■	■■■■	■■■■	■■■■	1,500,000
1.11	Mandate EAFIA and RBoA to market surplus certified/truthfully labeled seeds.	EAFIA, RBoA		■■■■				--
1.12	Assign primary cooperatives and unions in the marketing of fodder seeds with active support from EDDA and EAFIA.	EMDTI, EAFIA	■■■■	■■■■				50,000
	<b>TOTAL BUDGET</b>							<b>2,820,000</b>

A.NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (\$)
2.1	Prepare the broad framework/norms for allocation and utilization of resources for community pasture fodder production including community contributions and inputs (e.g labour), use of outputs, distribution of income, stocking rate, breed improvement to be mutually agreed between the local communities.	RBoA	■■■■	■■■■	■■■■			100,000
2.2	With active participation of Regional Bureaus of Agriculture, local NGOs/Civil Society Organizations, identify niche areas that can be used for forage production.	RBoA	■■■■					20,000
2.3	Develop the policy framework for delineating the common land and long-term management rights to user groups/associations.	MoA, RBoA, Regional administration	■■■■					50,000
2.5	Develop controlled grazing, browsing and cut and carry feeding regime and regeneration schemes and empower the local communities to enforce the schemes.	Mol, EMDDI	■■■■	■■■■				50,000
2.6	Develop community controlled social norms and codes to generate revenue through distribution of produce for sustainability.	RBoA	■■■■	■■■■				120,000
2.7	Promote and develop over-sowing of good quality pasture seed on existing grazing areas and under-sowing in the fields of annual and perennial crops.	RBoA, EARO, Mol	■■■■	■■■■				200,000
2.8	Improve both quality and quantity of forage through stock exclusion area.	RBoA, EARO, Mol			■■■■	■■■■		120,000
	<b>TOTAL BUDGET</b>							<b>660,000</b>

A.NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (\$)
3.1	Assign the regional universities and research institutes to assess the nutritional status of animals and the chemical composition of locally available feed resources, nutrient requirements of animals and formulate least cost ration using locally available feed resources.	EARO, MOI, MoA	■ ■ ■ ■	■ ■ ■ ■				50,000
3.2	Promote Ration Balancing Programme (RBPs) through dairy cooperatives, extension services, NGOs. Mandate EAFIA/MoARD to develop user friendly software in conjunction with IT department for ration balancing. (This requires special software development).	MoA, EIAR, EAFIA, Universites, Mol	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			120,000
3.3	Provide the necessary facilities such as weighing balance, measuring tape and ear tags with applicators to trained local extension workers and farmers in the dairy cooperatives and then to individual farmers to apply RBP.	MoA, Mol, RBoA	■ ■ ■ ■	■ ■ ■ ■				50,000
3.4	Incentivize the industries and private entrepreneurs through financial grants, tax holidays and subsidized basic infrastructure to undertake scaling up the production of concentrate mixtures, total mixed rations, complete feeds, high energy ration and pellets, industrial production of bypass nutrients, probiotics, feed enzymes, location specific mineral mixtures, trace element supplements, urea-molasses-mineral blocks, feed blocks, equipments for cattle feed processing, fodder preservation methods. Mol in conjunction with MoA to develop the schemes to promote this initiative.	MoA, Mol,	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			100,000
3.5	Update standards and specifications for several feed ingredients, compounded feeds and forage seeds after need gap assessment.	MoA, EIAR, ESA	■ ■ ■ ■	■ ■ ■ ■				100,000
3.6	Mandate Veterinary Drug and Animal Feed administration and control Authority as a regulatory body for imposing these standards as mandatory.	MoA, Mol	■ ■ ■ ■					20,000
	<b>TOTAL BUDGET</b>							<b>440,000</b>

**DETAILED ACTION PLAN 6.1.2: IMPROVING MILK PRODUCTION THROUGH IMPROVING ANIMAL HEALTH SERVICES**

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Improve bovine health.	Improve bovine health and disease prevention measures through strengthening/developing the infrastructure for identification, surveillance, reporting and training for effective disease diagnosis and control.	
<b>SITUATIONAL ANALYSIS</b>		
There is widespread prevalence of livestock diseases (epizootic, reproductive and zoonotic) and parasites in all agro-ecological zones of the country that cause direct economic losses through mortality and morbidity. Mortality of 8-10% has been reported in indigenous cattle. The major diseases diagnosed include Foot and Mouth Disease, Brucellosis, Listeriosis, Blackleg, Anthrax, Tuberculosis and Mastitis. Morbidity of the diseases has resulted in loss in milk production, slower growth rate, reduced mature body weight and poor reproductive performance. Despite the presence of animal health clinics and provision of clinical services and veterinary drugs through public sector participation at large and private sector at a lesser extent, the constraints like a) shortage and higher cost of veterinary drugs b) weak animal health information system c) weak quarantine and surveillance systems, are hindering the expected livestock production.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
✓ Reduction in mortality and morbidity of cattle on year to year basis in dairy farms.	✓ National roll out initially and enforcement difficult on account of widespread prevalence of diseases in all the agro-ecological zones of the country.	✓ Trail disease prevention measures and reporting systems in limited geographical areas where livestock is an important economic activity.
ACTION PLANS	BUDGET (US \$)	
<ol style="list-style-type: none"> <li>1. Establish an Online Disease Reporting System. Compile and disseminate cattle disease incidence data;</li> <li>2. Provide financial Incentives for immunization of cattle, strengthen national veterinary biological production centers producing vaccines and diagnostic kits and strengthen disease diagnostic laboratories;</li> <li>3. Develop effective veterinary education and training systems and support veterinarians and para-veterinarians to deliver health and AI services;</li> <li>4. Establish a Veterinary Drug and Animal Feed administration and control Authority under MoA.</li> </ol>		
<b>TOTAL BUDGET</b>	<b>2,470,000</b>	

## DETAILED ACTION PLAN 6.1.2: IMPROVING MILK PRODUCTION THROUGH IMPROVING ANIMAL HEALTH SERVICES

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Establish the dedicated computer network linking each region to the Country's central unit.	MoA	■■■■■	■■■■■				200,000
1.2	Introduce an online disease reporting system in the form of National Cattle Disease Reporting System.	MoA						50,000
1.3	Develop an effective national collection, compilation and dissemination system of cattle disease incidence data.	MoA	■■■■■	■■■■■				20,000
2.1	Provide grants to various regions for immunization of cattle against economically important diseases, strengthening of national veterinary biological production centres for the production of vaccines and diagnostic kits and strengthening of disease diagnostic laboratories for reliable diagnosis of cattle diseases.	MoA	■■■■■	■■■■■				800,000
2.2	Upgrade the infrastructure of laboratories for diagnosis of animal diseases having internationally acceptable facilities, infrastructure and standards.	MoA, RBoA	■■■■■	■■■■■				1,200,000
3.1	Design programmes for field veterinarians, para-veterinary personnel and senior-level professional managers on current developments and professional training programmes (quality service to clients and veterinary related technologies) and in-service training to veterinarians and para-veterinarians.	MoA, RBoA	■■■■■	■■■■■	■■■■■			50,000
3.2	Assist the veterinary graduates in setting up private clinics and providing health and AI services at the doorsteps of the farmer under venture capital fund similar to Dairy Venture Capital Fund for setting up of hi-tech dairy farms and feed processing units.	MoA, Universities	■■■■■	■■■■■	■■■■■			50,000
4.1	Undertake quality control, registration of new products and approval of manufacturing and marketing Veterinary drugs, Veterinary vaccines, feed supplements and other substances which are generally used for feeding animals. Mandate the authority to issue professional certificates, control the works of private and public veterinary services including drug stores.	ESQA, MoA	■■■■■	■■■■■				100,000
<b>TOTAL BUDGET</b>								<b>2,470,000</b>

### 6.1.3 IMPROVING MILK PRODUCTION THROUGH IMPROVING ANIMAL BREEDING SERVICES

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Increase number and productivity of milk animals, through improved animal breeding services.	Support production of high genetic merit bulls, semen production and delivery of Artificial Insemination (AI) services.	
SITUATIONAL ANALYSIS		
The Cattle Breeding Policy was drafted to address the preservation and improvement of the known indigenous cattle, sectoral breed substitution programs and elite herd production, crossbreeding programs, artificial insemination and natural mating and herd registration and performance recording, but has not been revisited for implementation. AI and distribution of improved breeds are the two major means of crossbreeding services in the country mainly served through public sector institutions. However, these have been proved to be inefficient and ineffective. Lack of information on the genotype of the bull, shortage and non-replacement of exotic bulls and disease transmission are some of the constraints hindering the production of high genetic merit bulls.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Increased milk production and conception rates using improved breeding services;</li> <li>✓ Extent of Private Sector Participation for efficient delivery of breeding services.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Low capacity of indigenous breeds for genetic improvement;</li> <li>✓ Low skill of milk producers in breed improvement and stock management.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Improved breeding services adaptable to local conditions;</li> <li>✓ Mounting and intensifying extension services in improved breeding programme and herd management.</li> </ul>
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Promotion of Embryo Transfer Technology (ETT) in production of bulls;</li> <li>2. Introduction and promotion of estrus synchronization and subsequent AI service and Establishment of semen producing stations under private-public partnership (PPP) mode in livestock potential regions;</li> <li>3. Development of AI centers on PPP mode in livestock potential regions;</li> <li>4. Establishing and strengthening bull stations in livestock potential areas but inaccessible to AI service;</li> <li>5. Mandating the implementing agency to monitor and regulate the functioning of all semen stations, genetic improvement programmes and AI delivery systems;</li> <li>6. Introduction of AI technicians to dairy coops with all necessary facilities and encouraging the involvement of private sector in service delivery.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>1,950,000</b>



## DETAILED ACTION PLAN 6.1.3 IMPROVING MILK PRODUCTION THROUGH IMPROVING ANIMAL BREEDING SERVICES

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1	Design a programme to produce quality bulls in National Artificial Insemination Centers (NAIC) and future regional AI centers.	NAIC	■■■■					120,000
2	Promote Embryo Transfer Technology (ETT) in production of bulls, in absence of progeny testing.	MoA, NAIC	■■■■	■■■■				60,000
3	Calculate annual requirement for bulls over five year period.	RBoA, MoA	■■■■					60,000
4	Enroll NGOs for specific breeds in the specified pockets to produce the desired number of quality bulls.	MoA, RboA	■■■■	■■■■				120,000
5	Strengthen the semen producing stations with state-of-the-art facilities. Encourage establishment of bigger semen producing and distribution services	RBoA, NAIC	■■■■	■■■■	■■■■			450,000
6	Strengthen disease diagnostics laboratories at regional level to ensure disease-free germplasm production.	RboA, MoA		■■■■	■■■■			230,000
7	Develop the National Germplasm Grid to maintain the information regarding availability of semen of different frozen semen laboratories in the country.	MoA	■■■■	■■■■	■■■■			40,000
8	Establish an information network using computing technologies by establishing a national database.	MoA	■■■■					80,000
9	Establish the new AI centres on PPP mode to provide efficient door-step breeding services to farmers. NGOs and professional breeding service providing organizations should be encouraged to set up these centres and expand their operations	MoA, RboA		■■■■	■■■■			400,000
10	Mandate the Regional Bureau of Agr for the production and supply of breeding inputs and delivering liquid nitrogen and linked to national grid.	MoA, RboA			■■■■	■■■■		40,000
11	Mandate the coordinating agency to monitor and regulate the functioning of all semen stations, genetic improvement programmes and AI delivery systems.	MoA, RboA						120,000
12	Develop field performance recording and evaluation system for indigenous breeds in their native tracts and other parts of the country.	MoA, RboA, coops NGOs						230,000
	<b>TOTAL BUDGET</b>							<b>1,950,000</b>

## 6.1.4 CAPACITY BUILDING AT MILK PRODUCTION LEVEL

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Improve human resource inputs to the dairy sector.	Strengthen institutional capacity building initiatives of dairy farmers, cooperatives, extension staff and other stakeholders with regard to milk production.	
SITUATIONAL ANALYSIS		
The capacity gap at the milk production level remains one of the serious concerns in terms of human resources and knowledge management. At Regional and Federal levels, in most research and training institutes there are problems of getting adequate trained and educated staff. Farmer Training Centers still need additional capacity strengthening interventions. Same is true in terms of reorienting and strengthening the universities and institutions of higher learning to produce skilled and trained dairying personnel. The institutional mechanism for credit counseling, technology counseling and market counseling is weak.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Increase in no of successful operational farmers' clubs in each region/cluster;</li> <li>✓ Increase in enrolment of students by universities for programmes in dairy farm management.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Less active private participation in capacity building initiatives;</li> <li>✓ Less enrolment of students due to non-lucrative career options in this area;</li> <li>✓ The existing EMDTI may deter the establishment of the new center.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Incentive schemes for sponsor agencies other than banks/Govt institutions;</li> <li>✓ Orientation of students on attractive employment opportunities in this domain. Convince the Government that the center's objective is different from that of the institute.</li> </ul>
BUDGET (US \$)		
<ol style="list-style-type: none"> <li>1. Promotion of Farmers' Clubs by Banks (see Note 1)/other agencies including Agriculture Universities, NGOs in livestock development etc.;</li> <li>2. Capacity Building at Universities and Institutions of Higher Learning in Dairy Farm Management;</li> <li>3. Capacity Building of Extension Staff.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>730,000</b>

## DETAILED ACTION PLAN: 6.1.4 CAPACITY BUILDING AT MILK PRODUCTION LEVEL

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Select a village/cluster of villages suitable for launching Clubs/Training Centers in the operational area of the bank branch.	MoA, EDMDI, MOI	■ ■ ■ ■					30,000
1.2	Identify a few progressive dairy farmers and borrowers with good track record of proper loan utilization, aptitude and capacity for team work.	MoA, EDMDI, MOI, RBoA	■ ■ ■ ■					20,000
1.3	Encourage the members to select Coordinator/Volunteer/	MoA, EDMDI, MOI	■ ■ ■ ■					--
1.4	Provide financial assistance for a period of 2-3 years towards formation and maintenance expenses, base level orientation training programme and meet with experts.	MoA, EDMDI, MOI	■ ■ ■ ■	■ ■ ■ ■				400,000
1.5	Encourage members to convene monthly meeting regularly, guide them to have meaningful discussion and take necessary follow-up action.	MoA, EDMDI, MOI	■ ■ ■ ■					--
1.6	Motivate members to identify credit and non-credit needs (training, livestock consultancy, farm infrastructure, inputs etc), prepare an action plan and accordingly arrange for expert talks and counseling with the help of Government departments and other agencies concerned.	MoA, EDMDI, MOI	■ ■ ■ ■					---
1.7	Ensure that the members maintain Membership Register, Meeting Register, Minutes Book and Books of accounts.	MoA, EDMDI, MOI	■ ■ ■ ■	■ ■ ■ ■				---
1.8	Evolve a performance parameter and measure the Clubs' contribution annually. (See Note 2)	MoA, EDMDI, MOI						20,000
2.1	Strengthen the undergraduate, postgraduate and doctorate programmes through increase in no of seats on dairy farming management courses. (See Note 3)	Universities	■ ■ ■ ■	■ ■ ■ ■				--
2.2	Mandate TVETS to develop the modules for vocational courses in dairy farm management for non-dairy professionals.	MoE	■ ■ ■ ■	■ ■ ■ ■				---
3.1	Conduct workshop training on monthly basis for extension staff to gain new theoretical knowledge and share their experiences with each other and training. This can be complemented with On-the-job- learning which would create mutual learning between extension staff and workers.	MoE, RBoE	■ ■ ■ ■	■ ■ ■ ■				100,000
3.2	Organize Cross visits and study tours for learning in the field, particularly between extension staff as they compare farming systems to their own regions on occasional basis.	Mol, MoA	■ ■ ■ ■					100,000
3.3	Organize the staff meetings to share experiences and plan together. Present the progress, outputs and outcomes of activities, get feedback from the field and together solve problems and make plans.	Mol, MoA	■ ■ ■ ■					60,000
	<b>TOTAL BUDGET</b>							<b>730,000</b>

**Note:**

*1 - Farmers' Clubs are grassroots level informal forums of farmers. Such Clubs are organized by rural branches of banks with their support and financial assistance for the mutual benefit of the banks concerned and the village farming community/rural people. Other agencies like NGOs, universities etc. are also included in the formation and promotions of FCs. The formation of Farmers' Club lead to better Banker-Borrower relationship in the area. Some of the advantages the bank can accrued through FCs include:*

- *Increase in deposits;*
- *Increase in the credit flow and diversification of lending;*
- *Generation of new business avenues;*
- *Increase in the recoveries and decline in the non-performing assets;*
- *Reduction in the transaction costs of financial institutions/ Banks;*
- *Socio economic development of the village;*
- *A win-win situation both for the banker and borrower;*
- *Enhancement in bargaining power for bulk purchase of inputs and marketing of their produce.*

*2 - All villagers except willful defaulters can become members of the club. There is no restriction on the number of clubs to be formed a single agency.*

*3 – All universities working in agriculture/dairy sector can form FCs.*

### 6.1.5 STRENGTHENING EXTENSION SERVICES AT MILK PRODUCTION LEVEL

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Develop effective dairy technology and information transfer processes.	Develop dedicated technology transfer centers with support from mass media.	
SITUATIONAL ANALYSIS		
<p>A specialized dairy extension was introduced by Dairy Rehabilitation and Development Project (DRDP) during its five years of implementation (from 1985 to 1993). In the early period of the project, the main focus was on producer cooperatives. Along with working on improving milk production through the production and provision of improved crossbred cattle, the project was involving on addressing technology dissemination of improved husbandry practices by producing a Dairy Technology Manual for extension staff. The extension packages that were developed by the Federal MoARD have been implemented by the Regional Extension Departments and Woreda Extension Teams. The extension packages were implemented under three different agro-ecological zones: areas with adequate moisture, moisture stress areas, and agro-pastoral areas. Under the current set-up each demonstration area will have Farmers Training Centres (FTC) and three Development Agents each from crop agronomy. Livestock husbandry and natural resources will be assigned where as one Animal Health Assistant will be deployed for the development areas. A dairy development package was one of the six livestock husbandry extension packages. But significant obstacles limited their effective implementation. The major limitations are: shortage of genetic materials, insufficient supply of forage crop seeds and insufficient feed supplements. In addition, inadequate supply of credit, insufficient training and advisory services in management techniques had consequences. In general, all extension package performance indicators show that the extension package program in general and the livestock husbandry extension package in particular have not been operating efficiently and effectively as expected.</p>		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
✓ Outreach of extension services.	✓ Reluctance of the farmers to adopt the technologies.	✓ Build up the case of overall benefit to the farmers.
BUDGET (US \$)		
<ol style="list-style-type: none"> <li>1. Establish Agricultural Technology Information Center (ATIC) at EMDTI;</li> <li>2. Establish the Communication Center at Ethiopian Meat and Dairy Technology Institute (EMDTI);</li> <li>3. Create 'Farmers' Technology Transfer Fund' (FTTF);</li> <li>4. Develop and Roll-Out the scheme on "Mass Media Support to Dairy Extension;</li> <li>5. Establishment of Technology Validation Committee in each zone.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>2,130,000</b>

## DETAILED ACTION PLAN 6.1.5: STRENGTHENING EXTENSION SERVICES AT MILK PRODUCTION LEVEL

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Prepare the training modules and calendar for the training programmes regarding scientific methods of breeding, feeding, management and health care of animals.	EMDTI	■■■■	■■■■				100,000
1.2	Organize video shows and group discussion to educate the visitors on clean milk production.	EMDTI	■■■■	■■■■				120,000
1.3	Prepare, publish and supply the scientific literature to interested parties on payment.			■■■■				60,000
1.4	Create helpline no to clarify farmers queries regarding technological interventions to solve their problems related to dairying, information regarding availability of seeds and other management problems.	MoA, EMDTI, MoI, RBoI, RBoA		■■■■	■■■■			50,000
2.1	Create an exhibition unit on scientific dairy husbandry practices.	EMDTI		■■■■				120,000
2.2	House a laboratory for undergraduate and post-graduate students and research work at selected institutes.	Universities		■■■■	■■■■			200,000
2.3	Develop a photography section for providing photographic aid and slide making facilities to the scientists for research and students for dissertations. Prepare the photographic collection and distribution of breeds of cattle and fodders and research work.	Universities, MoA, MoI			■■■■			120,000
2.4	Organize seminars, meetings, conferences through adoption of audio-visual aids to propagate the research findings of the institute to the dairy farmers, village level workers and training programmes for farmers.	EIAR, MoA, MoI				■■■■		100,000
2.5	Organize calf rally/dairy fairs on yearly basis in the villages with the prime objective of exposing the dairy farmers and others to the technological innovations developed by the institute.	MoA, MoI				■■■■		200,000
3.1	Conduct the survey/studies in connection with identification of modern dairy farming technologies as well as marketing.	EIAR, MoA	■■■■					300,000
3.2	Enter into MoU/agreements with national and international research institutions for providing new technologies and also with other agencies for marketing tie-up including corporate houses.	EIAR			■■■■	■■■■		--
3.3	Prepare leaflets, CDs and pamphlets for information dissemination.	MoA, MoI				■■■■		100,000
4.1	Organize orientation programme for producers on the potential use of mass media for strengthening the dairy extension services in the country.	MoA, MOI			■■■■	■■■■		50,000
4.2	Develop knowledge and skills in the content creation, treatment and delivery of the farmer related programmes.	MoA, RBoA, EMDTI				■■■■		70,000

4.3	Prepare programme contents, schedule and broadcasting framework covering a wide spectrum of topics on dairy farming and clean milk production.	MoA, RBoA	■■■■	■■■■					----
4.4	Repeat broadcasts at different time slots to suit the viewer's convenience of different segments of population.	RBoA and regional FM radio and TV stations							----
4.5	Promote live programming with phone-in feature, so that the viewers may interact and participate in the ongoing broadcasts.	RBoA and regional FM radio and TV stations	■■■■	■■■■					----
4.6	Undertake capacity building and training programmes to help upgrade the knowledge and expertise of programme executives, extension workers, field-level officials and other functionaries.		■■■■	■■■■					200,000
5.1	Establish a multidisciplinary Technology Validation Committee (TVC), comprising experts on animal health, production, extension and economics drawn from different organizations in each zone to look after the validation of the technologies developed by any institution falling in the given zone.	MoA, EIAR, EMDTI and High learning institutions				■■■■	■■■■		20,000
5.2	Organize annual meet of the research and educational establishments for review of the various livestock technologies and give recommendations to the ministry/ departments before recommending the technologies for promotion among livestock farmers	EIAR and High learning institutions, MoA, Mol			■■■■	■■■■			120,000
5.3	Organize farmer participatory meetings and farmer-scientists interface in each zone on monthly basis so that the technologies relating to animal health and production are properly assessed at farmers' field and if needed suitable amendments are made.	Zonal agri. offices			■■■■	■■■■			200,000
<b>TOTAL BUDGET</b>									<b>2,130,000</b>

## 6.1.6 IMPROVING FINANCIAL ACCESS AT MILK PRODUCTION LEVEL

Strategic Objective	Enabling Objective	
Improved provision of credit to dairy farmers.	Deliver effective financial solutions to dairy farmers through the development of area specific schemes, redesigning financial products and educating financial institutions and farmers on each other's industry.	
<b>Situational Analysis</b>		
Access to credit by dairy farmers, especially small-scale farmers, is severely constrained by the factors like a limited understanding of the dairy sector on the part of credit staff; the absence of farmer friendly schemes; the high rate of interest on loans; lower borrowing limits; and lack of buy-back arrangement for farmers' produce (milk). Despite the presence of 29 microfinance institutions in Ethiopia, the microfinance sector has not been able to create the demand on account of small credit limits, higher interest rates and low level of area coverage. As a result, most of the small-scale dairy farmers are far from the reach of the desired credit and don't find the lending procedures and regulations governing the credit under this sector as a viable investment proposition.		
Key Performance Indicators	Key Risks/Potential Barriers	Mitigation Plans
✓ Increase in credit flow to dairy farming sector on year-on-year basis.	<ul style="list-style-type: none"> <li>✓ Lack of sufficient landholding for cultivation of green fodder;</li> <li>✓ Limited resources leading to absence of collaterals (<u>borrower's pledge</u> of specific <u>property</u> to a <u>lender</u>, to <u>secure</u> repayment of a loan) to offer;</li> <li>✓ Inability to generate own contribution;</li> <li>✓ Lack of technical skills to make the enterprises more viable.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Financing for fodder cultivation;</li> <li>✓ Waiver of collaterals for small scale farmers through provision of revolving fund to MFIs or guarantee to banks and using a group collateral method;</li> <li>✓ Contract Farming model.</li> </ul>
<b>Action plans</b>		
<ol style="list-style-type: none"> <li>1. Mandate EMDTI in joint association with Extension Directorate of MoA to provide training, research and consultancy services in agricultural and rural development banking;</li> <li>2. Devise and introduce a Farmer Credit Card scheme for farmers with a good track record to provide short term credit/working capital for dairy farming activities/requirements;</li> <li>3. Promotion of Contract Farming Model;</li> <li>4. Roll-out "Dairy Venture Capital Fund" scheme;</li> <li>5. Accord the status of Priority Sector to lending under Microfinance for dairy farming activities.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>190,000</b>



## DETAILED ACTION PLAN 6.1.6: IMPROVING FINANCIAL ACCESS AT MILK PRODUCTION LEVEL

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET US \$)
1.1	Mandate the organization to develop area specific animal husbandry financing schemes including dairy farming, feed processing units, calf rearing and fodder development after thorough potential mapping of the regions.	MoI	■ ■ ■ ■					---
1.2	Undertake stakeholders (farmers, bankers, Ministry officials, consultants) workshop to invite suggestions and feedback on the schemes and modify them to make it more farmer/investor friendly.	EMDTI	■ ■ ■ ■					20,000
1.3	Conduct training programmes for officials of banks and MFIs on the schemes.	EMDTI, MoI	■ ■ ■ ■					50,000
1.4	Circulate the schemes to different banks for implementation.		■ ■ ■ ■	■ ■ ■ ■				----
1.5	Mandate the banks to organize awareness campaigns for farmers to widely circulate the schemes.	MOI, EMDTI	■ ■ ■ ■					----
1.6	Mandate the banks to prepare annual budget (physical units /financial outlay) for financing under these schemes.	MoI, EMDTI	■ ■ ■ ■					----
3	To promote contract farming, prepare the general framework for tripartite agreement (see Note 1) between farmer, banks & cooperative or private dairies.	MOI, MoA, EMDTI		■ ■ ■ ■				120,000
3.1	Circulate the agreement to banks & cooperatives/private dairies for implementation.	MOI, MoA, EMDTI, DBE		■ ■ ■ ■				----
3.2	Mandate the banks to prepare the annual budget (physical units/financial outlay) for financing under contract farming.	MOI, MoA, EMDTI, DBE		■ ■ ■ ■				----
4.1	Mandate EMDTI to implement the scheme throughout Ethiopia and roll out the financial outlay for the scheme. This scheme should have interest free loan from revolving fund and bank loan applicable to agricultural activities.	MoA, MoI, EMDTI		■ ■ ■ ■				----
4.2	Publicize the scheme by widely circulating to the farmers/private investors to create the demand.	MoA, MoI, EMDTI			■ ■ ■ ■			----
5	Accord the status of Priority Sector to lending under Microfinance for dairy farming activities.	EMDTI			■ ■ ■ ■			----
5.1	Mandate CBE/DBE to issue guidelines in this regard and modify the guidelines in terms of increase in total borrowing limit and collateral free loan for dairy farming activities for small scale farmers.				■ ■ ■ ■	■ ■ ■ ■		----
	<b>TOTAL BUDGET</b>							<b>190,000</b>

**Note:**

*1 - A contract farming arrangement is a tripartite agreement between the farmer, bank and an industrial unit (in this case, dairy) which uses the farm product (milk). While the bank finances the farmer for procuring inputs, the industry guarantees purchase and provides the necessary inputs and know-how for dairy farming management. The industry pays the purchase value to the bank which deducts the debt portion and hands over the surplus to farmers.*

*2- Dairy Venture Capital Fund is the scheme for farmers, individual entrepreneurs, dairy cooperative societies, companies, NGOs for setting up of hi-tech dairy farms (say from 10 animal units to 100 animal units) and feed processing plants where the share of entrepreneur's contribution, back ended capital subsidy and bank loan would be minimum 10 %, 25 % and balance (depending upon bank with minimum 40 %) of the outlay respectively.*

### 6.1.7 IMPROVING INSURANCE MODELS DELIVERY SYSTEMS AT MILK PRODUCTION LEVEL

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Introduce livestock insurance.	Provide protection mechanism to the farmers and cattle rearers against any eventual loss of their animals due to death; and demonstrate the benefit of the insurance of livestock to farmers	
SITUATIONAL ANALYSIS		
Most private banks have related insurance companies. There are nine insurance companies, the largest of which is state-owned. Most of the insurance companies have no insurance policies for livestock. A minority of insurance companies have livestock insurance policies. However, their policies lack flexibility and suitability to address the peculiarities of the various livestock holders. In addition, no insurance policies are available on potential losses due to unexpected natural disaster or to cover potential perils for milk products in transit or storage.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
✓ Increase in number of insured cattle.	✓ Disputes during the claim settlement process and identification of reasons for the death of the animal.	✓ Effective Monitoring mechanism.
ACTION PLANS		
Roll out National Livestock Insurance Scheme		
<b>TOTAL BUDGET (USD)</b>		<b>670, 000</b>

## DETAILED ACTION PLAN 6.1.7: IMPROVING INSURANCE MODELS DELIVERY SYSTEMS AT MILK PRODUCTION LEVEL

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1	Roll-out National Livestock Insurance Scheme.							
1.1	Mandate MoA, EMDTI to draft the National Livestock Insurance Scheme covering the following components: a) Insurance of high yielding cattle and cross-breeds at maximum of their current market price. b) Subsidization of insurance premium c) Cost of the subsidy to be borne by GoE d) Policy period of three years	MoA, MOI, EMDTI and insurance companies	■ ■ ■ ■					----
1.2	Conduct the stakeholders' workshop including farmers, cooperatives, dairies, banks, insurance companies to invite the feedback and suggestions. Finalize the draft.	MoA	■ ■ ■ ■					40,000
1.3	Mandate EMDTI, as the National Implementing Agency of the scheme with the assistance of regional implementing agencies.	MOI, EMDTI, RBoA, RBoI	■ ■ ■ ■					
1.4	Appoint the Chief Executive Officer (CEO) at EMDTI or MoA and regional implementing agencies to implement the scheme.	Insurance companies		■ ■ ■ ■				
1.5	Roll-out the scheme in pilot districts first identified through suitable potential mapping exercise undertaken by MoA.	RBoA, RBoI, insurance companies		■ ■ ■ ■				60,000
1.6	Undertake the selection of insurance companies through competitive bidding process on the basis of premium rates offered, capacity to provide services, terms and conditions & service efficiency through quotations.	MoA and RBoA		■ ■ ■ ■				20,000
1.7	Select the veterinary practitioners at the village level for the successful implementation of the scheme. They are to be associated with the work of identification and examination of the animals to be covered under the scheme, determination of their market price, tagging of the insured animals and finally issuing veterinary certificates as and when a claim is made.	EMDTI						----
1.8	Prepare the list of veterinary practitioners for each region and made it available to the insurance company selected for the region.	RBoA			■ ■ ■ ■			20,000
1.9	Delegate the preparation of monthly statements of the policies issued indicating the assessed value of each animal and the Government share for each region by the insurance company and submission to the CEO so that, that much amount can be recouped to the insurance	Insurance companies						35,000

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
	company by the CEO.							
1.10	Mandate the identification of the beneficiaries to regional level implementing agencies.	Insurance companies			■ ■ ■ ■			----
1.11	Mandate the determination of market price of animal to beneficiary, authorized veterinary practitioner and insurance agent.	Insurance companies			■ ■ ■ ■			-----
1.12	Spell out clear cut procedures for settlement of claims and list out the required documents. Make them available to concerned beneficiaries along with the policy documents.	WAO and Insurance companies			■ ■ ■ ■			-----
1.13	Monitor the implementation of the scheme in terms of financial releases, no of animals insured and type of insurance.	Insurance companies			■ ■ ■ ■			-----
1.14	Roll out the fund for payment to the veterinary practitioners the honorariums for insuring the animal and issuance of veterinary certificate. Mandate CEO with this responsibility.	MoA, EMDTI, MoI				■ ■ ■ ■		120,000
1.15	Undertake the awareness campaigns along with the selected insurance companies among the cattle owners.	EMDTI, MoA, RBoA, RBoI				■ ■ ■ ■		60,000
1.16	Incorporate the insurance component in MFI schemes. MFIs such as OSCSC and ACSI have insurance service associated with the death of the borrower. This service can be developed to incorporate livestock insurance services.							-----
	<b>TOTAL BUDGET</b>							<b>670,000</b>

### 6.1.8 QUALITY AND SAFETY AT MILK PRODUCTION LEVEL

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Ensure quality and clean milk production at farm level.	Implement proper milk quality and safety systems and procedures.	
SITUATIONAL ANALYSIS		
There is no comprehensive food safety policy in Ethiopia. There is a lack of robust legislation to monitor the usage of various inputs like veterinary chemicals, water and stock feed for milk production. The food control activities are scattered among various regulatory bodies and appear to lack co-ordination. Inspection remains random and a clearly defined inspection and implementation body, with the responsibility and authority to implement food related safety measures from farm to fork, is absent. The food safety system of Ethiopia lacks a structured food borne disease and contaminant surveillance and risk assessment system. Low capacity in terms of infrastructure development and HRD are some of the constraints hindering the development of robust food quality and safety systems and procedures.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
✓ Improvement in hygienic quality, sensory quality, nutritional quality and technological quality (processing) for intended use of processing and consumption.	✓ Reluctance from dairy farmers/producers to adopt the food quality and safety systems.	✓ Introduce quality based incentives to the farmers.
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Preparation of Comprehensive National Food Safety and Quality Policy;</li> <li>2. Preparation of a framework for the production &amp; usage of stock feed and veterinary chemicals in compliance with the yet-to-be operational proclamation on Vet drugs and Animal Feed Administration and Control;</li> <li>3. Accreditation of stock feed and grains industries with QA programmes;</li> <li>4. Development and Implementation of National Livestock Identification System (NLIS);</li> <li>5. Designing &amp; documentation of Food Safety Programmes;</li> <li>6. Testing, certification and inspection infrastructure development;</li> <li>7. Development of a structured food borne disease &amp; contaminant surveillance &amp; risk assessment system;</li> <li>8. An incentive-based payment to the farmers for clean and quality milk production.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>	<b>1,750,000</b>	

## DETAILED ACTION PLAN 6.1.8: QUALITY AND SAFETY AT MILK PRODUCTION LEVEL

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1	Mandate the National Food Safety Council to prepare a comprehensive National Food Safety and Quality policy whereby all the dairy supply chain components are covered. Under the policy define Farm and Post-farm regulations for assuring the quality and safety of raw milk production.	EMDTI, EQSA, MoA, MOI	■ ■ ■ ■					----
2	Mandate the same Authority to prepare the framework for the types of chemicals that can be used for the production of stock feed and veterinary chemicals used for treatment of cattle along with the recommended withholding periods.	EMDTI, EQSA, MoA, MOI	■ ■ ■ ■					----
3	Accreditation of stock feed and grains industries with HACCP based QA programmes to ensure that the feed is safe for use by dairy animals.	EQSA	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		210,000
4	Develop and implement the National Livestock Identification System (NLIS) which would provide the framework for the identification of Ethiopian livestock. Maintain the system for documentation and record keeping.	EMDTI	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	500,000
5	Develop/Strengthen the legislation that would ensure that fertilizers are appropriately labeled and maximum limits are set for elements that may pose a risk to agriculture.	EQSA		■ ■ ■ ■				120,000
6	Design and document food safety programmes (FSPs) for dairy farms. Approve them before a dairy farm license is granted. Conduct the regular audits of farm food safety programmes through approved auditors. Core elements of the FSP include: (Control of contaminants – physical, chemical and microbiological; Dairy milking premises; Hygienic milking; Water supply and quality; Cleaning and sanitizing ; Traceability and records; Personnel hygiene and competency )	EQSA and EMDTI		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		300,000
7	Upgrade the capacities of laboratories of the Ethiopian Health and Nutrition Research Institute (EHNRI), Microbiology Public Health Laboratory and the Public Health Chemistry Laboratory supported by six regional testing laboratories, chemical and microbiological laboratories of ESA so that they are able to perform complex tests such as pesticide residues, aflatoxins, and contamination in milk.	EHNRI			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	300,000
8	Develop the structured food borne disease and contaminant surveillance and risk assessment system. Provide the framework for data capture on food contaminants and food borne diseases which would act as a base reference for developing the requisite food safety systems.	EHNRI, EQSA			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	220,000
9	Develop the quality based incentive schemes to the producers for quality and clean milk production. Develop the framework of the parameters which would be used as a guideline for the quality and clean milk production.	EHNRI, EQSA, MoI, EMDTI						100,000
	<b>TOTAL BUDGET</b>							<b>1,750,000</b>

### 6.1.9 RESEARCH AND DEVELOPMENT ACROSS THE MILK VALUE CHAIN

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Improve research and development initiatives relevant to small-scale farmers in the dairy sector.	Promote market-driven dairy Research and Development across the value chain.	
<b>SITUATIONAL ANALYSIS</b>		
<p>Formal Research and Development (R&amp;D) efforts for dairy sector development began in the late 1940s and continue to the present, mainly through donor-financed dairy and livestock development projects. A close scrutiny of various projects, policy and research documents reveal that they are mainly supply-driven initiatives, emphasizing the transfer of technology and public provision of inputs and services.</p>		
<p>Various national and regional research institutions have engaged in dairy and feed research activities. The Holleta Agricultural Research Center, Melkassa Agricultural Research Center, Debre Zeit Agricultural Research Center, Adami Tullu Research Center, Bako Agricultural Research Center, and Werer Agricultural Research Center are engaged in breed improvement, forage development, animal health service improvement, on-farm crossbred heifer and improved forage demonstration, and milk processing technology and equipment demonstration works. The faculties of Animal Science and Veterinary Medicine of Haramaya University and Hawassa University, the National Veterinary Institute, and ILRI also undertake animal health research, vaccine production, and dairy and forage research activities respectively.</p>		
<p>Some evidences show that national dairy research systems have generated useful technology, knowledge and information over the past decades, particularly in areas such as genetic improvement, fodder and feeds development, nutrition and feeding strategy, animal health and vaccine, and milk handling and processing technology. However, this has had limited impact on the development of smallholder dairy in the country. Historically, non-technical issues have received little attention by the national dairy and feed research. An inventory of the dairy and forage-related research activities of the different research centers revealed that research continues to focus on technical issues.</p>		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Extent of fund utilization from the Annual (national) budget allocation for applied R&amp;D targeting small scale dairy farms, large and medium scale dairy farms, dairy cooperatives, processing and marketing;</li> <li>✓ Realization of efficiencies and improvements in production systems in quantitative and qualitative terms by farmers and farming communities;</li> <li>✓ Extent of commercialization of R &amp; D outputs across dairy value chain.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Low Budget for R&amp;D by Government.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Encourage the private sector contribution to support Dairy R &amp;D in line with their interest.</li> </ul>
<b>ACTION PLANS</b>		
<ol style="list-style-type: none"> <li>1. Identification of gaps in the national dairy research program and supporting the research system to address the identified gaps.</li> <li>2. Promote Collaborations and Partnerships in Dairy R &amp; D.</li> <li>3. Encourage Private Sector Participation in Dairy R &amp; D initiatives.</li> <li>4. Development/Evolution of Centres of Excellence</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>1,810,000</b>



## DETAILED ACTION PLAN 6.1.9: RESEARCH AND DEVELOPMENT ACROSS THE MILK VALUE CHAIN

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Establish the Dairy & Livestock Research and Technology Division within EMDTI	EMDTI	■■■■	■■■■				400,000
1.2	Review the acts and policies pertaining to the agricultural research to provide a basis for the implementation of this strategy and establishment of a board of governance for dairy research in NDRS.	EMDTI		■■■■				50,000
1.3	Review the National Dairy Research Framework and Agenda emanating from Livestock Research Policy, Cattle Milk Research Strategy and Animal Health Research Strategy.	EMDTI		■■■■				20,000
1.4	Advocate for public research budgetary allocation for various types of research programmes to various research institutions within the country on equitable and competitive basis.	EMDTI, MoI		■■■■				50,000
1.5	Conduct impact monitoring of research projects and programmes on various target groups and the dairy sector as a whole.	EMDTI, MoI				■■■■		120,000
1.6	Coordinate with educational systems to address the identified gaps in terms of required research competency at various educational levels.	EMDTI, MoI		■■■■	■■■■	■■■■	■■■■	----
1.7	Identify the gaps in the research-extension-farmer forum and strengthening it.	EMDTI, MoI		■■■■	■■■■	■■■■	■■■■	----
1.8	Provide support to the forum with organizational and administration oversight for establishment and running the national priority setting process.	EMDTI			■■■■			60,000
1.9	Develop and identify the national research agenda and priorities across dairy value chain.	EMDTI		■■■■	■■■■	■■■■	■■■■	----
1.10	Formulate recommendations for MoA and MoI on the national priorities and allocations for dairy research and technology development.	EMDTI				■■■■		----
1.11	Prepare the documentation for discussion and decision making at forum meetings.	EMDTI		■■■■	■■■■	■■■■	■■■■	60,000
2.1	Conduct a thorough investigation of the best forms of international collaboration and determining the role, cost and benefits of participation in various international networks and in exchanging university-level students.	EMDTI						40,000
2.2	Establishing incentives, programmes and rules for scientists' international collaboration.	EMDTI		■■■■	■■■■			----
2.3	Identify and secure medium to long-term financial resources and potential supplementary sources required for international partnerships.	EMDTI		■■■■	■■■■			---

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
2.4	Develop a competitive, matching grant system to promote innovative partnerships. The grant system should be a component of the national competitive funding arrangements of the dairy R&D strategy.	EMDTI		■ ■ ■ ■				-----
2.5	Develop and implement training programmes in collaborative research for both scientists and research managers to ensure skills development in building and managing collaborative and complex partnerships.	EMDTI	EMDTI	EMDTI	EMDTI	EMDTI		160,000
3	Encourage private sector participation in dairy R & D initiatives.	EMDTI						-----
3.1	Provide grants for installation of research equipments and setting up of infrastructure for the research institutions.	EMDTI, MoI						300,000
3.2	Provide training to researchers and research managers in the public sector.	EMDTI, MoI	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	280,000
3.3	Participate in commercialization of R & D products and patenting for the benefit of Ethiopian society and economy.	MoST, EMDTI, MoI	■ ■ ■ ■	■ ■ ■ ■				40,000
3.4	Market Ethiopian research and technology outputs nationally.	MoST, EMDTI, MoI			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	60,000
3.5	Encourage R & D activities by providing assistance to dairy based industries for sponsored research work undertaken by reputed research institutions up to 50% of the cost.	MoST, EMDTI, MoI			■ ■ ■ ■	■ ■ ■ ■		150,000
4.1	Conduct a sectoral analysis of the kinds of innovative approaches and requirements for new or improved institutions and or centres of repute and excellence in key strategic areas.	MoST, EMDTI, MoI			■ ■ ■ ■	■ ■ ■ ■		60,000
4.2	Invite expression of interest to encourage existing institutions/industry-based research centers, international dairy research centres to realign their mandates and focus towards national priorities.	MoST, EMDTI, MoI			■ ■ ■ ■			----
4.3	Promote Farmers Dairy Research Groups as a one of the strategy for promoting research and development in the dairy sector.	MoST, EMDTI, MoI			MoST	EMDTI	MoI	-----
	<b>TOTAL BUDGET</b>							<b>1,810,000</b>

### 6.2.1 MILK PROCUREMENT INFRASTRUCTURE

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Reduce wastage during milk procurement, transit and storage.	Develop the cold chain infrastructure for milk procurement and storage and strengthen infrastructure at selected milk collection centers.	
<b>SITUATIONAL ANALYSIS</b>		
<p>Delays in collecting milk from the farmers and transporting to processing plants contribute to high incidences of spoilage. Unreliable and unhygienic processing methods also contribute to poor product quality. The use of substandard milk collecting utensils and buckets collecting the milk from the supply centres, where many smallholders sell milk, may result in poor milk quality. Similarly, the absence of chilling and cooling centres at milk-producing and supply areas also cause a deterioration of milk quality. Limited access to milk collection centres leads to high post-harvest loss. Private and cooperative firms lack collection centres and facilities.</p> <p>In addition, substantial amounts of milk are spoiled in transit. This is due to the substandard containers and mode of transport used to collect and transport milk leads to delays and high temperature build-up in the milk. Thus, investment opportunities exist in establishing well-managed milk collection centre as well as reliable milk distribution facilities including transport facilities and cold chains.</p>		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Increased milk procurement volumes:</li> <li>✓ Enhanced hygienic, sensory, nutritional and technological quality of milk:</li> <li>✓ Establishment of dairy coops/and or strengthening milk sheds.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Infrastructure issues (lack of all-weather roads, electrical supply for chilling centers, potable water supply etc) hindering the development of procurement infrastructure:</li> <li>✓ People prefer relatively cheaper milk and milk products which makes providers of high quality milk uncompetitive.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Milk procurement infrastructure development in potential areas considering easy availability of infrastructure.</li> <li>✓ Consumer awareness of quality and safety Aspects.</li> </ul>
<b>ACTION PLANS</b>		
<ol style="list-style-type: none"> <li>1. Develop and implement the scheme on dairy cold chain infrastructure development;</li> <li>2. Conduct a national level potential milk procurement mapping to develop Milk Collection Centers.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>340,000</b>

## DETAILED ACTION PLAN 6.2.1: MILK PROCUREMENT INFRASTRUCTURE

ACTIVITY/SUB- ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Draft the scheme on providing financial assistance through credit linked subsidy to the private investors/entrepreneurs interested in developing the cold chain backward and forward infrastructure. (bulk milk coolers, refer vans, chilling centers).	EMDTI, MoI, MoA	■ ■ ■ ■					40,000
1.2	Organize the stakeholders' workshop to publicize the scheme and incorporate the suggestions/feedback of the stakeholders to improve the scheme.	EMDTI, MoI, MoA	■ ■ ■ ■					20,000
1.3	Launch the scheme in phased manner starting from the potential regions in coordination with banks/financial institutions and MoI	EMDTI, MoI, MoA	■ ■ ■ ■					-----
2.1	Organize village level surveys including cooperatives and unions in each zone to estimate marketable surplus milk and find out the potential for future growth in milk production apart from connectivity, road conditions etc.	EMDTI, MoI, MoA		■ ■ ■ ■				120,000
2.2	Identify the potential for Milk Collection Centers and develop the milk collection routes while taking into account number of villages, quantity of milk available per shift, distance from dairy, distance from village to village, road condition, time taken for milk transportation from first pickup point to the time of reaching the dairy plant.	EMDTI, MoI, MoA	■ ■ ■ ■					60,000
2.3	Organize the meetings with the farmers in identified villages for confidence building.	EMDTI, MoI, MoA, RBoA, RBoI		■ ■ ■ ■				40,000
2.4	Identify the cooperatives and private investors keen on developing the Milk Collection Centers through competitive selection process.	EMDTI, MoI, MoA, RBoA, RBoI		■ ■ ■ ■				60,000
2.5	Provide financial assistance to cooperatives/private investors in form of aid/grant for developing the procurement infrastructure.	EMDTI, MoI, MoA, RBoA, RBoI		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	
<b>TOTAL BUDGET</b>								<b>340,000</b>

### 6.2.2 QUALITY AND SAFETY DURING MILK PROCUREMENT

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Establish appropriate milk quality and safety systems and procedures for milk procurement.	Ensure quality and clean milk procurement and storage at collection center level and efficient transportation of milk to the processing center.	
SITUATIONAL ANALYSIS		
<p>A large number of Milk Collection Centers and dairy plants are managed by inexperienced workers or by farmers with insufficient knowledge of Good Manufacturing Practices (GMP). This leads to such conditions as: low product quality, non standardization of products, unsafe products and low competition potential.</p> <p>The dairy processors' demands for better quality milk are putting increased pressures on Milk Collection Centers supply higher quality milk. In Ethiopia, there is currently no Milk Collection Center operating with Good Milk Handling (GMH) standards. There is also a general lack of GMP being standardized and followed in the milk value chain. This inconsistency throughout the dairy food chain results in products of variable quality and inconsistent taste.</p>		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
✓ Amount of milk tested below national standards on total somatic cell count and total bacteria count.	✓ Reluctance from dairy farmers/producers to adopt the food quality and safety systems.	✓ Introduce quality based incentives to the farmers.
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Preparation of Comprehensive National Food Safety and Quality Policy incorporating milk procurement issues;</li> <li>2. Development of training modules and impart of training programmes for clean milk procurement;</li> <li>3. Distribution of hygienic kits at the collection centers;</li> <li>4. Incentivize farmers implementing clean milk production and procurement systems and techniques.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>490,000</b>

## DETAILED ACTION PLAN 6.2.2: QUALITY AND SAFETY DURING MILK PROCUREMENT

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Design and document food safety programmes (FSPs) for milk transport operators. Core elements of the FSP include: (control of food safety hazards during collection and transport from equipment, vehicles, containers and personnel, product traceability, time & temperature controls, personnel skills and knowledge)	EQSA, EMDTI, MoI, MoA, RBoA, RBoI	■ ■ ■ ■	■ ■ ■ ■				60,000
1.2	Assist the milk collection centers to implement the GMH/GMP at an acceptable level through facilitation of necessary accreditation and certification by unions and government.	EMDTI, MoI, MoA, RBoA, RBoI	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	120,000
2.1	Provide training sessions for farmers to bring milk in clean vessels and workers in collection centers entrusted with the responsibilities of milk collection, testing, record keeping and in ensuring that milk collection center is neat and clean.	EMDTI, MoI, MoA, RBoA, RBoI	■ ■ ■ ■					60,000
3	Distribute the 'hygiene kits' for use at the collection centre level. These consist of nail cutter, towel, dusters and toilet soap for the hygienic practices of the staff. This kit also includes chemicals for detection of adulterants, glassware for MBRT test like beakers, pipette, test tubes, spirit lamp, spirit, stainless steel tray and stainless steel tube stand.	EMDTI, MoI, MoA, RBoA, RBoI	■ ■ ■ ■	■ ■ ■ ■				210,000
4	Incentivize the farmers through payment of premiums per litre of milk through clean milk production and procurement systems and techniques.	EMDTI, MoI, MoA, RBoA, RBoI	■ ■ ■ ■	■ ■ ■ ■				40,000
	<b>TOTAL BUDGET</b>							<b>490,000</b>

### 6.2.3 CREDIT FACILITIES DURING MILK PROCUREMENT

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Improved credit provision to dairy cooperatives, private dairy processors and milk cooling, transportation and storage equipment suppliers.	Deliver effective financial solutions and schemes to the dairy cooperatives, private dairy processors and equipment suppliers through development of product specific schemes, redesigning of financial products and training to bankers on milk procurement component.	
SITUATIONAL ANALYSIS		
Access to credit for this component of value chain is severely constrained by the factors such as limited understanding of the sector by the credit staff, absence of investor friendly schemes, high interest rates and lower borrowing limits. As a result, most of the private investors do not find the lending procedures and regulations governing the credit under this sector as a viable investment proposition. Moreover, presence of fewer cooperatives has not created the strong lending base by the banks under this component.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
✓ Increase in ground level credit flow to milk procurement and storage component on year-on-year basis.		
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Establish an autonomous organization promoted by the MoA to provide training, research and consultancy services in agricultural and rural development banking;</li> <li>2. Orientation of banks and other financial institutions to provide the credit for cold chain Infrastructure projects under credit linked subsidy scheme;</li> <li>3. Provide the framework for buyers credit say for cooling equipment provided by the bigger processors to a number of bulkers and also quality testing and volume measuring equipment to contracted transporters.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>180,000</b>

## DETAILED ACTION PLAN 6.2.3: CREDIT FACILITIES DURING MILK PROCUREMENT

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Establish mandate an autonomous organization promoted by the MoA, MoI and EMDTI to develop the schemes for financing dairy cooperatives and private dairy processors to establish the bulk milk coolers, refrigerated trucks and milk collection and testing infrastructure.	EMDTI, MoA, MoI	■ ■ ■ ■					120,000
1.2	Undertake stakeholders (cooperatives, bankers, Ministry officials, consultants, private dairy processors) workshop to invite suggestions and feedback on the schemes and modify them to make it more farmer/investor friendly.	EMDTI, MoA, MoI	■ ■ ■ ■					20,000
1.3	Conduct the training programmes for officials of banks on the schemes.	EMDTI, MoA, MoI	■ ■ ■ ■					40,000
1.4	Circulate the schemes to different banks for implementation.	EMDTI	■ ■ ■ ■					----
1.5	Mandate the banks to organize the awareness campaigns for cooperatives and private players to widely circulate the schemes.	EMDTI, MoA, MoI		■ ■ ■ ■				-----
1.6	Mandate the banks to prepare the annual budget (physical units /financial outlay) for financing under these schemes.	EMDTI, MoA, MoI		■ ■ ■ ■				-----
2	Orient banks and other financial institutions to provide credit for cold chain infrastructure projects under the credit linked subsidy scheme.	EMDTI, MoA, MoI		■ ■ ■ ■				-----
3	Provide the framework for buyers credit say for cooling equipment provided by the bigger processors to a number of bulkers and also quality testing and volume measuring equipment to contracted transporters	EMDTI, MoA, MoI, Banks		■ ■ ■ ■				-----
<b>TOTAL BUDGET</b>								<b>180,000</b>



### 6.2.4 IDENTIFYING AND SUPPORTING MILK COOPERATIVES

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Professionalize management and enhance competitiveness of dairy cooperatives.	Identify dairy cooperatives assess managerial-related challenges facing each cooperative. Assess the business model of cooperatives versus best practices in Ethiopia and abroad to enhance competitiveness.	
<b>SITUATIONAL ANALYSIS</b>		
Many dairy cooperatives and unions are also engaged in milk collection, semi-processing and marketing in Ethiopia. There are about 110 primary dairy cooperatives and 9 dairy cooperatives unions engaged in dairy businesses. Federal and regional cooperative agencies assist in organizing dairy cooperatives and in linking them to markets and dairy processing industries. Cooperatives and unions are known for their limited organizational capacity. The major constraints faced by the cooperatives include the limited capital, weak communal thinking along with a governance system which is not enabling for continuity of leadership and management. In addition, most cooperatives' members lack commitment to achieve the common goal of the cooperatives.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Increase in number of cooperatives;</li> <li>✓ Increase in number of member farmers;</li> <li>✓ Increased procurement / processing capacity, gross capital formation and value added.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Inability to ensure active membership;</li> <li>✓ Inability to attract &amp; retain competent professionals;</li> <li>✓ Inability to raise the funds to infuse in the cooperatives from the market. some milk sheds are far and inaccessible to transport.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Define the term "active member", right to vote and contest only to active members;</li> <li>✓ Provision of experts / subject matter specialists with periodical trainings;</li> <li>✓ Explore the various forms of the financial instruments;</li> <li>✓ Hiring of well experienced professional managers.</li> </ul>
<b>ACTION PLANS</b>		
<ol style="list-style-type: none"> <li>1. Human resource development of dairy Cooperatives;</li> <li>2. Establishment of national dairy confederation;</li> <li>3. Capital formation and financial sustainability;</li> <li>4. Collaboration of dairy cooperatives with training, research and extension institutions;</li> <li>5. Improvement of the cooperative financial and physical data management system.</li> </ol>		
<b>TOTAL BUDGET</b>	<b>630,000</b>	

## DETAILED ACTION PLAN 6.2.4: IDENTIFYING AND SUPPORTING MILK COOPERATIVES

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Mandate dairy cooperatives to undertake member awareness and education programmes on a continuing basis in order to sensitize members regarding their rights, responsibilities/obligations in respect of the organization to which they belong.	EMDTI, MoA, Mol	■ ■ ■ ■					-----
1.2	Promote organization of women's thrift and credit groups/cooperatives and the concept of "Family Membership" to facilitate the women and youth participation at a larger level.	EMDTI, MoA,	■ ■ ■ ■					60,000
1.3	Conduct the training programmes for the cooperative leaders/representatives on cooperative and business management on periodical basis. Work-out the manual for such training.	EMDTI, MoA, Mol, RBoI, RBoA						40,000
1.4	Identify gaps in the programmes run by the universities in cooperatives business and support the universities in filling up its gaps.	EMDTI, MoA, Mol, Universities		■ ■ ■ ■				20,000
1.5	Spell out in broad terms of the Human Resource Development policy of the cooperatives in their by-laws. Cover all stakeholders' viz., members, employees, Board of Directors and should specify manpower planning, recruitment procedures, professionalization. Reserve certain proportion of the annual budget of the society for training and member education and skill upgrading at all levels.	EMDTI, MoA, Mol, Universities, EMDTI, MoA, Mol, Universities		■ ■ ■ ■				60,000
2	Establish a National Dairy Confederation to foster the partnerships among cooperative unions and primary cooperatives, in order to enhance the coordination of import/export activities.	EMDTI, MoA, Mol,		■ ■ ■ ■				30,000
2.1	Delegate the confederation to participate in policy dialogue and represent cooperatives in national and international level forums.	EMDTI, MoA, Mol			■ ■ ■ ■			-----
3.1	Introduce the schemes for GoE for budgetary provision for soft loans to farmers for share capital participation.	EMDTI, MoA, Mol			■ ■ ■ ■			-----
3.2	Develop a framework for setting up an umbrella organization to function as an aggregator that is promoted and owned by the cooperatives. Structure this organization as a corporate body and to have the financial clout to source funds from the markets for the cooperatives.	EMDTI, MoA, Mol	■ ■ ■ ■					60,000
3.3	Undertake the mapping of under-performing cooperatives in the country.	EMDTI, MoA, Mol	■ ■ ■ ■					60,000

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
3.4	Develop and implement the scheme for "Assistance to Cooperatives" to revitalize under-performing cooperatives. Provide financial assistance to under-performing cooperatives in form of grant to be shared between central and regional levels to the maximum extent of accumulated cash losses.	EMDTI, MoA, Mol		■ ■ ■ ■				120,000
4	Collaborate cooperatives with training, extension and research institutions to provide technical advisory services and knowledge in the areas of milk production, procurement, processing, marketing and price information in the market using different medias such as open field days, workshops and feed-back meetings, exchange visits, production of brochures, posters, leaflets, and information dissemination through program partners via their communication tools and networks.	EMDTI, MoA, Mol		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	60,000
5	Improve the cooperative financial and physical data management system. Establish the cooperative database and regularly update to include newly registered cooperatives and deletion of deregistered cooperatives. Develop the monitoring mechanism for reporting.	EMDTI, MoA, Mol		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	120,000
	<b>TOTAL BUDGET</b>							<b>630,000</b>

### 6.3.1 MILK PROCESSING TECHNOLOGY

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Increased value added output of Ethiopian dairy processing plants.	Improve the milk processing capacities of the existing facilities, in terms of the quality of the product and its packaging; and the number of products that processors are able to produce (such as yogurts, cheese, UHT, etc.)	
SITUATIONAL ANALYSIS		
Raw, pasteurized, UHT and powder milk, butter, cheese, sour milk and yoghurt are the products which are currently sold in Ethiopian market. Market demand is met through local production and imports. The demand of most of these products is expected to increase though no specific market studies have been conducted on the same. Moreover, due to milk deficit situation, most of the processing plants are running under capacity. With uneven supply and high cost of packaging materials, the investment in processing and packaging technology in the country has not witnessed a positive trend. Most of the existing processing facilities lack the state-of-the-art technologies for the manufacture of value added dairy products.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Improvement in the milk processing capacities of the existing facilities;</li> <li>✓ Less dependence on import of value added milk products.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Milk Deficit situation in the country;</li> <li>✓ Less demand of processed milk products on account of seasonal issues.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Undertake measures to improve milk production;</li> <li>✓ Focus on powdered milk segment in wake of uneven supply of milk.</li> </ul>
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Commissioning of studies in the areas of milk and milk products consumption and market;</li> <li>2. Technology upgrading of the existing processing facilities;</li> <li>3. Strategic alliance with the leading dairy processing technology manufacturers and suppliers.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>330,000</b>

## DETAILED ACTION PLAN 6.3.1: MILK PROCESSING TECHNOLOGY

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Commission the studies in the following areas with special focus on the products popular in Ethiopia including but not limited to powdered milk, flavored yoghurt and UHT milk, butter, ghee, cheese, cultured milk, cream and ice cream; Milk consumption; Demand estimation for milk and milk products; Innovations required in marketing of milk and milk products	EMDTI, MoA, MoI	■ ■ ■ ■					60,000
1.2	Publicize the results and analysis to the prospective investors, research and learning institutions.	EMDTI, MoA, MoI	■ ■ ■ ■					10,000
2.2	Utilize the services of the private consultants in the areas of: (Detailed design and engineering; Preparation of tenders and invitation of quotations from project contractors for civil, electrical and mechanical works and plant commissioning; Guide GoE to fulfill all mandatory stipulations concerning the product and the project; Supervision of civil works; Assist GoE in placement of orders for plant and machinery; Supervision of fabrication of critical equipment; Supervision of installation of plant and machinery at factory site; Testing of the equipments; Developing partnership model; Pre-marketing the project to potential private sector developers/project partners; Invitation to strategic partners/entities; Tender process management	EMDTI, MoA, MoI	■ ■ ■ ■	■ ■ ■ ■				200,000
3	Undertake strategic alliance with the leading dairy processing technology manufacturers and suppliers in the areas of Technology transfer through research in new product development, processing and packaging and Market information on products	EMDTI, MoA, MoI		■ ■ ■ ■				60,000
	<b>TOTAL BUDGET</b>							<b>330,000</b>

### 6.3.2 QUALITY AND SAFETY DURING MILK PROCESSING

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Ensure quality and safe production of milk and milk products for domestic consumption and exports.	Implement proper milk quality and safety systems and procedures.	
SITUATIONAL ANALYSIS		
There is no comprehensive food safety policy in Ethiopia. The food control activities are scattered among various regulatory bodies and appear to lack in co-ordination. Inspection remains random and a clearly defined inspection and implementation body, with the responsibility and authority to implement food related safety measures from farm to fork is absent. The food safety system of Ethiopia lacks a structured food borne disease and contaminant surveillance and risk assessment system. Low capacity in terms of infrastructure development and HRD are some of the constraints hindering the development of robust food quality and safety systems and procedures.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
✓ Improvement in hygienic quality, sensory quality, nutritional quality and technological quality of market milk and milk products intended for domestic consumption and exports.	✓ Reluctance from dairy processors to adopt the food quality and safety systems.	✓ Assistance in Compliance of the Quality and Safety Norms.
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Finalization of milk and milk products safety policy and plan of action for safety and quality of milk and milk products;</li> <li>2. Promotion of consumer education;</li> <li>3. Develop a management review process;</li> <li>4. Establishment of milk- borne disease surveillance system;</li> <li>5. Development and organization of training programmes for milk handlers, inspectors and analysts in milk safety assessment;</li> <li>6. Inspection of registered dairy units.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>1,050,000</b>

## DETAILED ACTION PLAN 6.3.2: QUALITY AND SAFETY DURING MILK PROCESSING

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Design and document food safety programmes (FSPs) for dairy processing plants. Approve them before a dairy plant license is granted. Conduct the regular audits of farm food safety programmes through approved auditors. Core elements of the FSP include: (pathogen reduction technologies including pasteurization; temperature controls; storage ; traceability forwards and backwards through the supply chain from farm to customer ; post-pasteurization hazard management ; raw material and ingredient management ; records and personnel competency	EMDTI, MoA, Mol; EQSA	■■■■	■■■■■				40,000
1.2	Develop and implement the system and plan of frequency of dairy inspection activities. Prioritize the frequency of the dairy inspection activities according to the risk, say with comparatively high-risk milk products being given the priority.	EMDTI, MoA, Mol; EQSA	■■■■	■■■■■				----
1.3	Prepare and disseminate a code of practice for inspectors; prepare materials for and train inspectors in the code of practice, modern inspection techniques and sampling procedures in accordance with Codex Alimentarius.	MoA	■■■■	■■■■	■■■■			40,000
1.4	Maintain the coordination with other government agencies whose work influences food safety directly or indirectly.	Mol, EMDTI	■■■■	■■■■	■■■■	■■■■	■■■■	---
1.5	Upgrade the capacities of laboratories of the Ethiopian Health and Nutrition Research Institute (EHNRI), Microbiology Public Health Laboratory and the Public Health Chemistry Laboratory supported by six regional testing laboratories, chemical and microbiological laboratories of ESA so that they are able to perform complex tests such as pesticide residues, aflatoxins, and contamination in milk and milk products.	EHNRI, Mol		■■■■	■■■■	■■■■		250,000
1.6	Adoption and effective implementation of codex codes of practices for controlling contaminants in milk and milk products.	MoA, EQSA, MOI, MoST		■■■■	■■■■			----
1.7	Review and consider the adoption and implementation of Codes of Practices / Standards as appropriate and devise a mechanism in the Food Act to include them.	MoA, EQSA, MOI, MoST				■■■■		-----
2	Promotion of consumer education	MoA, EQSA, MOI, MoH	■■■■	■■■■	■■■■	■■■■	■■■■	210,000
2.1	Develop education material on milk and milk products quality and safety issues.		■■■■					60,000

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
2.2	Undertake awareness campaigns on periodical basis through involvement of National Food Safety Council, MoA, relevant ministries, dairy processing units, NGOs, consumer organizations on general principals of personal hygiene and food hygiene. Undertake nationwide public information/education campaign to disseminate critical milk safety messages in multiple formats and languages targeted towards both local and national audiences through use of mass media tools.	MoA, MoI, EMDTI	■■■■	■■■■	■■■■	■■■■	■■■■	120,000
3.1	Carry out the management review of the scheduled activities at a predetermined frequency to monitor the progress of the planning and implementation of the milk and milk products safety programme.	EQSA, MoA, MoI, MoH	■■■■	■■■■	■■■■	■■■■	■■■■	----
4.1	Establish a central epidemiological surveillance unit with the capacity to address milk-borne diseases and provide it the necessary human and financial resources.	MoA		■■■■	■■■■			230,000
4.2	Identify the most appropriate approach to milk borne disease surveillance (laboratory- and epidemiologically-based) and outbreak investigation.	MoA	■■■■	■■■■				----
5	Development and organization of training programmes for milk handlers, inspectors and analysts in milk safety assessment	MoI, EMDTI, EQSA	■■■■	■■■■	■■■■	■■■■	■■■■	40,000
6.1	Undertake the inspection of registered dairy units at least once per year to assess compliance with requirements.	MoI, EQSA	■■■■	■■■■	■■■■	■■■■	■■■■	60,000
6.2	Mandate the dairy plants to provide information on the quantity of milk procured and processed, products manufactured, new product added every 6 months.	MoI, EMDTI	■■■■	■■■■	■■■■	■■■■	■■■■	----
	<b>TOTAL BUDGET</b>							<b>1,050,000</b>



### 6.3.3 CREDIT FACILITIES FOR PROCESSING

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Improved provision of credit to dairy processors.	Deliver effective financial solutions to dairy farmers through the development of area specific schemes, redesigning financial products and educating financial institutions and farmers on each other's industry.	
SITUATIONAL ANALYSIS		
<p>The involvement of banks in dairy processing finance is limited to large investors. These commercial banks are involved in credit service through government incentives for special programs and NGOs support. Effort is being made by Land O'Lakes to collaborate with three private commercial banks (Bank of Abyssinia, Awash International, and Dashen) that are Development Credit Authority (DCA) partners with USAID. Land O' Lakes provided training to the banks' lending officers to improve their understanding of the dairy sector, particularly dairy processing; its investment requirements, cash flow expectations, and potential returns on investment and covered 50% collateral for those interested borrowers constrained by lack of collateral. But, these banks are constrained by shortage of capital and loan able fund. Moreover, lengthy processes in obtaining investment loan proposals from banks and lack of trained manpower in banks to appraise such high-value proposals make credit provision to processors difficult.</p>		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Increase in credit flow to dairy processing sector (working capital and term loans) on year-on-year basis.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Credit Facilities to dairy processing units getting default on account of under capacity utilization due to lower procurement/lack of market.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Ensure satisfactory techno-economic appraisal;</li> <li>✓ Ensure to take adequate security cover to cover the risk;</li> <li>✓ Encourage financing under contract farming model only.</li> </ul>
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Prepare and implement the "Dairy Venture Capital Fund" scheme where the assistance under the scheme to be provided to the investors for setting up of dairy processing units;</li> <li>2. Create awareness among banks to accept processing plant and machinery as collateral;</li> <li>3. Mandate CBE/DBE to accord priority sector to finance to dairy processing sector.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>60,000</b>

## DETAILED ACTION PLAN 6.3.3: CREDIT FACILITIES FOR PROCESSING

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Mandate EMDTI to develop the “Dairy Venture Capital Fund” scheme and implement the scheme throughout Ethiopia including the financial outlay for the scheme.	EMDTI, MOI, MoA	■ ■ ■ ■					----
1.2	Publicize the scheme by widely circulating to the private investors to create the demand.	EMDTI, MOI, MoA						20,000
2	Create awareness among the banks to accept processing plant and machinery as collateral.	EMDTI, MOI, MoA						40,000
3	Mandate CBE/DBE to accord priority sector to finance to dairy processing sector.	EMDTI, MOI, MoA, CBE/DBE						----
3.1	Mandate CBE/DBE to issue guidelines in this regard and modify the guidelines in terms of increase in total borrowing limit and special interest subvention to dairy processing units.	EMDTI, MOI, MoA, CBE, DBE						-----
	<b>TOTAL BUDGET</b>							<b>60,000</b>

### 6.3.4 CAPACITY BUILDING AT PROCESSING LEVEL

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Strengthen the capacity of students and professionals to improve the management and efficiency in the dairy processing sector.	Strengthen the education programmes and entrepreneurship development programmes important to the dairy processing sector.	
SITUATIONAL ANALYSIS		
In Ethiopia, the capacity gap in dairy processing still remains a critical issue in terms of human resources and infrastructure. There is a need to strengthen the existing capacity building initiatives and foster institutional learning in the dairy processing sector in order to improve the efficiency and management ability of dairy sector professionals.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
✓ Increase in enrolment of professionals and students for training and entrepreneurship development programmes in dairy processing sector.	✓ Less enrolment of students and professionals due to non-lucrative career / viable investment options in this area.	✓ Orientation of students and professionals on diversified opportunities in this domain.
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Upgrading of Dairy Processing Programmes:</li> <li>2. Entrepreneurship Development Programme (EDP) for prospective entrepreneurs:</li> <li>3. Creation of Infrastructure Facilities in Research/Learning Institutions.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>990,000</b>

## DETAILED ACTION PLAN 6.3.4: CAPACITY BUILDING AT PROCESSING LEVEL

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Constitute a working group comprising of representatives from dairy industry and dairy educational institutions (EMDTI, agriculture universities, research centers) to develop a model syllabus and detailed curriculum.	EMDTI, MOI, MoA	■ ■ ■ ■					----
1.2	Upgrade the existing courses in dairy engineering, dairy technology, dairy chemistry, dairy microbiology and quality assurance (both in theory and practical aspects).	Universities	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	200,000
1.3	Establish the state-of-the art experimental learning centre for dairy processing course with the financial assistance from MoA at EMDTI.	Universities		■ ■ ■ ■				250,000
1.4	Appoint the management of the learning center along with recruitment of core workforce and faculty members.	Universities		■ ■ ■ ■				---
1.5	Introduce a one-year course on Dairy Plant Operations and Maintenance Management as a sandwich programme during the bachelor's course.	Universities, EMDTI		■ ■ ■ ■	■ ■ ■ ■			-----
1.6	Conduct the interactive sessions with eminent managers from industry, statutory bodies, suppliers and professional associations.	Universities	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	40,000
1.7	Mandate experimental learning center to develop the modules for vocational courses in dairy processing and operations management for non-dairy professionals.	Universities	■ ■ ■ ■	■ ■ ■ ■				---
2.1	Mandate MoE to provide financial assistance for conduct of EDPs in dairy processing through R & D centers, universities and NGOs.	EMDTI, MoA, MoI		■ ■ ■ ■				---
2.2	Document the dairy processing opportunities in the area. (It is expected that in selected regions some techno-economic survey indicating availability of raw material, human, infrastructural facilities, potential demand of milk and milk products have already been conducted). Involve banks if need be to substantiate the potentiality of developing a particular area.	EMDTI, MoA, MoI		■ ■ ■ ■	■ ■ ■ ■			80,000
2.3	Collaborate with local bank and other promotional organizations to prepare project profile based on such documents.	EMDTI, MoA, MoI	■ ■ ■ ■	■ ■ ■ ■				120,000
2.4	Organize a campaign in the area in order to create awareness about the entrepreneurial opportunities and the role and support of various agencies. Prepare pamphlets to be distributed through various channels, educational institution and other promotional organizations. Provide announcement in mass media tools locally available for giving wide coverage to the programme and attract potential people to the programme.	EMDTI, MoA, MoI, MoE						60,000

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
2.5	Develop the framework for EDP programmes to enable trainees to establish commercially viable enterprises in dairy processing sector by providing basic knowledge of project formulation and management including technology and marketing, motivating the trainees and instilling confidence in them, educating on the opportunities and financial assistance available and providing necessary support to enable them to receive credit from banks and other support services.	EMDTI, MoA, MoI, MOE	■■■■	■■■■				120,000
2.6	Conduct the EDPs for 6 weeks depending upon the contents with a follow-up phase of 12 months.	EMDTI, MoA, MoI, MoE			■■■			60,000
3.1	Develop and implement scheme for providing financial assistance to academic institutions like government organizations, universities, research centers for creation of infrastructure facilities like equipments, laboratory, pilot plants, library and books and journals for running post graduate/degree/doctorate programmes in dairy processing sector.	EMDTI, MoA, MoI			■■■■	■■■■	■■■■	60,000
	<b>TOTAL BUDGET</b>							<b>990, 000</b>

### 6.4.1 QUALITY AND SAFETY IN DAIRY EXPORTS

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Ensure safety and quality of milk and milk products for exports.	Implement proper milk quality and safety systems and procedures.	
SITUATIONAL ANALYSIS		
<p>There is no comprehensive food safety policy in Ethiopia. The food control activities are scattered among various Ministries and appear to lack co-ordination. Inspection remains random and a clearly defined inspection and implementation body, with the responsibility and authority to implement food related safety measures from farm to fork is absent. The food safety system of Ethiopia lacks a structured food borne disease and contaminant surveillance and risk assessment system. Low capacity in terms of infrastructure development and HRD are some of the constraints hindering the development of robust food quality and safety systems and procedures. The requisite infrastructure for addressing Sanitary and Phyto-Sanitary (SPS) requirements in Ethiopia are much below the capacity required.</p>		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Improvement in hygienic quality, sensory quality, nutritional quality and technological quality of market milk and milk products meant for exports.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Reluctance from dairy processors to adopt the food quality and safety systems.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Mandatory enforcement of the quality and safety norms.</li> </ul>
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Finalization of Export Act (Quality Control and Inspection Act) for milk and milk products intended for export;</li> <li>2. Set up dedicated Export Inspection Cell (EIC) Council in EQSA as the official certification body for mandatory pre-shipment export certification for dairy products;</li> <li>3. Development and organization of training programmes for exporters in milk safety assessment.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>690,000</b>

## DETAILED ACTION PLAN 6.4.1: QUALITY AND SAFETY IN DAIRY EXPORTS

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Develop the framework for the rules under this Act including Good Hygienic Practices (GHP) and Good Manufacturing Practices (GMP) to be implemented by the dairy businesses intending to export their products, a residue monitoring plan for chemical contaminants in milk.	EMDTI, Mol, EQSA	■ ■ ■ ■					100,000
2.1	Constitute the panel of EIC comprising of representatives from various departments such as ESA, MoARD and Food, Medicine and Health Care Administration and Control Authority of Ethiopia (FMHACA). Develop the guidelines for approval of the processing units by EIC including submission of application along with HACCP manual by the processor to EIC, assessment of the HACCP manual and assessment by the panel of EIC.	EMDTI, Mol, EQSA	■ ■ ■ ■					----
2.2	Undertake monitoring visits to verify records, process controls, sanitation and hygiene, drawing samples of raw material, processed/finished products, water and swabs for independent testing for microbiological parameters. Communicate the same in Corrective Action Report (CAR) format to the processor to correct the discrepancies in the specified time frame.	EMDTI, Mol, EQSA		■ ■ ■ ■				45,000
2.3	Undertake supervisory visit once in every three months to check the compliance with the requirements of the system as well as quality of monitoring.	EMDTI, Mol, EQSA		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	45,000
2.4	Undertake the corporate audit involving the examination of records of processor maintained by EICs to check compliance with the executive instructions.	EQSA					■ ■ ■ ■	60,000
2.5	Develop a complaint redressal mechanism to address the complaints from an importer or government of an importing agency.					■ ■ ■ ■		----
2.6	Upgrade the capacities of laboratories of the Ethiopian Health and Nutrition Research Institute (EHNRI), Microbiology Public Health Laboratory and the Public Health Chemistry Laboratory supported by six regional testing laboratories, chemical and microbiological laboratories of ESA so that they are able to perform complex tests such as pesticide residues, aflatoxins, and contamination in milk and milk products.							210,000
3.1	Conduct the training based for big dairy processors/retailers based on GHP/HACCP/GLOBAL GAP principles.	EQSA	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	70,000
3.2	Organize the national seminars to raise awareness of the importance of milk safety for exporters.	EQSA	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			40,000
3.3	Conduct the training programmes on introduction of codes of good practices, food/dairy safety systems (such as HACCP) and principles of auditing and verification to the inspectors/analysts.	EQSA			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	40,000
3.4	Organize the training of inspectors/analysts on sampling of milk and milk products and handling and preservation of the samples.	EQSA		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		40,000
3.5	Organize the training of food/dairy control laboratory personnel in principles of laboratory management and in microbiological, chemical and physical analyses of dairy products.	EQSA	■ ■ ■ ■	■ ■ ■ ■				40,000
	<b>TOTAL BUDGET</b>							<b>690,000</b>

### 6.4.2 ENHANCING TRADE OF DAIRY PRODUCTS

STRATEGIC OBJECTIVE	ENABLING OBJECTIVE	
Enhance domestic and cross-border trade in dairy products.	Create the conducive and enabling legal, regulatory and institutional environment for improved market access.	
SITUATIONAL ANALYSIS		
Ethiopia is not known for export of dairy products. The volume and value of dairy product exports to foreign markets is very low. With insignificant quantity, milk and butter were exported to few countries, particularly to Djibouti, Somalia and Ethiopian Diaspora abroad. On the other hand, the import of dairy products by Ethiopia is significant over the period of 1999 to 2008. No separate policy and strategy has been developed to focus on the trade policy of the country. The trade instruments of the country are embedded within the various policy and strategy documents, which include: rural development policies and strategies; industrial development policy; and the investment policy. Cumbersome export/import procedures, lack of comprehensive port/rail infrastructure, poor institutional structure, lack of defined safety requirements for dairy products and lack of regional policy on non-tariff charges on dairy products are some of the constraints hampering the growth of dairy trade in Ethiopia.		
KEY PERFORMANCE INDICATORS	KEY RISKS/POTENTIAL BARRIERS	MITIGATION PLANS
<ul style="list-style-type: none"> <li>✓ Increase in intra-regional exports of dairy products;</li> <li>✓ Improved market access to Middle-East markets;</li> <li>✓ Reduced Dependence on importation of milk.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Milk deficit situation and under-developed dairy market.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Undertake measures to improve the milk production;</li> <li>✓ Develop a robust dairy quality control and safety management systems intended for dairy products exports.</li> </ul>
ACTION PLANS		
<ol style="list-style-type: none"> <li>1. Reduction of trade costs;</li> <li>2. Improvement of support services;</li> <li>3. Strengthening institutional capacity of trade agencies;</li> <li>4. Imposing import controls and restrictions and streamlining tariff and non-tariff charges;</li> <li>5. Development of a regional dairy trade development policy.</li> </ol>		
<b>TOTAL BUDGET (USD)</b>		<b>470,000</b>



## DETAILED ACTION PLAN 6.4.2: ENHANCING TRADE OF DAIRY PRODUCTS

ACTIVITY/SUB-ACTIVITY NO	ACTIVITY DESCRIPTION	IMPLEMENTING AGENCY/IES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	BUDGET (US \$)
1.1	Reduce the administrative burden of export and import procedures through streamlining and simplification of documentation and procedures both in terms of number and time. The one window export documentation for meat export certification can be used as an example.	EMDTI	■ ■ ■ ■	■ ■ ■ ■				60,000
1.2	Develop road-rail container terminal at Addis Ababa with private sector participation.	EMDTI, MOA, MOI						
2.1	Improve transportation and border infrastructure connections with Kenya and Sudan.	EMDTI, MOA, MOI, ERA	■ ■ ■ ■					----
2.2	Participate in the Tripartite Free Trade Area (TFTA), which combines the members of the Common Market of Eastern and Southern Africa (COMESA), the East African Community (EAC) and the Southern African Development Community (SADC) for facilitating the movement of persons, joint implementation of regional infrastructure projects and other forms of regional co-operation. Take such measures as implementation of EBA and COMESA agreements to access the EU market and the COMESA FTA as well as other markets.	EMDTI, MOA, MOI, MoFA	■ ■ ■ ■	■ ■ ■ ■				110,000
3.1	Recruit and train staff in MoT, MoFA and Chambers of Commerce in the areas of design of dairy trade information and analysis.	EMDTI, MOA, MOI	■ ■ ■ ■	■ ■ ■ ■				40,000
3.2	Organize within MoT and Chambers of Commerce trade-related information from sources such as COMESA, WTO and trade promotion organizations through improved internet access (websites and databases).	EMDTI, MOA, MOI	■ ■ ■ ■	■ ■ ■ ■				120,000
3.3	Strengthen the main export and trade organizations to make them effective participants in quality improvement and international trade discussions on SPS.	EMDTI, MOA, MOI	■ ■ ■ ■					60,000
4.1	Develop a regional mechanism for detecting cases of subsidized and dumped milk products to address the reasons behind the protective system for import authorization.	EMDTI, MOA, MOI, MOFA	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			80,000
4.2	Undertake reduction of duty on intra-regionally sourced dairy products to zero amongst COMESA countries.	EMDTI, MOA, MOI, MOFA		■ ■ ■ ■	■ ■ ■ ■			----
4.4	Develop a harmonized schedule of non-tariff charges allowable under WTO General Agreement on Trade and Tariffs (GATT)	EMDTI, MOA, MOI, MOFA, MOT		■ ■ ■ ■	■ ■ ■ ■			----
<b>TOTAL BUDGET</b>								<b>470,000</b>

## ANNEXURES

## 1. Overview of the main dairy programmes of major countries

United States							
Commodity	Domestic Support				Trade Policies		
	Income Support		Price Support	Other	Market Access		Export Competition
	Direct and countercyclical payments	Disaster Aid	Government Purchases	Marketing orders	Import quotas	Tariffs	Export Subsidies
Milk	x	x		x			
Butter			x		x	x	x
Cheese			x		x	x	x
Nonfat dry milk			x		x	x	x
Whole Dry milk					x	x	
Other dairy products					x	x	
European Union							
Commodity	Domestic Support				Trade Policies		
	Price Support			Others	Market Access		Export Competition
	Supply Management	Intervention	Other Storage Aid	Consumer Subsidies	Tariffs	Import Quotas	Export Subsidies
Milk	x			x			
Butter		x	x	x	x	x	x
Cheese			x		x	x	x
Nonfat dry milk		x	x	x	x	x	x
Whole Dry milk					x	x	x
Other dairy products					x	x	x
Canada							
Commodity	Domestic Support			Trade Policies			
	Import Support	Price Support		Market Access		Export Competition	
	Disaster Aid	Supply Management	Support Price	Tariffs	Import Quotas (TRQs)	Export Subsidies	
Milk	x	x	x				
Butter			x	x	x	x	
Cheese				x	x	x	
Nonfat dry milk			x	x	x	x	
Whole Dry milk				x	x		
Other dairy products				x	x	x	
Australia/New Zealand							
Commodity	Domestic Support		Trade Policies				
	Import Support		Market access				
	Producer payments	Tariffs	Import Quotas (TRQs)				
Milk							
Butter		x	x				
Cheese		x	x				
Nonfat dry milk							
Whole Dry milk							
Other dairy products							
Japan							
Commodity	Domestic Support			Trade Policies			
	Import Support	Price Support	Other	Market Access			
	Producer payments	Production Quotas	Consumer subsidies	Tariffs	Import Quotas (TRQs)		
Milk	x1	x1	x				
Butter				x	x		
Cheese				x	x		
Nonfat dry milk				x	x		
Whole Dry milk				x	x		
Other dairy products							

## 2. Overview of roles and limitations of the different dairy value chain actors in Ethiopia

VALUE CHAIN ACTORS	SCOPE OF ACTIVITIES	LIMITATIONS	SUGGESTION ON REMOVING LIMITATIONS
<b>1. Input, Feed and Drug Providers</b>			
▪ Dairy equipment suppliers	Multiply /purchase and distribute inputs/ equipments	Seasonality of demand for inputs and animal health service;	
▪ Private feed processors	Concentrate feed processing and supply	Capital limitations; VAT charged while milk is sold VAT free	Arrange credit facilities; make feed sale free of VAT charge;
▪ Veterinary drug suppliers	Supply veterinary drug	Illegal trade and ineffective control mechanism; shortage of veterinary drug	Improve supply of veterinary drugs
<b>2. Dairy Producers</b>			
▪ Rural smallholder producers	Produces raw milk and supply to coops and processors	Shortage of feed and appropriate breed, and low productivity per cow	Improve access to improved breeds, AI and Veterinary service
▪ Peri-urban & urban producers	Produce raw milk and supply to coops or dairy processing plants	High cost of feed leads to high cost of milk production; capital shortage	Encourage investors to feed processing; create access to credit;
▪ Private commercial farms	Produce raw milk, butter and cheese	High cost of feed and shortage of vet drugs	Increase production and supply of drugs
<b>3. Dairy Processors</b>			
▪ Private processors	Milk collection, processing and marketing,	Old machineries (Lame dairy) Low market demand for processed dairy products	Rehabilitation with high capacity machineries; Aggressive promotion on Radio, TV& Exhibitions;
	Produce new type of processed products	Lack of affordable package of processing and packaging technologies,	Encourage locally manufactured milk processing technologies and support services;
▪ Dairy cooperatives/ Unions	Collective processing and marketing service,	Lack of access to credit; Limited processing practice; Lack of facilities (refrigerators, cold transport, and equipment); Marketing problems	Arrange credit for processors; Provision skill training on processing techniques; Support coops to fulfil appropriate with logistics
<b>4. Dairy Marketers</b>			
▪ Individual trader collectors	Collect raw milk and supply to consumers or processors	Lack credit facilities	Support to access financial credit for milk marketing
▪ Farmer producer groups	Collect milk from members and supply to coops or processors	Lack of logistics and credit facilities	Support to access credit and logistic facilities by linking to coops

▪ Dairy cooperatives	Collective marketing and facilitation of access to external supports	Poor organizational quality and lack of integration; inadequate market access; and lack of credit	Support in using proper packaging, quality and safety measures; create linkage with processors and consumers; facilitate credit access
▪ Private dairy processors	Supply processed and packed dairy products to retailers and consumers	Market demand for processed products particularly during fasting season; Small and Micro processors lack cold chain and logistic facilities	Aggressive promotion through media and exhibitions; Support processors to access processing facilities and credit
▪ Retailers, shops and supermarkets	Retail processed and packed dairy products to consumers	Lack of credit access and cold storage facilities	Arrange access to credit to market dairy products and be able to invest in cold storage facilities
<b>5. Support Service Providers</b>			
<b>5.1 Government Institutions</b>			
▪ Federal & regional agr. extension and veterinary service providers	Technology demonstration, linkage facilitation, and training (AI service, feeding, and health management techniques); Provide health and AI services	Shortage of liquid nitrogen plant; Shortage of veterinary drugs; Turnover of trained technicians	Establish additional liquid nitrogen plants at strategic places; Strengthen regional and national AI training centres; train community AI technicians
▪ Federal & regional cooperative agencies	Dairy cooperative promotion and facilitating their legal organization; Provide technical assistance to dairy cooperative to enhance their managerial capacity & efficiency; Facilitation of credit and market for cooperatives	Budget scarcity for cooperatives promotion; Lack of skill capacity to assist cooperatives; Poor coordination among relevant government organizations	Sufficient budget and logistic allocation from government; Continuous training and education to cooperative managers and government experts by government and development partners;
▪ Micro & small enterprise development offices	Promoting urban dairy group for income generation	Skill capacity limitation to provide technical support; Budget and personnel shortage	Provide skill training to service providing experts; Allocate sufficient budget so as to fulfil required materials and for recruiting trained personnel
▪ Agricultural Research Institutions	Breed, forage and milk processing technology development and demonstration; Straw treatment and on farm demonstration of crossbred heifer; Breed, forage and milk processing technology demonstration; Animal health research	Less focus on non-technical impediment to dairy sector - market, innovation, organization and financing service delivery; Limited means and ineffective methods to disseminate research results in organized, useful & easily accessible ways	Give priority to dairy breed, feed, and milk processing technology research; Design and adopt efficient and effective method of communicating research results to users; Establish national dairy forums

▪ Rural finance institutions	Rural financial services for urban and rural dairy producers and producer groups	Often less suitable credit service for rural smallholder dairy subsector	Government and development partners should create credit access for dairy value chain actors
▪ ILRI (International Livestock Research Institute)	Dairy and forage research, pro-poor livestock policy and development	Limited area coverage	Work in partnership with public institutions so as replicate experiences gained
<b>5.2 NGOs/ Projects</b>			
▪ SNV Ethiopia /BOAM	Capacity development along value chain (strengthening sector associations, technology provision, value chain financing, strengthening private sector & producers groups; market intelligence, and service provider strengthening);	Mainly availability of budget; Capacity gaps: quality of service, personnel, and manpower; Limited efforts and/ or ability for scaling up successful experiences	Resource mobilization; Partnership with stakeholders to share experiences replicate them
▪ Land O'Lakes Ethiopia	Private sector development; Training on dairy cooperative organization, leadership & management; Assist actors in business plan preparation and linking them to financial institutions & dairy equipment suppliers; Collaborate in dairy policy and strategy development;	Limited efforts and/ or ability for scaling up/out successful experiences  Low adoption of leadership, management & record keeping;	Dairy cooperatives should employ skilled manpower; Capacity building through training;
<b>5.3 Sectoral Associations</b>			
▪ Ethiopian milk producers & processors association	Create market linkage for members; Identify challenges and bring to government attention tackle them; Support members in getting feed; Facilitate training for members	No dairy policy in place; Financial capacity limitation; based on members contribution; Lack of transport means for staff of association	Dairy policy should be in place; Donors and NGOs should support the association in finance & facilities in addition to members contribution
▪ Ethiopian animal feed industries association	Identify feed supply challenges and bring to government attention for solution; Provide technical assistance and training to members; Provide members with market information.	Multiple taxation imposed at different level of animal feed processing including feed buyers (VAT); Few members, only 25 active members registered; Limited knowledge of members on legal and policy issues and quality standards.	VAT be revised and exempted for feed processors just as dairy products are VAT exempted; Encourage investors to feed processing business; Provide training to members on policy, legal and quality standard issues.

### 3. Case Studies from Best Practice Countries

#### A. QUALITY AND SAFETY STANDARDS OF MILK AND MILK PRODUCTS

##### I. India

In India, there are systems in place to ensure production, import and export of quality and safe milk and milk products. The overview of them is provided below:

##### A. Food Standards

- The main Indian Food Laws are the **Prevention of Food Adulteration (PFA) Act and Rules**. The PFA standards, which are mandatory, prescribe minimum compositional standards and various other provisions to prevent adulteration of foods and also specify maximum levels for several chemical contaminants. The Central Committee for Food Standards (CCFS) is the expert body, which recommends food standards. The PFA standards, which are mandatory, prescribe minimum compositional standards, standard for levels of residues of chemical contaminants and various other provisions. The PFA Rules also mandates application of the standards of the Bureau of Indian Standards (BIS) for milk powders, evaporated and condensed milks;
- Another important Food Law related to quality is **Agricultural Produce (Grading and Marking) Act 1937 (as amended in 1986)**. Better known as “AGMARK”, the Act includes ghee, butter and fat spreads among dairy products for grading under the scheme. The quality parameters for products cover mainly compositional characteristics and adulteration aspects. No microbiological standards are prescribed for the dairy products covered under Act. The standards are enforced by the Directorate of Marketing and Inspection, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India. A voluntary product certification scheme under the Act allows the licensees to use the AGMARK logo on their products. The licensees are required to follow a defined scheme of testing and inspection, and manufacture product that conform to the appropriate AGMARK standards. The results of analyses are to be shared with the AGMARK authorities. In addition, the licensees are required to send sample to AGMRAK laboratories at a predetermined frequency;
- For infant foods, the governing Act is *Infant Milk Substitute, Feeding Bottles and Infant Foods (Regulation of production, supply and distribution) Act 1992-Rules, 1993*. An important provision of these Rules is that Infant Foods and feeding bottles cannot be advertised;
- For dairy establishments, mandatory provisions are prescribed in the Central Government Order called the *Milk and Milk Products Order, 1992* (renamed as Milk and Milk Product Regulations, 2009) promulgated under the Essential Commodities

Act, 1955. The order lays great emphasis on the hygienic production and processing of products;

- **Bureau of Indian Standards (BIS)** has formulated and revised standards and guidelines for various dairy products and processes. The BIS standards are in general voluntary. However, standards for milk powders, evaporated and condensed milks are mandatory as per the provisions of PFA rules. The BIS also operates a product certification scheme that allows the licensees to use the ISI mark on their product packages. The licensees are required to follow a defined scheme of testing and inspection, and manufacture product that conform to the appropriate BIS standards;
- The specific requirements to be complied by food plants for exports are provided in the *Export (Quality Control and Inspection) Act, 1963*. Registration of food manufacturing plants with the Export Inspection Council of India (EIC) has been made mandatory for undertaking the exports. The Rules under this Act provide for Good Hygienic Practices and Good Manufacturing practices to be implemented by the dairy businesses intending to export their products. It also operates a residue monitoring plan for chemical contaminants in milk. The relevant national/international standards for chemical contaminants and adulterants should be met for raw milk collected for further processing;
- Provisions of the *Livestock Importation Act, 1898, amended 1953*, are to be complied within importing livestock products. To prevent entry of any diseases through import of livestock and livestock products, four Animal Quarantine and Certification Stations (AQCSs) have been functioning for quarantine, health check and certification of animals for export/import;
- In India, some safety aspects related to genetically modified (GM) foods are covered under the *Environmental Protection Act*. The Genetic Engineering Approval Committee and the Review Committee on Genetic Manipulation are the agencies to examine and approve matters related to GM foods;
- Legislation is *Atomic Energy (Control of Irradiation of Food) Rules, 1996*, which regulates the production of irradiated foods;
- *Standards of Weights and Measures (Packaged Commodities) Rules, 1977* aim to ensure that the basic rights of consumers regarding vital information about the nature of the commodity, the name and address of the manufacturer, the net quantity, date of manufacture and maximum sale price are provided on the label. Importers of packaged food products must adhere to these rules;
- Labelling of Milk and Milk Products – Any milk or milk product that is packed should have a label. Labelling of a packed product is mandatory. Its violation leads to punishment. The label should reveal name of the product, nature of the product, ingredients – in descending order of their weight/volume in the product, colors or additives with name or INS numbers, batch/lot number/code, date of manufacturing,

date of expiry, shelf life, methods of use, precautions to be taken in its use, storage conditions, any restrictions on its use, vegetarian or non-vegetarian logo, size of the letters and logo, nutritional claims, manufacturer's address, quantity (net weight or volume as per the Weights & Measures Rules), Maximum Retail Price (MRP) (inclusive of all taxes). The type of matter to be printed on the principal display model is also specified. If the product contains flavors/colors, a declaration has to be made on the label. Food additives have been classified and their class has to be mentioned along with their name or number. Bar code is being used by many companies;

- Industrial License – No license is required for setting up a dairy plant in India. Only a Memorandum has to be submitted to the Secretariat for Industrial Approvals (SIA) and an acknowledgement is to be obtained. However, a certificate of registration is required under MMPO, 1992;
- Foreign Investment – Foreign investment in dairying requires prior approval from the Secretariat of Industrial Approvals, Ministry of Industry, as dairying has not been included in the list of High Priority Industries. Automatic approval will be given upto 51 % foreign investment in High Priority Industries. In case of other industries, proposals will be cleared on case-to-case basis. The Government may allow 51 % without enforcing the old limit of 40 % applicable under Foreign Exchange Regulations Act at its discretion.

## B. Testing Facilities

- There are noticeable analytical facilities in the country. PFA has over 80 laboratories; BIS has 5 laboratories and has also recognized some private ones; Directorate of Marketing and Inspection (Agmark) has over 20 well-equipped food laboratories; Council for Scientific and Industrial Research (CSIR) has 12 laboratories, some of which are equipped with modern equipment; EIC has some laboratories equipped with modern equipment as well as smaller ones at ports; Agricultural Produce and Export Development Authority (APEDA) has recognized several laboratories in private sector. Additionally, research institutions have their own facilities.

## C. Assurance Programmes in Place

- **Animal Health** – An important factor in producing safe milk and milk products is good animal health. The Sanitary and Phytosanitary (SPS) Agreement includes a provision that the areas from where the export is being affected are pest- and disease-free, or are of low prevalence of pest and disease. One of the major thrusts of the Government has been on animal health with special emphasis on creation of disease free zones and control of Foot and Mouth Disease. Further, almost all the animal vaccines are produced in India. There have been several government programmes to control animal disease. The whole country is at present free from Rinderpest according to the Office Internationale des Epizooties (OIE). The dairy industry is also



providing animal health services. Most dairy cooperatives provide such services, regular and/or on call, to their member producers;

- **Quality assurance in processing plants** – In Indian Food Laws, application of HACCP (Hazard Analysis and Critical Control Point) in a food plant is not mandatory so far. The Ministry of Health is implementing a programme “Food safety management through Good Hygienic Practices (GHP), Good Manufacturing Practices (GMP) and HACCP” to sensitize the food industry. HACCP is a management tool that provides a structured and scientific approach to the control of identified hazards. HACCP has international recognition as an effective means of controlling food safety hazards and is endorsed as such by the Food and Agriculture Organization (FAO)/World Health Organization (WHO) Codex Alimentarius Commission;
- **Quality Council of India** has been established as a joint initiative of the Government of India and the Indian Industry to function as an accreditation infrastructure for certification bodies, management system auditors, consultants and testing laboratories, to provide information on quality and to spread quality movement in India. The **National Accreditation Board of Certification Bodies (NABCB)** undertakes assessment and accreditation of Certification Bodies in line with international standards and guidelines. The Board has launched the accreditation schemes for different Management Systems including Food Safety Management System;
- **National Accreditation Board for Testing and Calibration Laboratories (NABL)** has been established with the objective to provide Government, Industry Associations and Industry in general with a scheme for third-party assessment of the quality and technical competence of testing and calibration laboratories;
- **ISO 22000-2005 Food Safety Management System** is backed by international consensus, harmonizes the requirements for systematically managing safety in food supply chains and offers a unique solution for good practice worldwide. In addition, food safety management systems that conform to ISO 22000 can be certified – which answers the growing demand in the food sector for the certification of suppliers;
- **The Food Safety and Standards Bill 2005** seeks to set up a single regulator that will put in place food standards and regulate manufacturing, import, processing, distribution and sale of food products. Currently, food manufacturing units have to deal with over eight Government departments controlled by various Acts and control orders issued under Essential Commodities Act. There is so much contradiction and overlapping in these laws and the infrastructure remains poor. The integrated law aims to end all this. The law aims at a better understanding of the intricacies of the food industry. The law envisages tribunals at the district, state and national levels. These tribunals will deal with cases based on current law. The Food Bill not only incorporates the salient provisions of the Prevention of Food Adulteration (PFA) Act, but is also based on international legislations and Codex Alimentarius Commission (related to food safety norms). The proposed body will regulate the limits on the

usage of food additives, crop contaminants, pesticide residues, heavy metals, processing aids, mycotoxins, antibiotics and pharmacological active substances. It will formulate mechanisms and guidelines for the accreditation of bodies engaged in the certification of a food safety management system for the food business as well as for accreditation of food testing laboratories. It will also set up food labeling standards, including claims on health, nutrition and special dietary uses. The Bill has imposed safeguards on import of food products. No person shall be allowed to import unsafe, misbranded or sub-standard food and importing would require a license;

- Dairy products are covered under the **Compulsory Quality Control, Inspection and Monitoring Notification** that lays down the standards for exports including the sanitary, hygiene and other food safety requirements. Recognition is also given to the Codex Alimentarius Commission (CAC) standards, the national standards of the importing countries. The notification also specifies the type of quality control and inspection as per Export of Milk Products (Quality Control, Inspection and Monitoring) Rules, 2000 applicable to milk products prior to the export. The Government of India set up the Export Inspection Council of India (EIC) as the official certification body. For dairy products, the certification system involves approval of milk processing plants, followed by periodic surveillance by the five Export Inspection Agencies (EIAs) in the country. Some requirements which a processing unit needs to comply with before exporting milk products are listed below (almost similar to the requirements for domestic market):
  - Any statutory restriction imposed by any State /Central Government with respect to commercial/environmental /conservation measures from time to time;
  - Milk Products should have been manufactured from milk of healthy dairy animals. Further, milk from animals which have been treated with antibiotics or other veterinary drugs which can be transferred to milk shall not be brought to the collection center unless the retention period of drug following such treatment has been inspected;
  - The milk products should contain only the permissible food additives/processing inputs/ingredients that are fit for human consumption;
  - Milk products should have been treated and prepared in an approved plant;
  - Processing and/or manufacturing should have been carried out under the hygienic conditions;
  - The products should have been stored at such temperatures as directed by the manufacturer to ensure their durability;
  - The period for which the milk products are fit for human consumption and storage shall be indicated by the processor on the label;

- Results of various checks and tests shall be recorded and kept for a period of two years for presentation to the competent authority;
- Residues of substances having a pharmacological or hormonal action and antibiotics, pesticides, detergents and other substances should not be present in milk at levels which might alter the sensory characteristics of milk products or make their consumption dangerous or harmful to health;
- If the milk products examined show traces of residues in excess of the permitted levels, they must not be allowed either for the manufacture of foodstuffs or for direct human consumption; and,
- Tests for residues must be carried out in accordance with nationally/internationally recognized methods.

## II. Australia

### A. Development of Dairy Food Policy

The Australian New Zealand Food Regulation Ministerial Council consisting of Health and Agriculture Ministers from the states and territories and the Governments of Australia and New Zealand sets policies for food production in Australia. Food Standards Australia and New Zealand (FSANZ) use these policies as a framework to develop food standards. The Australian Quarantine and Inspection Service (AQIS) provide certification for exported dairy products and helps facilitate market access arrangements. AQIS is also responsible for the surveillance of animals, feeds and foods imported into Australia. International standards and codes of practice derived from the Codex Alimentarius Commission, World Animal Health Organisation (OIE), World Trade Organisation (WTO) and World Customs Organisation (WCO) provide guidelines for Australian food regulation.

### B. Development of Food Standards

Food standards covering all foods produced domestically or imported for sale in Australia and New Zealand are developed by FSANZ in conjunction with stakeholders such as consumers, government agencies and industry groups. The Standards are published in the Australian and New Zealand Food Standards Code (FSC). The FSC includes the Primary Production and Processing Standard for Dairy Products.

AQIS regulates the export of dairy products to meet importing country requirements through the Export Orders. Wherever possible the Export Orders are harmonized with the FSC.

The Australian Pesticide and Veterinary Medicines Authority (APVMA) is responsible for a national system that evaluates and registers agricultural and veterinary chemicals and specifies the conditions of use.

The Animal Health Committee (AHC) develops national approaches for the control of animal diseases the implementation supported by Animal Health Australia (AHA). The National Livestock Identification System (NLIS) provides lifetime traceability for animals.

State Environmental Protection Authorities (EPAs) establish and administer regulations and codes of practice for the protection of the environment including recycling of materials and water.

### **C. Enforcement and verification**

Food standards are enforced in the Australian dairy industry predominately by State Dairy Food Authorities (SDFA) in conjunction with State Health Departments (SDoHs) and local government.

AQIS has arrangements in place with SDFAs for the enforcement of standards for exported product. AQIS may inspect or check test imported foods for compliance with Australian standards.

All dairy businesses (farm and factory) must be licensed. Individual Food Safety Programs (FSP) for farms and factories are validated by SDFAs before licences are granted and compliance monitored through regular audits. An annual verification program is conducted by SDFAs and AQIS.

State Departments of Primary Industries/Agriculture (SDPIs) enforce regulations for use of chemicals on farms, animal welfare, control of animal disease and biosecurity including traceability.

The relevant State Veterinary Practitioners Registration Board registers veterinarians for clinical practice.

State Environmental Protection Agencies (EPAs) monitor the environment including water and air supplies for conformance with regulatory requirements.

### **D. Surveillance**

A range of industry and regulatory agencies monitor the safety and quality of milk and dairy products through the supply chain. These include dairy companies, regulatory groups such as the Australian New Zealand Dairy Authorities Committee (ANZDAC), federal and state regulatory agencies, SDFAs, SDPIs and EPAs. The Australian Milk Residue Analysis (AMRA) Survey is an important measure in monitoring the safety of milk. State Departments of Health (SDHs) monitor the safety of food at retail level.

The National Dairy Food Safety Regulatory Framework is an integrated system involving federal and state regulatory agencies, dairy farmers, dairy companies and Dairy Australia. International Codes and Standards provide a basis for this framework. As part of this framework, industry quality assurance programs require all sectors of the supply chain to

take responsibility for food safety. Potential risks are monitored and the industry regularly updated.

### E. Pre-Farm Regulation

Potential risks to food safety and product integrity from initial inputs such as feed, livestock, fertilizers, water and chemicals are assessed by government and national industry agencies on an ongoing basis. The Australian Pesticide and Veterinary Medicines Authority (APVMA) determines the types of chemicals that can be used for the production of stock feed and veterinary chemicals used for treatment of animals plus the recommended withholding periods after treatment. Vendor declarations providing background information must be supplied with stock feed consignments and animals sourced from on off farm.

Stock feed and grains industries have HACCP based accredited QA programs to ensure the feed is safe for use by dairy animals.

Electronic ear tags used to identify all animals on the farm provide a key tool for traceability of animals from birth to death or slaughter. The National Livestock Identification System (NLIS) provides the framework for the identification of Australian livestock.

State legislation ensures that fertilizers are appropriately labeled and maximum limits are set for elements that may pose a risk to agriculture.

Farm Food Safety programs must ensure water supplies are suitable to protect animal health and prevent contamination of milk.

**Environmental Protection Authorities (EPAs)** regulate the disposal of farm effluent on farm.

### F. Farm Regulation

All Australian dairy farms are required to have documented food safety programs (FSP). **State Dairy Food Authorities** (SDFAs) approve the FSP before a dairy farm license is granted. Approved auditors conduct regular audits of the farm FSP.

Core elements of the FSP include:

- Control of contaminants – physical, chemical and microbiological;
- Dairy milking premises;
- Hygienic milking;
- Water supply and quality;
- Cleaning and sanitizing;
- Traceability and records;

- Personnel competency.

All animals are individually identified from birth to death. Farmers actively monitor the health and well being of animals with the assistance of registered veterinarians. Vendor declarations are required for animals and stock feed purchased from external sources. Risks from agricultural, veterinary and cleaning chemicals are minimized by using only chemicals registered by Australian Pesticide and Veterinary Medicines Authority (APVMA). Instructions for use and withholding periods for milk and meat are described on the label.

Trained operators use clean and sanitized equipment to milk cows with minimal stress. Water used for cleaning is monitored to ensure it will not contaminate the milk. Milk is cooled promptly and stored until collection under temperatures to minimize the growth of microbial hazards.

Comprehensive records are maintained of key parts of the farm food safety program including use of chemicals, audit results and action taken if deviations are detected.

## G. Transport Regulation

All milk transport operators must have a documented Food Safety Program (FSP) approved by **State Dairy Food Authorities** (SDFAs). Core elements of the FSP include:

- control of food safety hazards during collection and transport from equipment, vehicles, containers and personnel;
- product traceability;
- time & temperature controls;
- personnel skills and knowledge.

The temperature and time of transport must be managed to minimize food safety risks. In peak season, collection usually occurs daily. When production declines, milk collections may reduce to a SDA approved frequency.

Prior to milk collection at the farm, tanker drivers sample milk for testing by the company. Typical tests include fat, protein, somatic cell count, microbiological quality and antibiotic residues. The results of the tests are provided to the farmer and used as a basis for payment. If an abnormal result is detected, the farmer is promptly notified of the result and appropriate action is taken.

On arrival at the factory, the manufacturer may sample the milk for further testing. Tankers are cleaned using Cleaning in Place (CIP) systems with approved chemicals and potable water.

Information on the origin of and destination of milk supplies is recorded to ensure traceability from farm to manufacturer and from manufacturer to farm.

## H. Manufacture Regulation

Once delivered to the manufacturer, milk is processed in modern and automated factories using responsible environmental practices. The relevant State Dairy Food Authority licenses all dairy factories while factories manufacturing product for export also require Australian Quarantine and Inspection Service (AQIS) registration. An approved Food Safety Program (FSP) is required prior to licensing.

Core elements of the FSP include:

- pathogen reduction technologies including pasteurization;
- temperature controls;
- processing;
- cleaning and sanitizing;
- storage;
- traceability forwards and backwards through the supply chain from farm to customer;
- post-pasteurization hazard management;
- raw material and ingredient management;
- records; and
- personnel competency.

Product specifications reflect compliance with customer requirements, regulatory requirements within the FSANZ Food Standards Code and in the case of exports, the requirements of AQIS and the importing country.

All suppliers of ingredients, cleaning chemicals, packaging and services work with dairy companies to ensure their materials and services meet exacting requirements, especially with regard to the traceability of ingredients and materials.

All dairy manufacturers have Product Recall systems based upon the FSANZ Product Recall Protocol. Auditors approved by regulatory agencies and AQIS audit all FSP. In addition, State Dairy Food Authorities and the Australian Quarantine Inspection Service monitor the quality of quality of milk and dairy products through investigations such as the AMRA survey.

## I. Export Regulation

The relationship between Australian dairy companies and their domestic and international markets has been developed over years through close communication with customers and consistent delivery of safe quality dairy products. Retail and ingredient customers within Australia and overseas apply rigorous buying specifications. Typical buying specifications include product specification, transport conditions and the buyers' expectations of the quality assurance approach. Competent authorities within Federal

and State regulatory agencies underpin the national approach to food safety and quality. The Food Standards Australia New Zealand (FSANZ) Food Standards Code covers all food products either manufactured within Australia or imported. All manufacturers, wholesalers, distributors and importers of food are required to have in place a written recall plan modeled upon the FSANZ Product Recall Protocol.

Under Australia's export legislation and importing country requirements, the Australian Quarantine and Inspection Service (AQIS) is the competent authority for export inspection and certification. Export regulations cover many requirements including the importing country's food safety requirements, product standards, biosecurity, quarantine standards and traceability.

Food Standards Australia New Zealand (FSANZ) under its Standard 4.2.4 requires all dairy farms to have a documented on-farm food safety program. All dairy manufacturers and processors must also have a documented food safety program. The State Dairy Food Authorities (SDFAs) implement the FSANZ standards. This approach to whole chain food safety reflects:

- International requirements under Codex (Code of Hygienic Practice for Milk and Milk Products);
- National requirements by Food Standards Australia New Zealand; and
- State-wide requirements by the Dairy Food Safety Authorities.

### III. Kenya

The various laws and regulations governing the livestock sector are given below:

#### **Ministry of Livestock and Fisheries Development (MoLD)**

The main functions of the MoLD include development of livestock industry, range development and management, veterinary services and disease control, livestock production and extension services, development of fisheries industry, development of bee keeping industry and hides and skins. Appropriate institutions under the Ministry include:

##### *Kenya Dairy Board (KDB)*

The main regulatory body in the dairy industry is the KDB, established under the Dairy Industry Act, Cap 336 of the Laws of Kenya. KDB has the responsibility of developing, promoting and regulating the dairy industry. The main functions of KDB are the enforcement of national standards for the dairy industry, training for the industry; facilitation of stakeholders' activities; maintenance of a databank for the dairy industry and regulation of imports. In practice, KDB has largely been a reactive institution that has concentrated its efforts in policing the activities of milk hawkers and other unlicensed



operators in the industry. This is to safeguard the cess, which provides nearly 80% of its revenue rather than acting in the interests of all consumers.

Other functions of the KDB include:

- Organize, regulate and develop efficient production, marketing, distribution and supply of dairy produce required by different classes of consumers;
- Promote quality assurance to attain the high quality products with emphasis on hygiene of milk production;
- Encourage proper use of milk containers for transportation and storage facilities for milk and milk products;
- Regulate the sales of raw milk and importation of dairy produce;
- Promote the consumption of quality milk and milk products;
- Develop, promote and advise on proper packaging equipment and materials;
- Licensing of milk producers and processors to permit a high degree of private enterprise in production and processing of dairy products;
- Enforcement of the Dairy Industry Act through anti-hawking operations and prosecutions;
- Training farmers on clean milk production and modern techniques of animal management through short courses and seminars.

#### *Kenya Livestock Marketing Council*

The Council regards itself as a private entity. The Council has set itself a number of ambitious objectives to include:

- Advocacy for the rights of traders;
- Promoting livestock and livestock products while marketing from pastoral areas;
- Identifying market gaps locally, regionally and internationally;
- Enhancing the dissemination of market information to both producers and traders;
- Liaison with pastoralists at grass root level;
- Support the exportation of live animals to alleviate poverty;
- Support the entrepreneurs investing in slaughterhouses, cold storages, and other premises for improved livestock marketing;
- Undertake extension services in liaison with the Government;
- Fund solicitation for credit facilities and offering group guarantees.

#### *Kenya Bureau of Standards*

Kenya Bureau of Standards is the statutory body charged with enforcement of standards and certification of quality standards of all products and services in the country. Its role is largely confined to the large processors and importers of dairy and meat products since

most of the smaller enterprises do not even have labels against which they can be traced. The various licenses/permits issued by KDB are given in Table below:

**TABLE: TYPES OF LICENSES/PERMITS ISSUED BY KDB**

Type of License	Those Eligible
<b>Primary Producer</b>	<ul style="list-style-type: none"> <li>▪ Dairy cooperatives/self help groups bulking and marketing milk on behalf of members</li> <li>▪ Dairy farmers selling milk directly to final consumers (hotels, schools etc)</li> </ul>
<b>Processor</b>	<ul style="list-style-type: none"> <li>▪ Dairy processing plants handling more than 5,000 litres per day</li> </ul>
<b>Mini Dairy</b>	<ul style="list-style-type: none"> <li>▪ Dairy processing plants handling less than 5,000 litres per day</li> </ul>
<b>Cottage industry</b>	<ul style="list-style-type: none"> <li>▪ Dairy plants processing specialty dairy products at the farm level</li> </ul>
<b>Milk Bar</b>	<ul style="list-style-type: none"> <li>▪ Small-scale milk traders operating in a certified milk shop</li> </ul>
<b>Cooling plant (below 5,000 litres per day)</b>	<ul style="list-style-type: none"> <li>▪ A milk bulking and cooling plant handling less than 5,000 litres of milk per day</li> </ul>
<b>Dairy Managers license</b>	<ul style="list-style-type: none"> <li>▪ Dairy managers in charge of dairies handling 500 litres and above of milk per day</li> </ul>
<b>Milk Carriage Permit</b>	<ul style="list-style-type: none"> <li>▪ Those transporting milk from one point to another</li> </ul>
<b>Import Permit</b>	<ul style="list-style-type: none"> <li>▪ Importers of Dairy Products</li> </ul>
<b>Export Permit</b>	<ul style="list-style-type: none"> <li>▪ Exporters of Dairy Products</li> </ul>

## IV. European Union

### A. Hygiene for Food of Animal Origin

The provisions of this Regulation apply to unprocessed and processed products of animal origin, but not to foods consisting of both products of plant origin and processed products of animal origin, unless expressly indicated to the contrary. Furthermore, this Regulation does not apply to the retail trade or to primary production for private consumption, for which the provisions of the above-mentioned Regulation on the hygiene of foodstuffs are sufficient.

Establishments handling products of animal origin must be registered and, where necessary, approved by the competent authority in their Member State. This does not apply to establishments engaged only in primary production, transport or storage of products not requiring temperature-controlled storage conditions, or retail operations not subject to the Regulation.

#### *Health marking and identification*

Where required by the Regulation, products of animal origin must be given a health mark applied in accordance with Regulation (EC) No 854/2004 laying down specific rules on the organization of official controls on products of animal origin intended for human consumption or, failing this, an identification mark applied to products before they leave the product establishment if their packaging and/or wrapping is removed or it is further

processed in another establishment. This mark must be legible, indelible and clearly visible for the competent authorities, and must show the name of the exporting country and the establishment's approval number where the operations took place.

#### *Imports from Non-EU Member Countries*

The Commission draws up lists of Non-EU Member Countries from which imports of products of animal origin are permitted, in accordance with the Regulation (EC) 854/2004 on official controls. In principle, a third country may only be included on these lists if a European control has taken place in that country and demonstrates that the competent authority provides appropriate guarantees that their provisions comply with or are equivalent to European legislation. Furthermore, Regulation (EC) 854/2004 provides that an establishment may only be included in these lists if the competent authority in the originating third country guarantees:

- that the aforementioned establishment, as well as any other establishment handling raw materials of animal origin used in the production of the products of animal origin concerned, comply with the relevant European requirements;
- that an official inspection service in this country carries out monitoring of the establishments and makes available to the Commission, where necessary, all relevant information on the establishments providing raw materials;
- that this service has the power to prevent establishments from exporting to the Union in the event that they do not comply with the requirements detailed above.

#### *Raw milk and milk products*

As regards primary production of raw milk, the specific health requirements are as follows:

- raw milk and colostrum must come from females of the species (cows, buffaloes, ewes, goats, other) which are in a good general state of health that do not show any symptoms of infectious diseases communicable to humans through the milk or colostrum and which are not suffering from any infection of the genital tract with discharge, enteritis with diarrhoea and fever, or a recognizable inflammation of the udder. The animals must not have any udder wound likely to affect the milk or the colostrum;
- subject to further, more specific provisions, raw milk must comply with microbiological criteria and standards for plate count and somatic cell count;
- milking, collection and transport of raw milk and colostrum must comply with clearly-defined hygiene rules in order to avoid any contamination. The same applies to persons involved, premises, equipment and utensils used in production.

The Regulation sets out the general hygiene requirements for heat-treated drinking milk and other milk products, dealing mainly with the preparation of pasteurized milk and

Ultra High Temperature (UHT) milk. Wrapping and packaging must be designed to protect milk and/or milk products from harmful effects of external origin. For control purposes, the labelling must clearly show the characteristics of the product, including where applicable the terms 'raw milk', 'made with raw milk', 'colostrum' or 'colostrum-based'.

## **B. Imports of Raw Milk and Milk Products**

Milk and dairy products which are imported into the European Union (EU) must meet basic animal and public health conditions. Compliance with these conditions should guarantee that milk and dairy products fulfill the requirements of European legislation. In addition, compliance with these conditions aims to maintain the public health situation within the EU.

### *Basic conditions*

All third countries wishing to export milk and dairy products within the EU must be included on the list of countries authorized to export milk and dairy products which is laid down in this Regulation. Prior to inclusion on the list, the countries must undergo an inspection by the Commission's Food and Veterinary Office (FVO) to demonstrate that they comply with fundamental animal and public health conditions.

Animal health conditions for imports of milk and dairy products are laid down in Directive 2002/99/EC. This Directive sets out the animal health rules governing the production, processing, distribution and introduction of products of animal origin for human consumption and establishes the animal health guarantees that are required for intra-Community trade in such products of animal origin.

### *Specific requirements*

All countries wishing to export milk and dairy products to the EU must comply with specific requirements. These include, in particular, processing requirements imposed upon the manufacture of milk and dairy products. The required treatments are described in this Regulation. They are established according to the health status of the exporting third country. Imports of raw milk and raw milk-based dairy products are only authorized from third countries with a high health status. Countries whose health status is less favorable (for example those where animals are vaccinated against foot-and-mouth disease) may only export pasteurized milk and dairy products made from pasteurized milk.

For each third country or part thereof, specific processing requirements are defined according to the health situation. These requirements must be complied with when manufacturing milk and dairy products in order to reduce, in particular, the potential risks of animal diseases. There is also a requirement that all establishments be approved for the production of milk and dairy products.

*Certificates*

Batches of raw milk and dairy products to be imported into EU territory must be accompanied by a health certificate issued by the official veterinarian of the exporting country. However, it is possible to use electronic certification or other systems that have been approved at European level.

*Transit and storage*

Batches of raw milk and dairy products which are in transit or stored on EU territory must meet the basic conditions and specific requirements applying to imports of raw milk and dairy products.

*Inspections*

Milk and dairy products entering the EU are inspected at a border inspection post (BIP). Veterinary checks are performed pursuant to Directive 97/78/EC laying down the principles governing the organization of veterinary checks on products entering the Community from third countries.

**C. Intra-Community Trade of Milk and Milk Products**

The intra-community trade rules for milk and milk products for human consumption solely govern the movement of those animal products between EU Member States. The following rules must be respected before milk and milk products can be traded within the EU:

The animal health requirements for intra-Community trade in milk and milk products are laid down in Commission Directive 2002/99/EC of 16 December 2002. This Directive lays down the animal health rules governing the production, processing, distribution and introduction of products of animal origin for human consumption and establishes the animal health guarantees needed for the trade in these products of animal origin.

The objective of this harmonization is to ensure that the same requirements are applied for trade between all the Member States thereby ensuring the safe and free circulation of the animal milk and milk products in the EU territory.

**1.** Milk and milk products for trade within the EU must fulfil certain basic animal health criteria. This ensures that milk and milk products conform to the animal health requirements laid down in Community legislation and this is intended to safeguard the animal health situation in the EU.

- Milk and milk products must fulfil the basic animal and public health requirements as laid down in Council Directive 92/46/EEC of 16 June 1992;

- The Directive lays down precise rules to be respected during all steps of the production of milk and milk products to try to avoid any possible spread of serious disease in the EU;
  - In addition specific requirements for milk and milk products are provided for trade within the EU. These include the treatment requirements used in the manufacture of milk and milk product. The treatments are specified in Commission Directive 2002/99/EC and are related to the animal health situation in the Member State of origin;
  - In addition other provisions are provided for by Directive [Foot and Mouth Disease] providing for rules to apply in case of outbreak of FMD. This means that if an outbreak of Foot and Mouth Disease (FMD) occurs, the milk has to be treated in order to destroy the virus and avoid further spread of the disease.
2. There is also a requirement that all establishments must be authorized to produce milk and milk products.
3. Because there are no border controls for movements between Member States, non-discriminatory spot checks are carried out at the point of origin and at the destination according to Directive 89/662/EEC of 11 December 1989 to ensure that consignments are in compliance with the guarantees provided by the legislation in force.

## B. POLICY AND INSTITUTIONAL SUPPORT FOR THE SECTOR

### I. India

The Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India has been operating 18 Central Livestock Organizations and allied institutions for production and distribution of superior germplasm to the State Governments for cross-breeding and genetic upgradation of the stocks. Besides, the Department is implementing various central sector and centrally sponsored schemes for the development of requisite infrastructure and supplementing efforts of the State Governments in achieving accelerated growth of animal husbandry sector. The gist of some of the key schemes that can be replicated in Ethiopia has been described below:

#### A. Central Herd Registration Scheme (CHRS)

Central Herd Registration Scheme is for registration of elite cow and buffalo breeds of national importance and provides incentive for rearing of elite cows and male calves. It plays a vital role in sourcing indigenous germplasm required for the National Project for Cattle and Buffalo Breeding. The scheme has a significant role in assisting the Department of Animal Husbandry of States and Union Territories, Private Sector and Government Undertakings in procuring elite dairy cows and buffaloes as well as bulls and progeny of high genetic potential for use in the development programme. The objectives of the scheme are following:

- (i) Identification and location of superior germplasm;
- (ii) Using this data for producing superior germplasm;
- (iii) Preservation of indigenous germplasm;
- (iv) Milk recording of Cattle and Buffaloes for improving dairy farming.

## **B. National Project for Cattle and Buffalo Breeding (NPCBB)**

Genetic improvement in bovines is a long term activity and Government initiated a major programme 'National Project for Cattle and Buffalo Breeding' (NPCBB) in October 2000 for a period of ten years, to be implemented in two phases. The Project envisages genetic up-gradation on priority basis. The project also has its focus on the development and conservation of important indigenous breeds. The project provides 100% grant-in-aid to the State Implementing Agencies (SIAs).

The objectives of the scheme are:

- a) To arrange delivery of vastly improved artificial insemination (AI) service at the farmers' doorstep;
- b) Bring all breedable females among cattle and buffalo under organized breeding through artificial insemination or natural service by high quality bulls within a period of 10 years;
- c) Undertake breed improvement programme for indigenous cattle and buffaloes so as to improve the genetic makeup as well as their availability.

The various components are as follows:

- d) Streamlining storage and supply of Liquid Nitrogen by sourcing supply from industrial gas manufacturers and setting up bulk transport and storage systems for the same;
- e) Introduction of quality bulls with high genetic merit;
- f) Promotion of private mobile A.I. service for doorstep delivery of A.I.;
- g) Conversion of existing stationary government A.I. centres into mobiles centres;
- h) Quality control and certification of bulls and services at sperm stations, semen banks and training institutions.

Institutional restructuring by way of entrusting the job of managing production and supply of genetic inputs as well as Liquid Nitrogen to a specialized autonomous and professional State Implementing Agency. At present 28, States and one UT are participating in the project.

In order to consolidate gains made during Phase-I of the NPCBB, Phase-II of the National Project for Cattle and Buffalo Breeding has been initiated from December, 2006 for a period of five years (2006-07 to 2010-11). The Phase-II will provide self-employment to

about 20,000 AI practitioners in delivery of AI at the farmer's doorstep. To improve productivity of bovine population, the proposal aims to bring 80% breedable females among cattle and buffalo under organized breeding through artificial insemination or natural service by high quality bulls. It also envisages undertaking breed improvement programme for indigenous cattle and buffaloes so as to improve the genetic make-up as well as their availability.

### C. Centrally Sponsored Fodder Development Scheme

This scheme provides central assistance to States to supplement their efforts in feed and fodder development. The scheme is being implemented from 2005-06 with the following four components:

- a) **ASSISTANCE TO FODDER BLOCK MAKING UNITS** - The livestock feed is presently based mainly on dry roughage from crops. The bulk density of fodder, hay and straws after thrashing is very low and hence requires large storage space. For this purpose, farmers neither have sufficient space nor time between harvesting of mature crop and sowing of next seasonal crop. As a result, crop residues, which are otherwise suitable for feeding, are quite often burnt in the fields. India produces approximately 393.9 million tons of crop residues annually, which could be useful for feeding the country's livestock population. Densification of roughage and waste crop residues in compact blocks is an effective solution for livestock feed management. It is also possible to formulate complete animal feed blocks using straw and diet supplements such as molasses, concentrates, minerals and salt. The activity could thus play an important role in productive utilization of crop residues. This will also enable efficient and cost effective transport of fodder upon its densification into fodder blocks. Upto 10 tons of feed blocks can be easily transported in a truck against 4 tons of loose fodder. The main emphasis here is on the prevention of wastage of crop residue and its concurrent utilization for livestock feeding by conversion into fodder blocks and bales. In order to encourage setting up of such units, an assistance of up to 25% of the investment cost is provided under the scheme. This assistance is provided for units under public or private entrepreneurship, including cooperatives and Self Help Groups. The relevant projects are required to be appraised by NABARD or any of the commercial banks;
- b) **GRASSLAND DEVELOPMENT INCLUDING GRASS RESERVES** - The scheme envisages improvement of degraded grasslands and rehabilitation of problematic soils like saline, acidic and heavy soils through vegetation cover. Under this programme, planting of specific grasses and legumes suitable for particular type of soil is promoted so that a vegetation cover may be provided to give fodder as well as to rehabilitate the degraded areas. The fertility status of land is also improved by introducing suitable legumes. Grasslands requiring regeneration through the process of natural recovery by closure/exclusion of biotic interference are also eligible for



funding under the scheme. This involves fencing of the area, establishment of soil and moisture conservation structures to support natural regeneration such as contour bunding, furrowing, ploughing, fertilization, etc. The degraded grasslands are slowly improved by introducing suitable grass cover on the same. The extensive erosion presently taking place on these lands will be minimized. The biomass produced helps to minimize the gap between availability and requirement. The forage obtained from these lands could be utilized for establishing fodder bank. The biomass production from grassland will be cheaper and support animal production. The Government of India provides 100% grant-in-aid to the Departments of Animal Husbandry and Departments of Forests for rehabilitation of degraded pasture/grasslands. NGOs/Village Panchayats are also involved for development of grassland on Panchayat land and other Common Property Resources;

- c) FODDER SEED PRODUCTION PROGRAMME - The area under fodder cultivation has remained static on account of preference for more remunerative grains, oil seeds and other cash crops. It is, therefore, necessary to produce high yielding varieties of fodder seed to make fodder production more remunerative. In order to encourage the fodder seed production in states, it is necessary to assure procurement of fodder seeds by making arrangement for buy-back of fodder seeds from the farmers. Under this component, 75% of the procurement price is provided for purchase of fodder seeds from the farmers. The State Government furnishes a firm commitment for purchase of fodder seeds from such farmers. The buy-back arrangement ensures interest of the farmers in taking up fodder seed production activity. The State Government furnishes, in its proposal, the details of fodder seeds, the extent of area, details of farmer with whom buyback has been entered into along with the modalities of this arrangement. The State Government may involve State Implementing Agency (SIA)/Cooperatives/NGO for implementing projects;
- d) BIOTECHNOLOGY RESEARCH PROJECTS - Research projects/special studies in collaboration with research institutes/agricultural universities etc. in the field of feed and fodder can be undertaken under the component. Research projects on feed and fodder involving bio-technology can be initiated for which 100% Central grant is provided.

#### D. Strengthening Infrastructure for Quality and Clean Milk Production

The Department introduced a new Centrally Sponsored Scheme namely, 'Strengthening infrastructure for Quality & Clean Milk Production'. The scheme is being continued during 11th Plan as merged with the 'Intensive Dairy Development Programme'. The scheme has the main objective of improving the **quality of raw milk produced at the village level in the country**. It is being implemented through the State Government by District Cooperative Milk Union/State Level Milk Federation.

Under the scheme, there is a provision for training of farmers on good milking practices. The scheme is being implemented on 100% grant in aid basis to the State

Governments/Union Territories for components viz. training of farmer members, detergents, stainless steel utensils, strengthening of existing laboratory facilities, adulteration test kit, disinfectants, etc. The pattern of funding for setting up of milk chilling facilities at village level in the form of bulk milk coolers is in the ratio of 75:25 between Government of India and respective Dairy Cooperative Society/Union/Federation.

### **E. Assistance to Cooperatives**

The Central Sector Scheme namely, 'Assistance to Cooperatives' started during 1999-2000, aims at revitalizing the sick Dairy Cooperative Unions at the district level and Cooperative Federations at the State level. The rehabilitation plan is prepared by National Dairy Development Board (NDDB) in consultation with the concerned State Dairy Federation/District Milk Union. Each rehabilitation plan is to be implemented within a period of 7 years from the date of its approval.

### **F. Dairy/Poultry Venture Capital Fund**

To bring about structural changes in the unorganized sector, measures like milk processing at village level, marketing of pasteurized milk in a cost effective manner, quality up-gradation and up-gradation of traditional technology to handle commercial scale using modern equipment and management skills and to encourage new species of birds and low input technology for poultry farming among rural farmers, a Central Sector Scheme namely, 'Dairy/Poultry Venture Capital Fund' was initiated during the 10th Five Year Plan and continued till the first year of 11th Plan. Subsequently, the scheme 'Dairy Venture Capital Fund' has been separated. However, loans to poultry sector is continued as per the approved guidelines of 'Dairy/Poultry Venture Capital Fund' scheme till a new scheme for poultry is approved. Under this scheme, assistance is provided to the rural/urban beneficiaries under a schematic proposal through bankable projects. Eligible beneficiaries, under the scheme, include agricultural farmers/individual entrepreneurs and groups of all sections of unorganized as well as organized sector including cooperatives and NGOs, from any part of the country.

The administrative approval for Central Sector Scheme – "DAIRY ENTREPRENEURSHIP DEVELOPMENT SCHEME" implementation during remaining 11th plan period. The Dairy/Poultry Venture Capital Fund scheme has been renamed as "DAIRY ENTREPRENEURSHIP DEVELOPMENT SCHEME" with greater coverage area, new components and change in financial pattern of assistance to make the scheme more effective.

## **II. Africa**

Dairy trends and production systems can be greatly influenced by policies. In Kenya, for example, the small-scale specialized dairy production system has witnessed enormous

growth within the past years, due to the vast adoption of policies favouring this system. Several policies have been suggested for development of the dairy sector of African countries, with each country laying emphasis on different parts of the dairy chain. Most policies sprout from a concept that, the dairy sector will realize a great impact if the production and productivity of milk is increased at national level to at least maintain self sufficiency, thereby reducing imports. The major policy areas of intervention on the African dairy sector are listed below.

### **A. Genetic improvement of dairy animals**

On a comparative basis, traits like age at first calving, calving interval, milk yield per lactation, lactation length and fat percentage have been used to evaluate production in dairy cows. Many studies have shown that local African breeds are less productive than exotic breeds. Some authors believe that, though local breeds are less productive, proper breeding schemes and management could greatly increase milk yields on a more sustainable basis (FAO 1990; FAO 2001; ILRI 2006). Others show that, the crossing of breeds within African countries could secure better production and adaptation to local hazards. A number of attempts to use exotic breeds in Africa have been successful, leading to a strong development of interest in policies which favour the introduction of such breeds. Exotic cow breeds are less adapted to African conditions are hence, more susceptible to diseases and environmental stress. Additional labour and capital input requirements for exotic breeds are a major constraint to farmers, who in most cases do not usually have access to credit facilities. The introduction of exotic breeds to Africa is usually governed by policies and most countries set control limits for semen or livestock imports with an aim of preserving local genetic resources. The situation was worsened from 1986, by the outbreak of the mad cow disease, which led to several laws banning the import of semen, livestock and other cattle products, which in some countries have not been completely uplifted till date. A compromising situation could be reached at by the practice of cross breeding, whereby, the crosses are believed to be more adaptable to local conditions than exotic breeds and more productive than local breeds. From these examples, three policy areas for genetic improvement are highlighted; those that improve on local breeds by selection and management, those which promote crossbreeding and those which promote the replacement of local breeds with exotic ones.

### **B. Promotion of the marketing and consumption of milk and dairy products**

Marketing is a very important aspect of the dairy chain. Presence of close by markets for milk and dairy products is a key motivating factor for milk producers. The promotion of marketing will require gathering of milk from several producers, transforming it to an acceptable marketable product and delivering it to consumers at the desirable time and at an affordable price. Due to high costs incurred in collection and cooling of milk, it is solicited that larger volumes are handled to reduce unit costs of transactions. A common

means of doing this is the installation of cooling centres for milk in production areas and the organization of farmers into dairy cooperatives. It is also important to note that a minimal milk supply level is required for profitable operation of such units. Encouragement of formal and informal markets for milk is a common policy area looked upon. Marketing policies are most convenient when they go along with policies that encourage milk consumption, especially in Western and Central African countries, where the per capita consumption is still very low. In Uganda, for example the DDA (Dairy Development Authority) promotes milk consumption using adverts on printed posters, in newspapers and over the radio. Promotion of milk consumption through an adoption of the School Milk Programme in Southern and Eastern Africa has also led to great changes in the dairy sector, as it is seen to improve on the livelihoods of the milk producers and also on the nutritional status of benefiting school children.

### **C. Provision of appropriate veterinary and extension services**

In order to produce milk, farmers first of all need knowledge which they can apply to intelligently combine all available resources to produce milk of acceptable quality, while optimizing profit. Due to modernization, technology is changing and more efficient methods of combining resources are evolving. African dairy farmers are in most cases of low educational background and need to acquire this knowledge through a simple and understandable approach. Provision of veterinary and extension services to farmers is such an important policy area in Africa. The provision of government incentives on veterinary and extension services is very important; though the promotion of private services may also be good, since public services are hardly regular. The impact of provision of such services could be measured in several ways. In Kenya, for example, training of farmers led to a reduction of calf mortality from 20% to less than 10%, within 4 years. The same approach also reduced mortality rates in Tanzanian cows (FAO 2001).

### **D. Provision of credit and farm inputs**

The provision of credit to livestock farmers could promote the adoption of improved livestock technologies especially in rural areas where most farmers lack tools. However, credit provision to dairy farmers is usually a very complex issue having difficulties in the decisions on the amount and form of credit, the interest charged, targeting of specific farmers' groups and specific activities, and repayment schemes. Most formal credit institutions are reluctant to provide loans to dairy farmers because they often don't have good sureties and are susceptible to epidemics which could lead to inability to pay debts. For easy management and reduction of transaction costs, credit institutions prefer to loan larger sums of money to fewer clients than to loan small sums to many dairy farmers. Therefore specific credit facilities are required for these farmers. The formation of farmer groups and dairy cooperatives could be helpful in three ways: firstly a group has better access to formal credits than individual farmers and secondly, external support or trainings from the public and private sectors is easier in groups, finally credit

schemes could be easily organized within the group. In some cases, it is possible to give credits in the form of farm inputs (feed, vet medicine, insemination, farm equipment, etc) and deduct credit refund directly from milk returns at cooperative level.

### **E. Milk import policies**

In order to promote the local dairy industry, African policy makers tend to discourage the importation of milk and dairy products. The import situation could be worsened in subsequent years as the WTO globalization policies are aiming at a reduction in tariff barriers hence, imported milk and dairy products will become cheaper. African governments have the following goals in selecting policies:

Provision of urban consumers with dairy products at affordable prices; generation of revenues from dairy imports; reduction of the amount of foreign exchange spent on dairy imports; and stimulation of dairy development, thereby generating income for producers and moving towards self-sufficiency in dairy products. At present, Nigeria is the highest importer of milk and dairy products in Africa (FAOSTAT 2006). This position has been maintained despite import reduction arising from two ways: first of all, by government regulations on milk imports through restricted import licensing, prohibition of fresh milk imports and imposing of specific import duties on dairy products, and secondly, after the devaluation of the Nigerian naira in 2001, leading to a reduction in the purchasing power and subsequently a drop in importation of milk powder and butter oil. The domestic industry also faces difficulties like lack of feed, low milk yields, competition from imports, inefficient extension services, lack of inputs and low milk prices which discourage local production.

### **F. Institutional support to the dairy sector**

In Eastern and Southern Africa, dairy development is supported by a number of institutes:

- The International Livestock Research Institute (ILRI) which has its head quarters in Nairobi, Kenya and a principal unit in Addis Ababa, Ethiopia. ILRI principally carries out livestock research as a tool for poverty alleviation and has recorded success and still plan many projects especially in the areas of disease control, animal breeding and feeding;
- National and international dairy boards which intervene actively in different parts of the dairy chain. For example, the ESADA (East and South African Dairy Association) is a quite new body which was formed in 2004 for Eastern and Southern African countries. The main aim of ESADA is to increase the trade in African dairy products and specifically, to actively lobby for an improved policy environment conducive to regional and international trade. In addition, it serves as a source of market information and assists her members in the promotion and marketing of their

products within the region and across the globe. Individual countries also have dairy promotion bodies such as the Kenyan Dairy Board, Dairy Development Authority (DDA, Uganda), Tanzania Dairy Board and Dairy Development Agency (DDA, Ethiopia). All these bodies usually work hand in hand with the government and function in promoting production, marketing and consumption of milk and dairy products and also guide in the implementation of related policies;

- The operation of many NGO's, the active participation of the private sector in offering services to farmers and the promotion of the formation of farmer organizations. For example, in Uganda NGO's like Heifer project International, Land O' Lakes, Send a Cow and Worldwide Sires all intervene in the dairy sector. The simultaneous involvement of private and public veterinary and extension services to farmers is worth mentioning.

### III. Kenya

Food processors in Kenya apply good manufacturing practices (GMP) through raw material handling and control, product and process management and control including documentation of all work routines, and, human resource management. They are supported by organizations such as Kenya Association of Manufacturers (KAM), and Association of Fish Processors and Exporters of Kenya (AFIPEK). The KAM exposes its members to business information on trade regimes like the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), South African Development Community (SADC), African Caribbean & Pacific-European Union (ACP-EU), and WTO. Such information includes safety and quality standard requirements the products must meet to be able to access these markets.

Department of Veterinary Services (DVS) enforces several laws that impact livestock marketing. These include the Animal Diseases Act Chapter 314 of 1972 (revised in 1989), the Dairy Industry

Act Chapter 336, the Pig Industry Act Chapter 361 [39] and the Meat Control Act Chapter 316.

The DVS and Kenya Dairy Board (KDB) play both the supporting and enabling roles by promoting and regulating activities in the dairy/livestock sector.

Kenya Bureau of Standards (KEBS) is a statutory Public body under the Ministry of Industrialization, operational since July 1974, and mandated by the Standards Act Chapter 496.

Kenya Bureau of Standards coordinates all activities concerning the development and implementation of both local and international standards relevant to Kenya. Under the Standards Act Cap 496, national standards become mandatory after publication in the Kenya Gazette. To improve on efficiency and provide more effective services to clients,

KEBS established a Certification Unit (CU), accredited by the Quality Systems Accreditation Committee (QSAC) that offers certification services. Kenya Bureau of Standards gathers information on quality concerns through industrial visits and receives private complaint samples for analysis in its laboratories as part of quality assurance and testing services components of its operations.

Kenya Bureau of Standards implemented the Pre-Export Verification of Conformity (PVoC) to Standards Programme. This is conformity assessment and verification procedure applied to specific Goods/Products at the respective exporting countries, to ensure their compliance with the applicable Kenyan Technical Regulations and Mandatory Standards or approved equivalents. The required minimum shelf-life of imported food items is 75% remaining upon arrival in Kenya.

#### IV. European Union

Milk production has traditionally formed the core of EU agriculture, comprising nearly 20 percent of the EU's total agricultural production. The EU's export surplus is small, around 5 per cent of total production, but this accounts for around one-third of total world exports. The EU milk price is supported through high tariffs, export subsidies and intervention buying-in arrangements. High tariffs mean that the EU market for dairy products is effectively closed to imports from third countries, apart from limited volumes which enter under quota arrangements and preferential agreements.

Support prices for dairy products have been reduced since the Agenda 2000 CAP reform in 1999. EU dairy farmers have been compensated by inclusion in the direct payments regime. Limits have been placed on the operation of the public intervention system to avoid the situation in the 1980s when intervention became the main market for many dairy processors. Reliance on export subsidies has been reduced in recent years as world market prices for dairy products have firmed and the EU specializes more in the export of higher-value cheese. However, they were temporarily re-introduced in 2009 as a mechanism to support milk prices in response to the very low prices in that year. Since 1984, the volume of milk produced in the EU has been limited by a quota although in recent years EU production has been below the quota ceiling. This quota arrangement is due to be eliminated from 2015.

#### V. USA

##### *Current Dairy Policies*

At the present time the major aspects of dairy policy include milk marketing orders, the dairy product price support program (DPPSP), the milk income loss contract (MILC) program, export subsidies and import tariffs.

Milk marketing orders have been around since the 1930s. Federal Milk Marketing Orders set minimum prices of milk based on end use and blend the revenues to assure all

farmers in the order receive a minimum average blend price. They were created to ensure an adequate supply of fluid milk and deal with equity issues across farms. Marketing Orders smooth out wholesale price changes to some degree as they blend product prices together and some prices enter with a time lag. The regional nature of milk marketing orders has fed disputes relative to dairy policy discussions in the past. Milk Marketing Orders are not intended to support milk prices but rather to pass a share of the value of milk on to the farmers based on end use and assure an average share to each qualifying producer.

The dairy price support program has existed since 1948 as an open offer by the government to purchase cheese, butter, and non-fat dry milk. Following several years of large government dairy product purchases to support those high prices, the support price was ratcheted down to a level that basically has not interfered with milk price since the early 1990s and volatility has increased greatly. In the most recent Farm Bill, the support program was changed from supporting milk price at the farm level to supporting dairy product prices which would then indirectly support farm milk prices.

The MILC program came about in 2002 and provides deficiency payments for milk when the price falls below a target level (i.e., \$13.69/cwt Class III milk). The payments were originally limited to the first 2.4 million pounds of annual milk production and later increased to 2.985 million pounds. A feed cost adjuster was later added to make the payments greater when grain price volatility increased. This program is much more important to small farms than large farms as a consequence of the payment limits.

Dairy trade regulations and the dairy export incentive program (DEIP) also have been important dairy policies. Historically, the US has exported about five percent of production in the form of bulk cheese, butter, non-fat dry milk, dry whey and whole milk powder. Prior to the world-wide recession that occurred in late 2008 the US had several years of export growth and appeared poised to be a major dairy supplier to emerging markets in Asia. The US generally imports about the same amount of product (in milk equivalents) but the imports are composed of higher value specialty products (e.g., specialty cheeses).

Cooperatives Working Together (CWT) is an industry, rather than a government, program that has been very important since its creation in 2003. The program is funded voluntarily by cooperatives and independent farm members. The funding has been utilized for herd removals ten different times, representing more than 510,000 total cows and subsidizing dairy exports.

Many existing dairy policies, like many existing US agricultural policies, have their origins in the Great Depression era. While these policies have been updated periodically and changed through Farm Bills, massive technology changes (both on the farm and at the processing and retailing levels) population and income changes, and a host of other



dynamics cannot possibly be reflected in slowly changing legislation and administrative rulings.

Trade policy is a key element of the U.S. Dairy Export Council's integrated market development strategy. Working through the U.S. government both to enforce and improve the rules governing international dairy trade, USDEC trade policy programs pave the way for effective promotion of U.S. dairy products.

Representing a diverse membership, USDEC also works closely with other organizations to attain a unified position when seeking government action on the industry's behalf.

USDEC trade policy initiatives exclude activities involving domestic dairy pricing policies. Trade policy activities are funded solely by membership dues and do not use funds provided through the dairy check off program or the U.S. Department of Agriculture. Dairy farmers provide significant input to the process through direct representation on the board as well through their cooperative's membership in USDEC.

### **C. AVAILABLE INFRASTRUCTURE WITH SPECIAL REFERENCE TO PROCESSING AND ITS EFFICIENCY**

#### **I. India**

On the processing front, out of the total milk produced in India, about 35 per cent is utilized for further processing. Milk is processed for the manufacture of pasteurized milk; traditional as well as western dairy products. Presently, about 46 percent of the total milk is consumed in the form of liquid milk, 47 percent as traditional dairy products and 7 percent as western dairy products.

Since 1999, the Index has found that India has produced more milk than any other country in the world and since 2006, milk production has increased by a CAGR of 4.3%. These high levels of consumption and production in the country are mainly driven by a population of 1.3 billion people, where milk is an integral part of their diet. Since majority of Indian population is vegetarian, milk serves as an important source of protein. In India milk or other LDP's are the most preferred food preparations such as in brewing tea and coffee, in making yogurt or curd and in preparing Indian dishes such as curries. Milk is also a popular beverage for children in India due to its high nutritional value.

Consequent upon de-licensing of Dairy Sector in 1991 under Industrial Development & Regulation Act, the Department of Animal Husbandry, Dairying & Fisheries had promulgated the Milk and Milk Product Order (MMPO) 1992 on 9/6/92 under section 3 of the Essential Commodities Act 1955. The objective of the order is to maintain and increase the supply of liquid milk of desired quality in the interest of the general public and also for regulating the production, processing and distribution of milk and milk products. As per the provisions of this order, any person/dairy plant handling more than

10,000 liters per day of milk or 500 MT of milk solids per annum needs to be registered with the Registering Authority appointed by the Central Government.

There is no restriction on setting up of new dairy units and expansion in the milk processing capacity, while noting the requirement of registration is for enforcing the prescribed Sanitary and Hygienic Conditions, Quality and Food Safety Measures as specified in Vth Schedule of MMPO-1992. In order to comply the provisions of Para 5 (5) (B) of MMPO-92, two inspection agencies i.e. National Productivity Council (NPC) and Export Inspection Council (EIC) of India have been notified for annual inspection of registered dairy units, on rotation basis.

As per present provisions, the dairy unit handling up to 200.0 TLPD of milk or 10,000 MT of milk solids per annum. Where the entire activity of procurement, processing and marketing of the dairy units lies within the State or Union Territory, the Registering Authority shall be an officer of the concerned State Govt. or Union Territories (U.T) and the dairy unit handling more than 200.0 TLPD of milk or 10,000 MT of milk solids per annum shall be registered by the Central Registering Authority. Accordingly Registering Authority shall deal with applications of registration and issue Registration Certificate under this order and perform within its jurisdiction.

Since inception the Central and the State Registering Authorities have registered 803 dairy units with combined milk processing capacity 881.50 lakh litres per day in Cooperative, Private and Government Sector upto 31.03.2008. Further the Central Registering Authority (CRA) has granted 12 new registration with the milk processing capacity of 25.0 LLPD (nine dairy unit for milk processing and remaining three units for marketing/trading), enhanced the milk processing capacity of 14 dairy units and cancelled the registration of 10-dairy unit during 2008-09. Now it has been subsumed as milk and milk products regulations under Section-99 of the Food Safety & Standards Act-2006.

#### *Case Study: ICT Applications in Dairy Industry*

A proof of concept application using Information and Communication Technology (ICT) in the dairy sector was developed by the Centre for Electronics Governance at the Indian Institute of Management, Ahmedabad (CEG-IIMA), Gujarat, India. The application aims at helping the dairy farmers with timely messages and educating them on the care for their milch cattle and enhance the production of quality milk. It also aims at assisting the dairy unions in effectively scheduling and organizing the veterinary, artificial insemination, cattle feed and other related services. The application uses Personal Computers at the milk collection Centres of the Dairy Cooperative Societies (DCS) having connectivity to an Internet Service Provider (ISP). The application includes two components - a Dairy Portal (DP) and a Dairy Information Services Kiosk (DISK).

### *Dairy Information Services Kiosk (DISK)*

With the initiatives of National Dairy Development Board (NDDDB), out of 70,000 dairy cooperative societies in the country, around 26000 are using Electronic Milko-Testers (EMT) and around 2500 are using the PC connected electronic milko-tester machines (known as Automatic Milk Collection Systems - AMCS). These systems introduced very satisfactory milk collection methods and facilitated immediate payments to farmers based on the quality and quantity of milk delivered. The success of these systems coupled with inexpensive connectivity opportunity offered by Internet, motivated the CEG-IIMA to enhance the PC at the Automatic Milk Collection Systems (AMCS) into a Dairy Information Services Kiosk (DISK) and offer an extensive knowledge and service delivery mechanism through a Dairy Portal. The DISK when used with a Dairy Portal of the Union, enhances the scope of services that would benefit the farmers as well as the dairy industry. Dairy farmers who are members of the DCS, the dairy farmers, visit the milk collection Centre of the DCS twice a day to deliver the milk. Thus, there exists enormous opportunity to interact with them on the issues related to DCS and union activities.

The Personal Computers have been in AMCS at the milk collection Centres to process the data collected by the electronic milko-testers. They have worked flawlessly at several rural societies for more than five years. Local agencies have gained experience and expertise to handle such systems in rural societies. Given this, the Dairy Information Services Kiosk (DISK) software is designed to be installed on the PC at the milk collection Centre of the DCS. The DISK software facilitates creation and maintenance of databases in the regional language of the society. It stores and maintains the databases of cooperative society members, their cattle, artificial insemination, veterinary, cattle feed and other service transactions in addition to the daily milk transactions. Based on this data, the DISK software generates alert as well as routine messages in the regional language, to be given to the farmers when they come to deliver the milk. These messages typically draw the attention of the farmer towards the health and productivity aspects of his milch cattle. In addition, the DISK generates several summary reports for the management of the society.

All the cooperative societies using AMCS have a telephone connection. By subscribing to an ISP operating in the region, the DISK PC (through a modem ) can use the existing telephone line to get access to the internet. Thus, with an ISP subscription and addition of a modem added to the existing hardware, the DCS can access the Dairy Portal and other web sites. Besides facilitating email messaging between members and their friends and relatives, the connectivity allows messaging and data transfers between members and union, and society and union. The DISK software compiles and distributes the messages received by the members. Similarly, the data to be sent to union can be dispatched by the DISK to Union either in the form of emails or through the Dairy Portal.

### *Dairy Portal*

The Dairy Portal is designed to provide an interactive dairy information and education channel to the members of the DCS (farmers) and others in the dairy sector. To a large extent, the contents are created and the interaction is facilitated in the regional language as well as English. A toggle button on the main page of the portal facilitates switching between these two languages. The portal can be accessed through just an internet browser (other than operating system and browser, no other software is required on the PC) by any authorized user on the internet. The Dairy Portal has textual as well as multimedia content useful to the farmers, extension workers, business executives and researchers dealing with the dairy sector. The portal mainly offers services such as education, entertainment, discussion forum, frequently asked questions, data transfers, application forms for submission to various agencies, e-commerce, and e-banking. On the education front, the portal typically it holds the data on best practices in breeding and rearing milch cattle, feeding and keeping animal healthy, producing high quality milk, care to be taken in buying and selling the cattle, and several other aspects to educate and advise the users. In addition, the portal gives hyper links to other rural education web sites. For example, the prototype portal has provided hyper link to SRISTI (an NGO working with IIMA) which has documented thousands of rural innovations in multimedia format. Hyper links are also provided to other sites dealing with the dairy sector. The portal also holds audio-visual material aimed at adult literacy using folk songs.

On the commercial front, the portal provides a platform for putting up announcements for buying or selling cattle. It is also planned to incorporate an e-banking module. It is expected that some banks would come forward to support the direct deposit of the milk payments to the farmers into their accounts and subsequently facilitate withdrawals through smart cards at conveniently located cash dispensing stations. The portal is created as two-tier architecture, with database software hosting and maintaining the data and the web server delivering static as well as dynamic the contents. Several technologies are used to create and deliver the contents on the prototype Dairy Portal.

## II. Kenya

Milk market liberalization policies announced in 1992 opened up the processed milk market, which hitherto was monopolized by Kenya Cooperative Creameries (KCC). The objective of the reform was to (1) encourage private investments (including co-operatives) in milk processing and marketing and (2) deregulation of both producer and consumer prices. The underlying argument was that enhanced competition would improve efficiency in milk procurement, processing and distribution, which in turn would result into regular and more remunerative prices to the farmers. It was also hoped that the efficiency gains would translate into higher quality milk products and lower consumer prices.

The dairy processing industry in Kenya makes a range of products including pasteurized milk, drinking yoghurts (plain and flavored), cultured milk (mala), UHT whole milk, low-fat and flavored, butter, a whole range of cheeses, full cream and skimmed milk powder and ghee. Since the liberalization of the milk processing in 1992 the variety of products, ways of packing and size of content has increased tremendously. The Kenyan retail market for dairy products offer the consumer a range of products, ways of packing and size of content, which is comparable with Western Europe.

Total milk production in Kenya in 2002 was about 3,100 million litres. The supply of milk is estimated to grow by 4.0% per annum up to 2010 and from 2010 to 2014 with 4.5 % per annum. MoLD and KDB consider the assumed growth rates realistic, given the growth in the actual milk supply between 1995 and 2002 of 4.0% per annum. According to the growth rates used, milk supply is expected to increase from 3,100 million litres in 2002 till almost 5,000 million litres in 2014. Per capita milk consumption in Kenya is characterized by a strong urban consumption bias, the ratio of urban-to-rural per capita consumption being about 63:37. Consumption of milk in Kenya is expected to increase steadily as population, urbanization and per capita income rise and is estimated to grow in the next 10 years with 3.0 % per annum up to the year 2010 and by 4.0 % per annum up to the year 2014. Based on these percentages projected consumption will increase from almost 3,000 million litres in 2004 till 4,147 million litres in 2014.

Following the foregoing trends and projections Kenya is likely to face a situation where production is increasingly higher than demand. In absolute terms the projected surplus will gradually increase from 354 million litres in 2004 to 837 million litres in 2014. As percentage of the estimated annual production the surplus is projected to increase from slightly over 10% in 2004 till almost 17% in 2014. Based on this figures Kenya has the potential to increase its exports. In total there are over 50 dairy processors of which at present about 30 are active.

#### *Use of Artificial Insemination (AI) for Improved Cattle Breeding Programme*

The Artificial Insemination (A.I) technology has been the main dairy cattle breeding method in the country for the last four decades. Through the use of A.I, there have been tremendous genetic improvements in the dairy sector in Kenya. For instance, the population of grade cattle in the country has increased from less than 250,000 in the 1960's to 3.2 million cows by 2001. This upgrading by using A.I complemented by nutrition and management improvements has been shown to have major impact on Kenya's economy and social welfare.

The privatisation of A.I services in 1992 was done with the anticipation that private sector would take up the role left by the government. In as much as the private sector have entered the A.I market, the use of the service has continued to decline. The Central Artificial Insemination Station (CAIS) currently monopolizes the production and distribution of local semen. The semen is produced from a bull stud made up of 77 bulls

of which 73 (95%) are dairy breeds. Out of this total, 73 are in production while the rest are below one year. Since 1992, the number of bulls has steadily decreased at an annual average rate of 3.5%. The decline has been attributed to inadequate government funding and reduction in the numbers of registered dairy herds. The two factors have led to a drastic decrease in the number of bulls recruited through the contract mating program. CAIS has the capacity to produce 0.5 million doses of semen per year. However, since 1993 the number of doses produced have averaged around 200,000, indicating a capacity utilization of only 40%.

Prior to 1992, only a few large-scale farms were getting access to imported semen. Since then there has been an increase in the use of imported semen even among the small-scale dairy farmers. Currently it is estimated that about 50,000 doses of semen are imported into the country. This represents around 22% of all the semen distributed in the country in 2001. About four main companies import the semen mainly from USA, EU and Oceania. The importing companies have distribution networks in the country that sells the semen in bulk to A.I providers and individual farms. Unlike the local semen that is centrally distributed from CAIS at Kabete, the imported semen is readily available in major towns in high potential districts. Most of the semen importers also use the storage facilities at CAIS at a fee. This way the importers have avoided the heavy investments in semen storage facilities. Some of the semen importers e.g. ABS have endeavored to vertically integrate their market operations by linking semen supply, distribution, training of inseminators and supply of equipment to inseminators and community based organizations. However, the government is yet to recognize the training offered by American Breeders Society (ABS) arguing that the curriculum has not been approved. The technical and policy issues surrounding the training of inseminators need therefore to be resolved with a view of attracting the much-needed private sector investments.

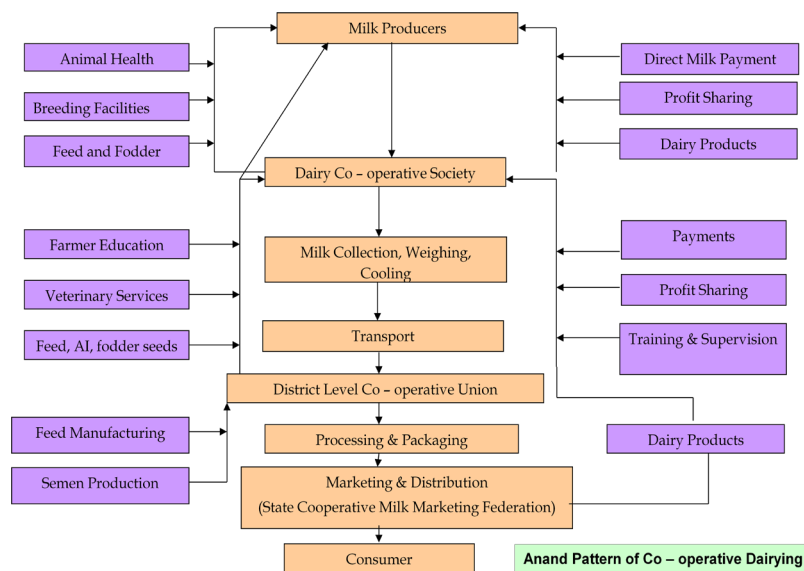
## D STUDY VALUE CHAIN AND COST BUILD UP STRUCTURE

### I. India

Anand model cooperative dairying has emerged as the successful dairy development programmes in India as depicted in Figure below (Adapted from FAO). The basic unit in this model is the milk producers' cooperative society at the village level. These cooperatives are organizations of milk producers who market their milk collectively. Any farmer can become a member by buying a share and committing to sell milk only to that society. Each member's milk is tested for quality with payments based on the percentage of fat and non-fat solids. All the milk cooperatives in a district form a union having its own processing facilities. The union buys the milk from all the societies and processes and markets the fluid milk and products. Most unions also provide a range of inputs and services to village level cooperative societies and their members, such as feed, veterinary care, artificial insemination and other extension services. The district level cooperative milk producers' unions in the state comprise the 'state federation', which is responsible

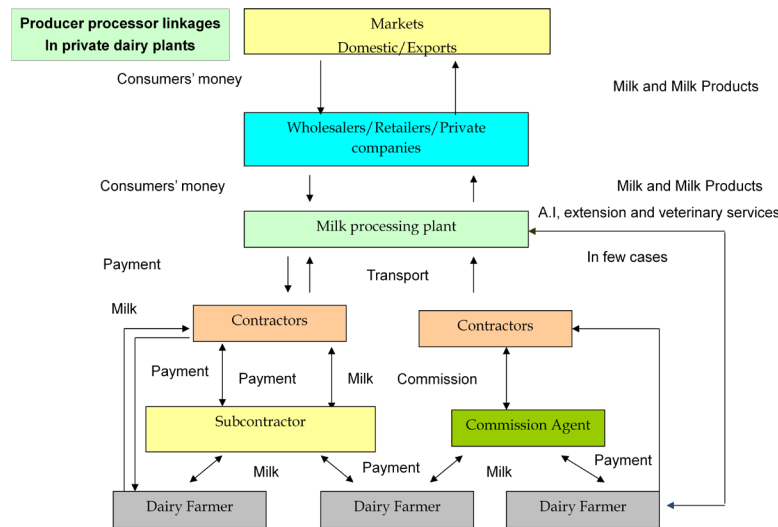
for marketing milk and milk products of the member unions. Some federations also manufacture feed and carry out semen production. There is also a fourth tier, the National Cooperative Dairy Federation of India (NCDFI), which is a national-level body that formulates policies and programmes to safeguard the interests of all farmer members. It also manages the National Milk Grid (NMG) and coordinates the deficit and surplus milk and milk powder across the states.

**FIGURE: ANAND PATTERN OF COOPERATIVE DAIRYING**



Private sector handles around 20 per cent of India's total milk production. But, unlike cooperative structure, private sector is highly fragmented. Partial decontrol of the industry in the early 1990's paved the way for many private players like Nestlé to set up their own milk processing facilities, mostly in milk surplus areas. Some of the private sector players also replicated the AMUL model by providing various inputs and services to the local farmers and procuring the milk from them. However, a large proportion of private dairy plants still depend on contractors/middlemen for raw milk procurement as depicted in Figure below (Adapted from FAO).

FIGURE: PRIVATE MODEL OF DAIRYING



The farmer members democratically govern the entire cooperative structure to ensure that the higher tier organizations are geared to serve the purpose of the lower levels and that the gains at all levels flow ultimately back to the farmers in a significant measure. The core feature of this structure is farmer involvement in decision-making at all three stages—procurement, processing and marketing of milk and milk products. The value addition at procurement and processing stages can be realized only with effective marketing of products, thus making it an essential feature for success.

The dairy unions affiliated to Gujarat Cooperative Milk Marketing Federation (GCMMF) provide various inputs that contribute to enhancing the productivity and quality standards, such as:

- Breed improvement and animal healthcare programmes;
- Extension activities;
- Supplies of balanced cattle feed on a no profit–no loss basis;
- Quality fodder seed distribution at subsidized cost;
- A network of artificial insemination centres aimed at genetic upgrading of the animals using frozen semen of pedigree bulls; these centres are managed by educated unemployed rural youth who provide breeding services to the farmers;
- Frozen semen, liquid nitrogen and other consumables;
- 24-hour mobile veterinary services for emergencies.

The GCMMF network is very strong, with farmer involvement at all levels in the chain. Thus it is difficult for private players to procure milk directly from farmers. The GCMMF collects its milk through village societies, with the cooperative setting the price. But it pays one of the highest prices in the country; milk collection is done in a transparent



manner (based on testing fat and SNF content). Livestock assets are likely to be better where organizations serving the area are involved in dairy development activities.

National Dairy Development Board (NDDB) continued to promote New Generation Cooperatives (NGC) initiatives in areas where large volumes of surplus marketable milk have remained untapped by the existing dairy cooperatives. By the end of December 2009, about 1,50,000 producers were organized into around 7,800 milk pooling points in nine States namely, Andhra Pradesh, Bihar, Gujarat, Haryana, Jammu & Kashmir, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. Collectively, they procure an average of 6,61,000 kgs of milk per day with a peak procurement of 10,80,000 kgs per day in 2009-10 upto December 2009. NDDB is working with the Institute of Rural Management Anand (IRMA) to design and develop Producer Company structures that would function as viable producer-owned enterprises. Some innovative practices in milk collection, testing and direct payment have been put in place to ensure transparency and build confidence amongst producers. A user- friendly payment solution in collaboration with a commercial bank has been introduced in some locations where money is transferred directly to the account of each producer and a Business Correspondent of the bank makes cash payment to the producers at their villages/nearby Bulk Milk Cooler centre.

Despite three decades of cooperative movement in India, however, a large proportion of milk and milk products in India continues to be marketed through the 'informal or unorganized sector'. Although the share of organized market has steadily increased over the last three decades, the informal sector comprising middlemen, private milk traders and direct sale from producer to consumer, still accounts for nearly 80 percent of marketed milk and milk products in the country. Trends indicate that, the informal sector will continue to play its dominant role in milk marketing in the foreseeable future.

The informal market thrives on poor willingness of consumers to pay the extra costs of formal processing and packaging. The informal market usually does not incur those costs and hence the market margins between farmer and consumer could remain smaller. This also implies that the informal market agents can afford to offer higher prices to farmers and lower retail prices to consumers.

Consumer preferences reveal that the market for value added milk products is small and most buyers are unwilling to pay for processing of any kind. Formal processes not only spend on quality control and packaging but also on trade taxes and are thus able to market to a niche segment only. Further, most consumers perceive fresh milk to be of superior quality and hence prefer to buy loose milk. Quality concerns such as bacteria levels in primary processed items like sweets and curd are often not attributed high priority and it is suggested that consumers are themselves not particularly worried about it. The advantages and disadvantages of various marketing channels are given in the Table below:

**TABLE: ADVANTAGES AND DISADVANTAGES OF VARIOUS MILK MARKETING CHANNELS IN INDIA**

	<b>Strengths</b>	<b>Weaknesses</b>
<b>Cooperatives</b>	<ul style="list-style-type: none"> <li>▪ Offer an assured permanent market;</li> <li>▪ Offer inputs, AI, feed and extension service;</li> <li>▪ No limit to quantity farmer can supply;</li> <li>▪ Farmers know their cash is safe;</li> <li>▪ Exert quality control over milk;</li> <li>▪ Farmers have sense of ownership;</li> <li>▪ Collection centers are usually not too far from the producers;</li> <li>▪ Bonus payment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Relatively lower prices where competition exists;</li> <li>▪ Sometimes there are delays in payment;</li> <li>▪ Farmers end up bearing the cost of any mismanagement in the cooperative societies.</li> </ul>
<b>Vendors/Hawkers/Middlemen</b>	<ul style="list-style-type: none"> <li>▪ Pay somewhat higher prices where competition exists</li> <li>▪ Prompt payment in cash</li> <li>▪ Payment can be negotiated as daily or monthly</li> <li>▪ Advance short-term loans</li> <li>▪ Collects milk from farmers' doorstep</li> <li>▪ Provides only market outlet in regions not well serviced by the formal procurement systems</li> </ul>	<ul style="list-style-type: none"> <li>▪ Chances exist that they may disappear with farmers' money</li> <li>▪ Not a reliable market</li> <li>▪ No supply of inputs and services or credit on inputs and services</li> <li>▪ Arbitrary changes of prices without prior knowledge</li> <li>▪ No quality control over milk</li> </ul>
<b>Hotels and Restaurants</b>	<ul style="list-style-type: none"> <li>▪ Slightly higher prices than cooperatives</li> <li>▪ Payment can be negotiated as daily or weekly</li> <li>▪ A reliable market</li> <li>▪ Cannot disappear</li> </ul>	<ul style="list-style-type: none"> <li>▪ No security – the business can close</li> <li>▪ No input or service support</li> <li>▪ Cannot take all milk</li> </ul>
<b>Private Dairies</b>	<ul style="list-style-type: none"> <li>▪ Prompt payments</li> <li>▪ Give true weight</li> <li>▪ Bears cost of spoilage once milk is received</li> <li>▪ Relatively better prices where competition exists</li> </ul>	<ul style="list-style-type: none"> <li>▪ Not always reliable</li> <li>▪ Arbitrary changes in the amounts they buy and the prices are fixed without prior intimation to farmer</li> <li>▪ May place limits on the amounts farmers can supply thereby excluding certain sections of milk producers</li> </ul>

*Financing the Dairy Sector: A Case Study of Reliance and BASIX (Adapted from Value chain finance: Beyond microfinance for rural entrepreneurs. Royal Tropical Institute, Amsterdam; and International Institute of Rural Reconstruction, Nairobi.*

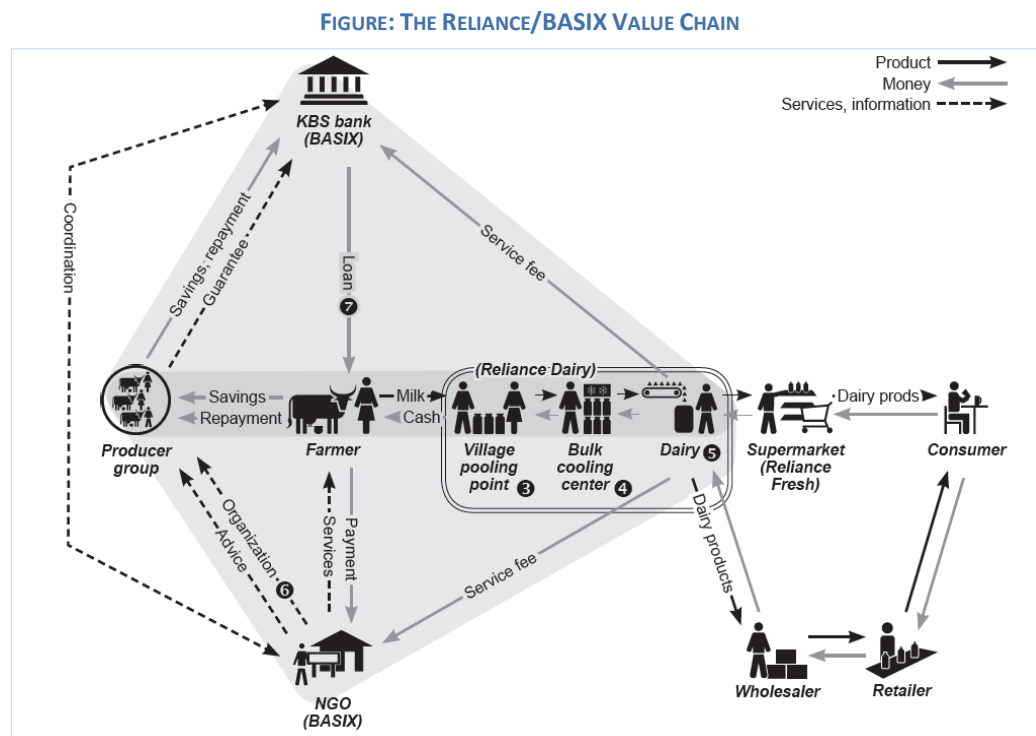
Reliance Fresh is a modern supermarket chain operating in this new market segment of urban consumers with higher purchasing power. The company is part of the Reliance Group, India's largest industrial holding. To secure a steady supply of fresh milk for its retail outlets, the Reliance Group established a specialized dairy firm in 2006: Reliance Dairy Foods Ltd. It supplies dairy products to the Reliance Fresh chain of supermarkets,

as well as to other urban retailers. When setting up its supply chain, Reliance chose not to source milk from the government-run dairies. The firm was not confident that these dairies could assure the quality and quantity required, and it was concerned about the payment terms and the danger of political interference. The company also decided not to use the existing private traders: it wanted to extend opportunities to others. So Reliance decided to build its own milk chain. It designed a supply chain consisting of three tiers:

- 1) VILLAGE POOLING POINTS, where the farmers can bring their milk on a daily basis, even in very small portions;
- 2) BULK MILK COOLING CENTRES, where the milk from various village pooling points is collected and cooled;
- 3) DAIRIES, where the milk from various cooling centres is processed, packaged, and distributed to the market outlets.

Reliance figured that, rather than controlling the full supply chain by itself, the best way was to train selected local villagers and provide them with the necessary infrastructure and technical support, so they could operate the pooling points and cooling centres as independent business people. This is a so-called franchise model.

Reliance started pilot operations in two areas: in Mehboobnagar in Andhra Pradesh and in Punjab in the north of the country. But Reliance realized that it could not do the job alone. The company was new and it had no experience in organizing rural villagers and training them to become part of a supply chain. It needed a strong partner to ensure that the village end of the chain functioned well.



In January 2008 it signed an agreement with KBS Bank, a subsidiary of BASIX, to organize and support milk producers in Mehboobnagar and to build up the Reliance value chain. Reliance pays BASIX a service fee of Rs 0.40 for each litre of milk procured from its customers. The Reliance/KBS Bank team surveyed villages in the district to discover their milk production potential. They appointed local people to run the village pooling points and cooling centres. They set up the infrastructure in each location, and trained these people how to manage the equipment and run the service as a franchisee. They supported the farmers to elect one person in each village to act as a joint account holder to receive and manage the milk payments on behalf of all the farmers.

BASIX works in 40 villages (with the same number of pooling points) that supply four cooling centres. It promotes farmer producer groups in each village, provides agribusiness development services, and extends microfinance to the producer groups. KBS Bank provides loans, while BASIX provides agricultural and business development services for KBS Bank customers.

BASIX helps producers in each village form groups to improve their productivity and management abilities. Members of the producer groups are farmers who wished to expand and improve their dairying activities. The average group has 15 members. BASIX offers various business development services to members of the producer groups:

- IMPROVING PRODUCTIVITY - Selecting stronger and more productive animals, advising on feed and fodder management, and buying inputs in bulk;
- DISEASE PREVENTION - Vaccinations against foot-and-mouth disease, regular deworming, and periodic visits by veterinarians to check on the animals' health;
- MARKET LINKAGES - Forming producer groups and providing institutional development services to help farmers supply milk to the Reliance pooling points;
- CAPACITY BUILDING - Training on bookkeeping, accounting, management and help with formalizing the group.

Once a producer group is formed, it opens a joint account with KBS Bank and starts saving regularly (usually \$1–2 per member each month). If it performs satisfactorily for at least 3 months, the bank will consider providing investment loans to the individual members. Hard collateral is not required, but group members must all guarantee repayment of the loan. The bank can disburse the loan within 15 days of the application. The average loan is for the equivalent of \$440 – enough to buy a buffalo. Borrowers are responsible for repaying their loans on a regular basis. If the member falls behind with repayments, the group as a whole must pay up, so peer pressure is an important and effective way of ensuring repayment. KBS Bank also provides savings services and livestock insurance coverage to the members of producer groups.

## II. Kenya

The dairy value chain is extensive, significant to both national and household income and is growing. 5.7% of Kenyans are engaged to some degree in the dairy value chain with the majority of the production coming from the Rift Valley and Central provinces. However, to a lesser degree there are 11 other “milk sheds” with significant production and processing in other parts of Kenya. Dairy contributes USD 1.1B, the largest amount of any value chain reviewed equating to 3.5% of GDP. On average it contributes USD 599 per household involved.

While the dairy value chain is well commercialized, trade is still dominated by small scale, informal traders. While there are technical supports and credit relationships among value chain actors, these are far short of their potential. This is probably not so negative for the time being and in time competition and consolidation will increase economies of scale and strengthen relationships between actors. The Government of Kenya has strategically supported dairy and has wisely stepped away from any involvement in the buying and selling of dairy products.

Adequate infrastructure and strong concentration of dairy production and, especially, processing will facilitate the continued development of financing strategies for dairy. Several financial institutions are already engaged but there remains much room for improvement in the provision of savings and credit services. In terms of food security, dairy contributes a lot of cash to household incomes but given that milk is highly perishable, it cannot be practically stored. Nonetheless, milk and milk by-products are an important contributor to the Kenyan diet.

- With respect to Inputs, the input supply is very competitive with many suppliers and dealers (feeds, veterinary drugs, dairy breeds and AI material). Even at very low levels, input suppliers furnish the smallest of volumes. According to the literature, when limited adoption of improved breed and feed in some areas is witnessed, it is not at all related to non-access but rather to demand issues such as preference for particular breed, herding system and value attachment to the breed kept;
- While dairy production in Kenya is the most commercialized in the Eastern Africa region (evidenced by the increased adoption of artificial insemination for better breeds, good dairy farm structures, investment in fodder crops and improvement, concentrate feeding practices for maximum milk yield, and feed conservation practices, high yields, high return on investment, among others), there are no production contracts at producer level, save for linkages to cooperatives and self-help groups milk collecting centres and informal buyers dominate the marketing channels;
- Producers received 63% of the processor purchase price (on average KSh 22 of KSh 35) which compared favourably with other commodities;
- Considering the number of wholesalers, the dairy value chain was considered highly competitive comprising of both formal and informal channels. The informal channel

dominates milk marketing by handling over 70% of milk sales. Recently, Kenya Cooperative Creameries (KCC) monopoly was abolished to encourage competition. There are over 50 licensed milk processors with inbuilt processing capacity of more than 3 million litres per day; more than 8 mini-dairies; 55 dairy cottage industries; and 110 milk bars and other 1,300 licensed milk dealers. This clearly indicates healthy wholesale competition. Both private and cooperative bulkers operate. Private bulkers are very profitable and are thus steering the trend of the wholesale market. There are no price controls on milk marketing;

- Diversification of value addition for the dairy value chain was excellent and sophisticated at both cottage and industrialized levels based on the literature reviewed. Pasteurized and flavoured milk, Ultra Heat Temperature (UHT) milk, powdered milk, mala, yoghurt, ice cream, cheese and butter are produced and marketed. At cottage level, the additional return on value added provides impetus for higher volume of milk purchases;
- When considering the number producers versus population of Kenya, the dairy value chain is estimated to include 5.7% of Kenya's households. This high figure is substantiated by triangulating using the fact that Kenya has the largest dairy herd in Eastern or Southern Africa;
- Contribution to GDP by the dairy value chain was 3.5%. Comparing this contribution to other value chains evaluated, Dairy made the largest contribution and thus was awarded the full five percent available for this rater. When calculating value per producer, the dairy value chain's USD 1.1b divided by 1.8M producers yielded an annual value per producer of USD 599. This was below the average of the other value chains evaluated.

While milk and its products are staples for many Kenyans as evidenced by the fact that Kenya is one of the highest per capita milk consumers in the world (100 grams per person versus the 25 gram global average), the product is highly perishable and only stores once it has been professionally processed (which is not done on farm). Daily cash sales of milk, as seen as a source of food security, were very robust. 3.8B litres of milk were marketed in 2007. Clearly this constitutes strong evidence that substantial incomes are realized by dairy producers and other value chain actors that adequately matches their food purchase requirements.

Dairy was a relatively high potential commodity to bank given the size of the industry, its level of development, the strong value chain relationships, the strength of the market and the high value added at producer level. With respect to existing credit and risk management the dairy value chain was very strong according to the documents reviewed. Commercialized producers, private bulkers, transporters, the majority of cooperatives, processors and terminal markets dealers realize returns capable of attracting commercial finance and are thus creditworthy. Several financial institutions are lending to the dairy value chain (Equity Bank, Coop Bank, KCB, K-Rep and Family

Bank, and others). Livestock mortality and theft insurance products are available and accessible. There is some formal credit to the dairy sector and this seems to be growing. For the most part, however, dairy businesses receive generic credit products if they receive credit at all. With respect to savings products, payments by processors and cooperative bulkers are made through financial institutions but there is limited evidence to suggest that the beneficiaries and financial institutions consider these cash flows savings.

Access to buyer credit from buyers to sellers in the dairy value chain included: equipment provided by the bigger processors (both Brookside and New KCC provide cooling equipment to a number of bulkers and also quality testing and volume measuring equipment to contracted transporters); feed suppliers and veterinary drugs dealers offering inventory credit to some of their agents and stockists; limited producer credit from feed and vet drugs stockists; and cooperatives extending inputs credit to their farmer members that is recovered from milk deliveries.

The dairy value chain is clearly a Government of Kenya priority. Dairy is placed very high in the broader national goals of poverty reduction, employment creation and food security. Further, dairy is the largest agricultural sub-sector in Kenya and according to the literature reviewed; commercial smallholder dairy production is considered by government as providing one of the best conduits for meeting poverty reduction and economic growth goals as it underpins sustainable employment generation. The government has been influential in extending the reach of Artificial Insemination services and improved breed stock. Finally, the dairy sector is duty exempt and fully liberalized.

Government of Kenya Intervention was historically an issue for the dairy value chain but the sector is fully de-regulated and highly liberalized. Government puts emphasis on private sector mechanisms for the dairy sector and has done enough to counter the pressure of big players to keep off the informal dealers from the market. The Kenya Dairy Board, established by national legislation, is mandated to efficiently and sustainably develop, promote and regulate the dairy industry. The Kibaki Commission actually abolished contracted milk quotas and opened up KCC to all farmers. Any perceived interference by GoK in the dairy sector (research, disease prevention and control, etc) is pro-development of the sector rather than impeding its growth, and has thus not had distorting impact on the dairy market.

There was strong evidence of access to services for the dairy value chain from the literature reviewed. The Kenya Dairy Competitiveness Project, the Gates Foundation, public extension services, Kenya Dairy Board and others are providing services to the sector. Technical assistance services provided include improved flow of feeds, addressing the impact of post election violence, better animal husbandry practices, better breed selection, and quality maintenance within the value chain. Further, USAID has contracted Land O' Lakes to provide business development services in 13 milk sheds.

Regarding value chain service provision, for the dairy value chain, there was also strong evidence of support between buyers and sellers according to the literature reviewed. Dairy transporters and bulkers provide technical assistance to their suppliers. Also processors, in partnership with Kenya Dairy Board, provide technical assistance to smallholders.

With respect to concentration of clients, the dairy value chain is strongly concentrated in six geographical areas. The largest is the Rift Valley with 53% of production followed by Central 25%, Eastern 6%, Western 6%, Nyanza 5% and Coast 3%. While these six are indisputably the largest concentrations, technical assistance providers contend that there are additional seven milk sheds with significant volumes of milk and processing capacity.

Access to minimum infrastructure for supporting financial services to the dairy value chain is basically assured. Clearly the majority of production and processing centres around urban and peri-urban areas in the Central region and Rift Valley. Hub and spoke banking arrangements can easily reach the large potential clientele in these areas. Other than for these provinces, smallholder dairy production is in the rural areas. The condition of the infrastructure in such areas was not in the least captured by the documents available for review, nor beyond.





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## **DAIRY SUB-SECTOR STRATEGY**

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