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Gender assessment of dairy value chains: evidence from **Ethiopia**

Edemo Herego

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Women working in milk reception in the processing plant of the Salale Union in Ethiopia.
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Preface

Milk and dairy production are crucial for the daily food security of rural families throughout the world. They are a vital source of nutrition and provide important livelihood opportunities for dairy farmers, processors, transporters, retailers and other dairy value chain actors.

Women play a significant role in activities related to animal husbandry and dairy production. However, their participation is commonly concentrated at the production level, in less profitable activities than those of men. They often remain excluded from the decision-making processes and governance structures of dairy value chains. Few national dairy policies or programmes adopt a gender perspective when defining their strategies. Consequently, women and youth tend to benefit much less from livestock and dairy value chains than men.

Governments and development practitioners need up-to-date information about the different roles, responsibilities, needs and constraints of women and men involved in the dairy sector in order to inform policies and interventions that contribute to inclusive and gender-sensitive value chain development.

The Social Policies and Rural Institutions Division (ESP) and the Animal Production and Health Division (AGAH) of FAO, in collaboration with the FAO Representation in Ethiopia, undertook a detailed gender assessment of the dairy value chains in selected sites of the country.

The resulting publication draws on the evidence gathered through fieldwork and the review of specialized background documentation. The result is a comprehensive overview of the gender issues in dairy value chains in Addis Ababa, North Shoa Shewa Zone (Degem *woreda*), East Gojam Zone (Dejen *woreda*) and Gamu Gofa Arba Minch Zone (Arba Minch Zuria *woreda*).

The report represents an important step towards a deepened comprehension of gender issues in dairy value chains in the Ethiopian context. It provides country-specific recommendations for Ethiopia, which also feed into a more general knowledge base on how to develop gender-sensitive dairy value chains, hereby contributing to the ultimate goal of closing the gender gap in the agricultural sector.

This report is part of a series of country assessments:

- Gender assessment of dairy value chains: evidence from Kenya
- Gender assessment of dairy value chains: evidence from Rwanda
- Empowering women in Afghanistan: reducing gender gaps through Integrated Dairy Schemes.

Acknowledgements

The study was carried out in consultation with the FAO representation in Ethiopia under the direct supervision of Regina Laub, Senior Officer (FAO Social Policies and Rural Institutions Division, ESP), Raffaele Mattioli, Senior Officer (FAO Animal Production and Health Division, AGA) and Anni McLeod, international consultant. Alejandra Safa and Francesca Distefano, Gender and Development consultants (FAO, ESP) provided valuable inputs and technical guidance throughout the study. Rosa Capuzzolo (FAO, ESP) provided significant administrative support.

The study benefitted from the technical inputs provided by FAO experts Filippo Brasesco, Sofie Lambert, Tek Thapa and Marcello Vicovaro.

In Ethiopia, the assignment was facilitated by Amadou Allahoury Diallo, FAO Representative, and by Workicho Jateno, Team Leader and Gender Focal Person, Gedlu Mekonnen, Programme Coordinator, Yami Alemu, National Animal Feed/Livestock Expert, Hussein Kebede, National Team Leader, and Sasahu Terefe, Programme Administrative Assistant.

The author would like to acknowledge the time and effort contributed by the many individuals and organizations consulted in Ethiopia, including officials and experts at government offices, research institutions, bilateral and multilateral development organizations, sectoral associations, processors, cooperative and unions, traders.

Special thanks are due to Anteneh (Gamu Gofa Zone Livestock Office), Dereje (Degen *woreda* Livestock Office) and Askale (SNV Ethiopia Office in Degen *woreda*) for their organization and facilitation of discussions and communications with communities and stakeholders during field visits, and to the community members who devoted their time and shared their opinions, views, perceptions and practices related to study issues and questions.

Thanks need to be extended to Barbara Hall who led the editing process and proof-reading and Andrea Wöhr for the layout and design of the publication.

Executive summary

This report presents the findings from a gender assessment of dairy value chains in Ethiopia, which is part of a series of similar studies carried out as well in Kenya and Rwanda. It aims to formulate country-specific recommendations for Ethiopia, and to contribute to developing general guidelines on how to implement gender sensitive initiatives in the dairy value chain.

The assessment considered:

- women and men's roles and responsibilities, their different benefits, opportunities, needs, constraints and challenges along the value chains;
- economic opportunities arising along the value chains, as well as women and men's capacity to access them; and
- factors contributing to reduce gender inequalities in the value chains.

It included extensive review of literature, interviews with key informants in Addis Ababa, and fieldwork in three selected study areas (*Degem woreda*, *Dejen woreda* and *Arba Minch Zuria woreda*), where information was obtained from focus group discussions and interviews with government line offices, key informants, households and individuals involved in dairy value chains.

Ethiopia has the largest cattle population in Africa, with an agro-ecology, particularly of mixed crop–livestock systems in the highlands, which is considered conducive to supporting crossbred dairy cattle. The country has an estimated cattle population of 52 million, including 10.5 million dairy cattle, and produces approximately 3.2 billion litres per year. The farm-level value of the milk is estimated at ETB16 billion per year (US\$889 million).

In 2013, cattle accounted for about 77 percent of the milk produced annually and approximately 11.4 million households were engaged in livestock production. Cattle was the dominant species in 70 percent to 90 percent of livestock producing households. In 2010, dairying created an estimated 588 000 full-time on-farm jobs and was considered to have the potential to create more given the untapped potential of the dairy sub-sector.

In spite of such substantial potential and long-term efforts by development agencies and the Government, the dairy sub-sector is not highly developed. The annual growth rate in milk production of 1.2 percent lags behind the annual human population growth estimated at 3 percent. The traditional milk production system, which is dominated by indigenous breeds with low production levels, accounts for about 97 percent of the country's total annual milk production. The production of the national dairy herd is low, and costs of production are high. In addition, smallholder dairy products are not commercialized, and only about 15 percent of fresh milk is supplied to market due to lack of infrastructure and market linkages.

Consequently, the contribution of this sub-sector to the agricultural economy of the country remains lower than it could be, accounting for 30–35 percent of the national agricultural output and 40 percent of agricultural export value. The present national average per capita consumption of milk is low (i.e. 19 litres/year) compared to the average of 30.2 kg/year per capita in sub-Saharan Africa and to the 84.9 kg/year of the world's average (FAO, 2013b). Projected estimates have predicted that if dairy sub-sector growth continues at the current pace of investment, in Ethiopia there will be a 23 percent deficit for milk (1 958 million litres) by 2028 as a result of rapid population growth and rising per capita income.

The challenges that have contributed to the underdevelopment of the dairy sub-sector include: lack and high cost of concentrate feed, prevalence of animal diseases coupled

with poor veterinary services, low productivity of the local dairy cattle and the problem of accessing artificial insemination (AI) or improved bull services, high cost of transportation and lack of milk chilling facilities, low levels of market linkage among the value chain actors, seasonal fluctuation of demand leading to inconsistency in milk supply, and lack of milk quality and grading standards and regulatory body. There are gaps in smallholder farmers' skills and in the effectiveness of government policies.

The assessment confirmed that the dairy sector is important to Ethiopia's economy and society. Men and women are involved in dairy value chains, but in different ways, and they face different constraints. Dairy production is particularly important to rural women, providing them with income and a means to meet social obligations. They do not have the same opportunities as men to participate in all parts of the dairy value chain and have a very limited role in the leadership and management of cooperatives and private enterprises. Women are more involved in management of dairy cattle than in other parts of dairy value chains, and have only limited involvement in formal processing, input supply, and retail or value chain governance.

Published studies as well as this assessment show that women have important roles in managing dairy cattle. They are often involved in feeding, watering and milking animals reared close to home, such as in mixed systems and in traditional processing and marketing of livestock products. There are very few women members in cooperatives, unions and associations, particularly in leadership positions. Anecdotal evidence also suggests that when women's cooperatives are established, they need more support than men's cooperatives, such as capacity-building in management as well as time and energy-saving support services in order to succeed.

Gender division of labour varies across regions. For example, women in Arba Minch Zuria *woreda* in the Southern Nations, Nationalities and Peoples Region (SNNPR) are responsible for taking care of animals with the help of children; they gather fodder, milking and traditional processing and selling products. Men are responsible for branding of livestock, herding animals between grazing fields, watering, and purchasing and selling of livestock. Gender division of tasks and responsibilities is not strict, and decisions on crop and livestock production overlap and influence each other. According to focus groups discussions (FGDs) and households and individual interviews, when men are absent, women carry out their tasks. Focus on women in dairy production in this *woreda* may be seen as an opportunity to use it as the entry point for women's empowerment.

In the other two communities assessed by this study (Degem *woreda* in Oromia Region and Dejen *woreda* in Amhara Region), men have a greater involvement in dairy production as compared to Arba Minch Zuria *woreda*. The trend is more evident in the case of Oromia Region, and is mainly because dairy production is able to generate continuous income and has become attractive to men. There are recent developments, i.e. today men are more inclined to recognize women's contributions to dairy production in Oromia region. They now see, for example, fetching water and cleaning the utensils as work that contributes to the quality of the product. Several couples have started working more together, discussing their plans, and sharing tasks that women used to do alone.

There is an increasing awareness in Ethiopia of the important and traditional role of women in dairy production. Dairy production provides women with a regular daily income, vital to household food security and family well-being. In the past, development interventions targeted men, and changes introduced frequently resulted in higher labour input by women while their control over production and output diminished. Gender differences are now more often taken into account at all stages of development planning and management but this still needs to be improved.

Women participate less strongly in other stages of the value chains and benefit less from them. They face major constraints in fully participating in dairy value chains or even expanding dairy production activities. Many of the constraints listed below are also generally experienced by men, but are more prominent among women, who often face an overlap of several of these constraints.

- lack of a gender-sensitive extension system, which reduces their ability to learn about new ideas in dairy production;
- inaccessibility of infrastructures and services such as collection points, cooling facilities, and animal health services;
- lack of supportive technologies such as time and energy-saving facilities, which might allow them to expand production or add new activities;
- lack of appropriate credit due to lack of property title deeds among women, which reduces their ability to invest in dairy production and expansion as well as in activities such as processing, retail and input supply;
- lack of experience and capacity building in management, limiting their ability to play a part in value chain governance;
- lack of access to training opportunities, reducing their opportunity to expand into areas such as processing and animal health service provision.

Based on findings from the review of literature and the interviews conducted during this study, conclusions were reached concerning the development of gender sensitive dairy value chains in Ethiopia. A general pre-condition, allowing to meet growing demand for dairy products, is a comprehensive approach to dairy development. This includes appropriate combinations of technical interventions and related policy changes to improve livestock productivity, including investing in genetic improvements, fodder availability and veterinary services. The following recommendations are specifically aiming at gender-sensitive dairy value chain development:

- To build a gender sensitive dairy value chain, the possible entry points to be addressed include: (i) smallholder farmers, particularly women (as they are major players at the production level) need support to increase milk production in yields and quality; (ii) pooling of milk collection and transportation activities has the potential to mitigate the cost and enhance integration of producers, especially women to the value chain; (iii) men's and women's involvement in collecting and/or trading dairy products can be enhanced by organizing groups/cooperatives (which could be women only or mixed) in remote Kebeles.
- Women's empowerment is vital for sustainable, gender sensitive dairy value chain development. In dairy production, where women already play an important role, it will be important to ensure that any scaling-up or intensification of production does not result in their exclusion. Projects supporting the development of gender sensitive dairy production need to make greater efforts to facilitate equal access for both men and women to training, technology, infrastructure and credit.
- Women should also play a larger role in other parts of the value chain:
 - In order to bring in women as cooperative members, as well as in management/ leadership positions, a strategy to enhance gender equality should focus on building their organizational and management skills. There is a need to support farmers' organizations (cooperatives) to strengthen their capacity to manage value chains. Women and men should both play a part in farmers' organizations and cooperatives that are critical to value chain governance.
 - Opportunities to build successful women-led dairy cooperatives and associations should be promoted by intensive capacity building that enhances women's awareness of the benefits of cooperation, membership duties and responsibilities, and builds communication, negotiation, advocacy, and management skills.
 - Access to energy- and time-saving technologies will provide women with more time to take up management roles.
 - There is a need for dairy development programmes to ensure that women have greater access to credit to enable them to establish small businesses in processing, retail, feed supply, etc.
- Activities will need to be situation-specific, and priorities for development of gender sensitive dairy value chains will be affected by location. For example, in Degem

woreda in Oromia, where more than 50 percent of milk passes through relatively well-established formal chains, it will be particularly important to facilitate women's access to existing formal institutions, for example, by promoting their participation in cooperative management and their work in processing plants. In areas such as Arba Minch Zuria *woreda* in SNNPR, where informal market chains are very important and formal chains hardly developed, the provision of credit may allow women to establish small businesses in milk sales, processing and in the provision of animal health services, and become part of the process that drives the growth of value chains.

- In addition to promoting equal participation, equality requires ensuring that the economic gains in value chains are fairly distributed among the various value chain actors, including men and women, with consideration for the level of effort and risk that the actors assume. Dairy subsector policy must be adapted to consider gender issues. This applies to policies for the dairy subsector in general and dairy components in particular such as breeding policy, policy change to make land available for producers for forage seed and forage production. One important change would be to remove current legislation and practice that promotes membership of one person per household (a head, usually a man) in cooperatives.

Finally, just as for any development initiative that aims to be gender sensitive, participatory planning and monitoring and evaluation plans need to be put in place in clear terms with smart targets. These should include gender targets such as women and men having equal access to and control over income, credit, land and other productive resources, as well as equal access to goods and services for agricultural development and marketing developed by all key stakeholders.

About the author

Edemo Herego is an experienced expert on gender and value chain development. He holds two Masters of Art degrees, in Development Studies from Addis Ababa University, and in International Law from Amsterdam University Law School, Netherlands. He is a Certified Business and Development Consultant and owner and Managing Director of a consultancy firm. Among other areas of expertise include: project planning, management and monitoring and evaluation (M&E); socio-economic research; strategic and business plan development; capacity development, impact assessment; development and food security through the rights-based approach; and policy design on the agricultural sector.

Abbreviations and acronyms

AGP	Agricultural Growth Programme
AGP-LMDP	Agricultural Growth Programme – Livestock Market Development
AHT	Animal Health Technician
ALPPIS	Addis Livestock Production and Productivity Improvement Service
BOAM	Business Organizations and their Access to Markets
CIDA	Canadian International Development Agency
CSA	Central Statistics Agency (Ethiopia)
DDA	Dairy Development Agency
DDE	Dairy Development Enterprise
DLMP	Draft Livestock Master Plan
DVC	Dairy value chain
EAFIA	Ethiopian Animal Feed Industry Association
EDGET	Enhancing Dairy Sub-sector Growth in Ethiopia
ETB	Ethiopian birr
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus group discussion
FINNIDA	Finnish International Development Association
GDP	Gross domestic product
GEWE JP	Gender Equality and Women’s Empowerment Joint Programme
GTP	Growth and Transformation Plan
ILO	International Labour Organization
ILRI	International Livestock Research Institute
IPMS	Improving Productivity and Market Success
LIVES	Livestock and Irrigation Value Chains for Ethiopian Smallholders
LMD	Livestock Market Development
Lo’L	Land O’Lakes Inc.
MoARD	Ministry of Agriculture and Rural Development
NPWE	National Policy on Ethiopian Women
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
RAO	Regional Agricultural Office
SDDP	Small Dairy Development Project
SNNPR	Southern Nations, Nationalities and Peoples Region
SNV	Netherlands Development Organization
UNIDO	United Nations Industrial Development Organization
UNRRA	United Nations Relief and Rehabilitation Administration
USAID	United States Agency for International Development
VAT	Value added tax
WAO	Women’s Affairs Office

Approximate exchange rates at the time of analysis:

US\$1 = ETB20.50 (Ethiopian birr)

Chapter 1

Introduction

FAO has a long history of working in small-holder dairy development and has learned that well-designed dairy development programmes can improve the incomes and nutrition of poor households, as well as providing employment in milk processing and marketing (Dugdill *et al.*, 2014). Demand for dairy products has grown steadily and continues to grow, particularly in the urban centres of developing countries (McLeod, 2014). Small-scale dairy production is considered beneficial to women and children as well as men. Milk sales provide regular income that is often accessible to women, while dairy products can be important in diversifying the diets of poor people, in particular children above the age of 12 months and undernourished pregnant women (Weaver *et al.*, 2014).

However, reviews of evidence on the importance of livestock for women (Kristjanson *et al.*, 2014) have argued that, even though two-thirds of the world's poor livestock keepers are rural women, limited research has been conducted in recent years on their roles in livestock keeping and the opportunities livestock-related interventions could offer them. Some published literature is available on gender and livestock ownership; for example, livestock has been described as an asset that women can sometimes acquire or control more easily than land or other physical or financial assets (Rubin, 2010), although the relative informality of livestock property rights can be disadvantageous to women

when their ownership of animals is challenged. It is also more common for women to own livestock jointly with men than to have sole ownership of them, according to recent surveys in eight countries (Johnson *et al.*, 2016). However, income from livestock can be advantageous to women even if they do not solely own the animals; participation in a dairy value chain programme in Bangladesh, for example, increased the value of assets jointly owned by women and men, and gave women a wider range of options in saving or accessing credit (Quisumbing *et al.*, 2013).

This report is one of four studies commissioned by FAO to review gender and socio-economic aspects of dairy value chains that involve small-holder producers.¹ The aim was to assess the extent to which gender inclusion can be built into the development of dairy value chains in Ethiopia and to formulate recommendations accordingly. The analysis assesses women and men's roles and responsibilities, their different needs, constraints and challenges along selected dairy value chains. Also, it identifies the contributing factors to reversing gender inequalities and draws general guidelines on how to design and implement gender sensitive dairy value chain development.

The assessment was conducted by a national consultant under the overall supervision of an international consultant and the FAO ESP team in Rome, and with collaboration from the FAO Representation Office in Ethiopia.

¹ A 2013 study in Afghanistan is reported in FAO (2015). Subsequently, FAO commissioned three further studies, in Ethiopia (reported here), Kenya and Rwanda.

Chapter 2

Methodology

2.1 SCOPE

The aim of the study is to assess the extent to which gender equality can be mainstreamed into the development of dairy value chains in Ethiopia and to recommend general guidelines for implementing a gender sensitive dairy value chain. It examines several aspects of dairy value chains, namely structure, governance, value addition and profitability. However, the aim of this analysis is not to evaluate the performance of the value chains, but rather to investigate the conditions that are necessary to provide equal opportunities for women and men to engage in and benefit from dairy value chain development.

The study uses a literature review to present a broader picture of dairy development and its economic, social and gender context. It draws information from previous descriptions and evaluations of dairy value chains and dairy development projects, as well as field work conducted in Ethiopia.

2.2 ANALYTICAL FRAMEWORK

Given that the study is concerned with gender issues within the value chains, the conceptual framework draws from and combines two types of analysis: gender analysis and value chain analysis.

Value chain analysis is concerned with the effective and efficient functioning of value chains and their potential to provide profit to those who participate. Gender analysis is concerned with the extent to which men and women have equal access and control over resources and assets, voice and agency, and/or have equal opportunities to attain their chosen life outcomes. In this study, gender analysis considers the factors within the value chain and in the wider environment that affects the extent to which both men and women can participate in and benefit from the operation of dairy value chains. Combining the two, gender analysis provides a context and cultural reference in which to situate value chain analysis.

The framework was constructed with reference to sources on value chain approaches/analysis;

sources dealing with gender analysis; and sources describing ways to combine the two (Kaplinsky and Morris, 2003; Bolwig *et al.*, 2008; Farnworth, 2011; Mayoux and Mackie, 2008; Quisumbing *et al.*, 2013; ILO, 2009; Vanderschaeghe and Lindo, 2008; Riisgaard *et al.*, 2010; FAO, 2001). It also draws on experiences gained in another FAO study in Afghanistan (Boros and Mcleod, 2015). It aims to be comprehensive and straightforward to apply within a limited time and across a range of local situations.

The framework considers three aspects of the value chains:

- structure, taking into consideration both the functional links and the supporting inputs and services (such as animal health services, extension advice and vet drug and feed supplies);
- flow of values along the chains and the distribution of income among actors
- governance of the chains, i.e. the way that actors and institutions drive their operation.

It also considers gender issues, defined as access and control over resources and assets, voice and agency, at three levels:

- Micro-level. This focuses on individuals, households and local communities, women's and men's roles and responsibilities.
- Meso-level. This focuses on institutions and services and who has access to them, and how they cater to the needs of women and men.
- Macro-level. This focuses on national policies and plans, the economy and social issues as well as how these affect women and men.

2.3 DATA AND INFORMATION GATHERING

A literature review on smallholder dairy development and associated gender issues was the starting point of the analysis. Then, key stakeholders from government institutions and donor agencies were interviewed, focus group discussions (FGDs) were

conducted in three selected communities, and households and individuals participating in the dairy value chains interviewed.

Available published and grey literature was scanned for information on all topics identified. The review was the main source of information on the following topics, although not limited to:

- macro-level information on policies, laws, economic, social and gender indicators, production and consumption of dairy products;
- a history of dairy development programmes and projects, their reviews, and their approach to gender inclusion.

It also provided information on the location of dairy producers needed for the selection of communities in which to carry out FGDs.

Interviews at three field sites were conducted to elicit detail on topics not well covered in literature and to listen to the stories of women and men involved in dairy value chains within the limited time available for the work. The study emphasized depth rather than breadth of coverage and therefore applied more of a qualitative than a quantitative approach to data gathering. Three communities were chosen to represent a range of experiences and lessons learned with smallholder dairying relevant to the study.

The following were the general criteria in choosing study sites:

- **Recognizable dairy value chains.** The study focused on recognisable dairy value chains, meaning that production and processing and/or sale of dairy products had to take place on separate premises.
- **Geographical representativeness:** The study reflects the concentration of dairy value chain development within the country, with an appropriate balance of peri-urban and rural study sites so as to capture the different demand patterns, availability of feed resources, access to animal health services, and cultural norms.
- **Cultural representativeness:** The sample covers communities/households from a range of ethnic groups participating in dairy value chains, recognizing that gender norms can be affected by ethnic group.

Three study sites were selected in three different regional states. The selected study sites and justification for the selection are depicted in Table 1 and their locations shown in Figure 1.

Field work consisted of:

- FGDs conducted with selected value chain actors and supporters. Three groups (one men only, one women only and one mixed) were organized at each study *woreda*/site. The discussions were moderated by the national consultant and assisted by a notetaker. In total, 98 people participated in FGDs, of whom 37 percent were women.
- Household/individual interviews held with 31 individuals including dairy cow owners, milk traders, drug shop owners, animal health technicians and small-scale milk processors. The interviews, which involved 22 men and 9 women, aimed to solicit information about intra-household decision-making, the use made of dairy income, access to and control of profits by women and men.
- In-depth key informant interviews were held with 56 individuals (with 49 men and seven women) in Addis Abeba and at the study sites. The key informants represented government ministerial/agencies and offices (livestock; women, child and youth affairs; cooperatives promotion), research institutions, development agencies, NGOs (implementing related projects), dairy processing enterprises and cooperatives, milk traders, input suppliers and supermarkets. Annex 1 provides a summary. The reason for the small number of women key informants was that the majority of the management and expert positions in the target offices were held by men.
- Five case studies were conducted on small-scale milk processing enterprises (a milk trader, a drug shop, a private animal health clinic and a tsetse fly control and prevention project), which included enterprise budgets.
- Direct field observation was undertaken in milk processing enterprises/cooperatives, homes of dairy cow owners, fields where animal feeds grown, etc., and pictures were taken to record observations during the field visits.

2.4 DATA ANALYSIS

The data and information were compiled, triangulated, verified, analysed and summarized systematically.

Text analysis of notes from key informant interviews, focus group discussions, household/individual interviews and field observations, which sought to identify individual or group similarities and differences by noting major themes that emerged from interview notes and observations. Enterprise budgets were prepared using Micro-

TABLE 1
Study sites and justification for the selection

Region	Sites	Justification and context
Oromia	North Shoa Zone Degem <i>woreda</i>	<ul style="list-style-type: none"> ▪ Widespread and long history in dairying practices ▪ A high potential for dairying ▪ The presence of households engaged in dairying activities as a main income source ▪ The presence of formal dairy value chains (DVCs) ▪ The presence of multiple marketing channels ▪ The presence of cooperative-based and private processors ▪ Accessibility and short distance from Addis Ababa
Amhara	East Gojam Zone Dejen <i>woreda</i>	<ul style="list-style-type: none"> ▪ Widespread and growing dairying practices ▪ A high potential for dairying ▪ Existence of households engaged in dairy as a main income source ▪ The presence of formal DVCs ▪ The presence of cooperative-based and private processors ▪ Accessibility and the short distance from Addis Ababa
South Nations Nationalities and Peoples	Gamu Gofa Arba Minch Zuria <i>woreda</i>	<ul style="list-style-type: none"> ▪ High prevalence of animal diseases and effect of vectors such as the tsetse fly ▪ Existence of a livestock rearing tradition ▪ Weak formal DVCs ▪ Weak cooperative engaged in collection and distribution

FIGURE 1
Study sites – Dejen, Degem and Arba Minch Zuria



soft Excel. The quantitative information obtained from this and secondary sources are analysed with Microsoft Excel and presented in percentages, case studies and tabular forms.

Chapter 3

Findings

3.1 DAIRY DEVELOPMENT CONTEXT

3.1.1 Economic, social, gender and institutional context

Economic and poverty context

Ethiopia is one of the lowest GDP per capita countries in the world, ranked by the World Bank as a low-income economy. According to World Bank, 2014, per capita GDP in current prices is US\$573, with a purchasing power parity (PPP) GDP of US\$1 499.

The country's current per capita GNI of US\$550 is substantially lower than the average for sub-Saharan Africa, at US\$1 646 (World Bank, 2014). The share of the population of Ethiopia living below the poverty line was 27.8 percent (CSA, 2012), as measured by the national poverty line at less than US\$0.6 per day. According to World Bank figures for 2010, 33.5 percent of the Ethiopian population lived below the absolute poverty line of \$1.90/day. (World Bank Group, 2016).

Ethiopians consume less dairy products than other African countries and far less than the world average consumption, although consumption has grown in the past ten years. In 2011, consumption in Ethiopia was approximately 39 kg/person/year while the world average consumption was approximately 90 kg. The food supply includes milk produced in the country as well as imported dairy products (also discussed in 3.1.2 and shown in Figure 3). The recommended per capita milk consumption by the World Health Organization (WHO) is 200 litres/year (Felleke, Woldearegay and UNIDO, 2009). Ethiopians regularly consume other dairy products such as butter, *ayib* (cottage cheese) and fermented milk. According to the Central Statistics Agency (CSA, 2005), only 15.4 percent of the milk produced is sold in the market, whereas 54.7 percent is consumed at home as liquid milk, while 29.5 percent is converted into butter and *ayib* using traditional processing technologies.

There are differences in the demand for milk between rural and urban populations. In rural areas,

the demand is mainly for fresh whole milk, and it is partially satisfied by home production and/or purchased from neighbouring producers. The demand for commercially processed milk in the rural areas is, in contrast, very low (Tamconsult, 2008).

Seven percent urban population, or 4 million people, is the potential market for surplus milk that will have to be processed. Of this market, 65 percent is in Addis Ababa and the surrounding districts. The main demand will continue to be fluid, much of which will be supplied through informal channels. In rural areas, consumption of milk and milk products is heavily influenced by livestock ownership, but in the urban areas, in particular, the principal determinants of consumption levels are income and consumption behaviours. There has been growth in demand resulting from a rapidly growing population, urbanization, change in lifestyle and consumption behaviours, and some increase in per capita income (Tamconsult, 2008). According to a study conducted by the Agricultural Growth Programme – Livestock Market Development (AGP-LMDP, 2013), various factors depress demand for dairy products. Many middle- and low-income consumers cited in the study stated that the price of milk was increasing rapidly and that they were finding it increasingly difficult to purchase milk and milk products. Approximately 92 percent of the cafeterias/hotels and over 91 percent of consumers covered in the AGP-LMDP survey stated that the very high price of dairy products is a major challenge.

The Domestic End Market Analysis cited in AGP-LMDP (2013) and Tamconsult (2008) indicated the following reasons for low milk consumption:

- § The fluctuation in the demand of milk and other dairy products is in line with the various fasting periods observed by Orthodox Christians, which covers more than 200 days in a year. Producers and processors have trouble responding to uneven demand and lower prices during these periods.

- § In many parts of Ethiopia, milk is traditionally considered a food item that is essential only for children and convalescent persons. Its nutritional benefits for adults tend to be overlooked.
- § There is inadequate marketing, cooling, bulking, processing infrastructure and market information for traders and dairy industry actors. The limited processing facilities and their concentration in and around Addis Ababa result in inequitable consumption, because there is not enough packaged milk for non-milk producing areas. Milk marketing is also affected by poor quality and inconsistent flow of inputs such as feed, breeding stock and equipment for the dairy industry.

However, the AGP-LMD study argues that the effect of fasting periods on dairy products' demands and prices may not be as extreme as is often described, and may be diminishing. It also considers that children under ten years of age, pregnant women, and the non-Orthodox populations (nearly 50 percent of Ethiopia's population) are not expected to avoid consuming milk products during fasting periods.

The findings of this study with regard to the impact of the fasting period on demand and prices of dairy products are in line with those of the Domestic End Market Analysis and differ from the AGP-LMD findings. Producers and processors from three sites interviewed in this study unanimously agreed that fasting periods have a negative impact on the demand and prices of dairy products. According to focus group participants in Degen and Dejen *woredas*, who supply to cooperatives or private milk processors, demand for their milk decreases by 50 percent during fasting periods since they are requested either to supply half of their products on a daily basis, or supply produced based on a quota system every other day by their buyers. Based on the same source of information, the prices for fresh milk also decline by 18-30 percent on average during fasting periods.

Although consumption per capita is low and seasonal demand is problematic for suppliers, there is a growing national demand for milk that cannot be met from domestic production. While supply grew by 160 percent between 2003 and 2013 (FAOSTAT production database), and imports of dairy products have decreased compared to earlier decades (see 3.1.2), growth was from a very low base, and Ethiopia still imports

between 2 000 and 4 000 tonnes a year of milk, butter and cheese (FAOSTAT trade database).

Contributions of dairy cattle to the economy

Ethiopia has the largest livestock population in Africa. According to estimates based on the 2010 report of the Central Statistical Agency (CSA), the cattle population was about 52 million. Indigenous breeds accounted for 99.19 percent, hybrid breeds, 0.72 percent and pure exotic breeds, 0.09 percent (CSA, 2010-2011; Lo'L, 2010; MOFED and MoARD 2011; AGP-LMDP, 2013). Ethiopia produces approximately 3.2 billion litres per year from 10.5 million milking cows. The farm-level value of the milk is an estimated 16 billion ETB per year (Lo'L, 2010, Kitaw *et al.*, 2012; AGP-LMDP, 2013).

The dairy sub-sector accounts for 30-35 percent of the national agricultural output and 40 percent of agricultural export MOFED (2008). In 2008, the livestock sector as a whole contributed about 12-16 percent of national GDP, 15 percent of export earnings, and 30 percent of agricultural employment (Tamconsult, 2008). However, more recent data by the Ministry of Agriculture and Rural Development (MoARD) indicated that livestock sector contributes 45 percent of agricultural GDP (MoARD, 2015). Livestock provides a safety net, which helps prevent poor households from falling into poverty.

According to published reports, Ethiopia has a huge untapped potential for market-oriented development of smallholder dairy production (Tamconsult, 2008; Kitaw *et al.*, 2012; Geleti, 2014). Its agro-ecology, particularly of the mixed crop-livestock systems in the Ethiopian highlands, is considered conducive and relatively disease-free to support crossbred dairy cattle (Ahmed, Ehui and Assefa, 2004). However, despite this substantial potential, the dairy sub-sector is not well developed. For a number of years, the annual growth rate in milk production of 1.2 percent lagged behind the annual human population growth estimated at 3 percent (GRM International BV, 2007 cited in Lo'L, 2010), although recently milk production has grown more rapidly. The traditional milk production system, which is dominated by indigenous breeds of low genetic potential for milk production, accounts for about 97 percent of the country's total annual milk production (Lo'L, 2010). The productivity of the national dairy herd is low, and costs of production are high.

In Ethiopia today, the dairy market is less developed than in neighbouring countries with

similar agro-climate conditions, such as Kenya and Uganda, although smallholders dominate dairy production in all three countries and all have parallel formal and informal marketing systems.

Cultural and gender context

Livestock, one of the largest non-land assets in the rural asset portfolios, is widely owned by rural households and performs multiple functions (ILRI, 2013). Many Ethiopians in rural areas own cattle, which serves as a source of income, household nutrition, ploughing force and manure.

According to Yilma *et al.* (2011), the importance of milk in the diet of Ethiopians differs according to the farming systems and the socio-cultural set-ups. In the lowlands, especially where livestock keeping is the main occupation, milk is consumed by all groups of society. In the highlands, the rural people raise both livestock and crops, with their diet consisting mainly of cereals and legumes. Milk is used for rearing calves and children, while the surplus is processed for yogurt (*ergo*) and/or butter and local cheese (*ayib*). *Avera* (butter-milk) is used for human consumption or for *ayib*- (local cheese) making. Generally, milk consumption in rural areas can be considered a sign of the wealth of a given household, and of the availability of milk for the household. In addition, in urban areas, milk consumption can be determined by the purchasing power of the household, the level of awareness on its nutritive value and its availability.

This study found that in Ethiopia, men and women are involved in dairying, but in different ways, and they face different constraints. As sections 3.2 to 3.4 explain, it is women who are most involved in managing dairy cattle. They also play a role in processing and sale of dairy products and in provision of animal health services. However, they are impeded by the low position they hold in the family and in society (Send a Cow, 2009).

In 2013, Ethiopia ranked 126 in the world in the Gender Development Index (GDI), with a female to male Human Development Index (HDI) ratio of 0.853 (in the top 30 countries, the ratio was 0.98 or higher). It ranked 121 on the Gender Inequality Index (GII) with a score of 0.547 (in the top 30 countries, the score is 0.154 or less). According to the Global Gender Gap Index (2015), Ethiopia ranked 124 with a score of 0.640, an improvement from 2014 when it ranked 127 with a score of 0.614. Furthermore, in 2014, Ethiopia was ranked 173 in the HDI, 129 in the GII and 174 in the GDI (UNDP, 2015). Nevertheless, the Government of Ethiopia is com-

mitted to achieving gender equality giving this objective specific attention in its constitution and policy initiatives such as the Agriculture and Rural Development Policy (AGP-LMDP, 2013).

Gender related policies and programmes

Ethiopia has adopted a range of sectoral and general policies that emphasize the critical role of gender, including:

- The National Policy of Ethiopian Women (1993)
- The Constitution (1995)
- The Development and Social Welfare Policy (1996)
- The Education and Training Policy (1994)
- The Health Policy (1993)
- The Culture Policy (1997)
- The National Population Policy (1997)
- The Natural Resource and Environmental Policy (1997)
- The Agricultural Development and Industrialization Strategy (2001)
- Revisions to the Family Law (2004) and the Criminal Code (2005)
- Women's Change and Development Package (2006)
- National Action Plan on Gender and Development (2006-2010)
- Growth and Transformation Plan (GTP) (2010-2015)
- Development Plan for Women and Children (2011-2028).

The gender content of selected policies is summarized below.

National Policy on Ethiopian Women: This policy was adopted in 1993 with the aim of institutionalizing the political, economic and social rights of women by creating an appropriate structure in government offices and institutions so that the public policies and interventions are gender-sensitive and can ensure equitable development for all Ethiopian men and women (MOWA, 2010; Ogato, 2013; Jones, Gupta and Tefera, 2015).

Furthermore, the Government expressed its commitment in the policy to abolish all discriminatory laws and regulations as well as create an enabling environment for the full participation of all members of society in the socio-economic and political sectors, with a special focus on the subordinated position of women (MOLSA, 2012).

Constitution: The Constitution was adopted in 1995 and included the fundamental rights of women and aims to protect their access to and

control over resources. Regarding property and land rights, the Constitution states that women shall acquire, administer, control, use and transfer property. In line with the Constitution, new policies and programmes have been formulated and adopted with increased gender consideration and equality. Consecutively, Ethiopian women are entitled to remedial and affirmative measures to enable them to compete and participate on an equal basis with men in the political, economic and social life (MOLSA, 2012; Ogato, 2013).

Women's Change and Development Package:

This package was introduced in 2006 with the aim of facilitating the implementation of the National Policy on Women and stresses the equal participation of women in all sectors (MOWA, 2010; Jones, Gupta and Tefera, 2015). Furthermore, it aims to facilitate the mobilization of women and enhancing their participation and benefit from economic, social and political activities.

National Action Plan on Gender and Development (2006-2010): This Plan was prepared to promote the implementation of Ethiopia's commitment to the Beijing Platform for Action (MOWA, 2010; UN Women, 2014). The Plan was later included in the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) and currently in GTP.

PASDEP was one of the main implementation strategies designed to achieve gender equality in all national development goals. PASDEP has twin goals of reducing poverty and ensuring gender equality.

Growth and Transformation Plan (GTP) 2010-2015: This five-year national development plan was adopted with fundamental pillars on

women and youth empowerment. It comprises specific commitments to increase women's participation in political life and decision making, promoting women's economic empowerment and reducing violence against women (JP GEWE, 2012-2015; Jones, Gupta and Tefera, 2015). To ensure gender equality the plan has a clear strategy for gender to be mainstreamed by all sectors and has also created accountability on the implementation of the strategy in addressing gender issues (MOLSA, 2012).

Development Plan for Women and Children (2011-2028). The plan comprises specific commitments to increase women's participation in political life and decision making, promoting women's economic empowerment and reducing violence against women as GTP (JP GEWE Pro doc, 2012-2015);

Woreda-based Core Plan: This was developed to harmonize and align planning, implementation, resource, monitoring and evaluation and reporting (one plan, one budget, one report) at the *woreda*, zonal regional and federal levels (MOWA, 2010).

The Labour Proclamation and the Civil Servants Proclamation: These proclamations prohibit discrimination and encourage affirmative action in recruitment, training and promotion; and protect pregnant women and maternity rights (MOWA, 2010; JP GEWE Pro doc, 2012-2015).

The Revised Family Law: When revised in 2004, it established a new standard for equality between women and men (MOWA, 2010; UN Women, 2014; JP GEWE Pro doc, 2012-2015).

The revised Criminal Code: This Code was revised in 2005 in harmony with international and regional instruments. It has served as a landmark

International conventions, protocols and treaties

- Convention on the Political Rights of Women (CPRW) of 1953;
- Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW 1979), entered into force as an international treaty in 1981;
- Declaration on the Elimination of Violence Against Women (DEVAW, 1993);
- International Conference on Population and Development (ICPD, 1994);
- International Labour Standards such as Convention No. 100 (Equal Remuneration and Discrimination) and Convention 111 (Employment and Occupation), which promotes women's rights have been ratified;
- The principles enshrined in the 1995 Beijing Platform for Action (BPA) as well as the Beijing +5 Political Declaration and Outcome, of 2000;
- The Millennium Development Goals, which outline gender-sensitive commitments with specific targets;
- The African Charter on Human and People's Rights, of 1998.

for gender equality and criminalizes domestic violence, rape, female genital mutilation, abduction and early marriage (MOWA, 2010; UN Women, 2014; JP GEWE, 2012-2015).

In addition to national policies, the Government of Ethiopia has adopted or endorsed most major **international conventions, protocols and treaties** related to women and gender equality (Ogato, 2013; UN Women, 2014; JP GEWE Pro doc, 2012-2015; Jones, Gupta and Tefera, 2015). The 1995 Constitution states that these instruments are an integral part of the law of the land.

JP GEWE (2012-2015) noted that there are adequate policies in place to protect women's rights; however, their implementation remains a challenge. Laws and policies have not been disseminated adequately among society in general and women in particular: low awareness on the policy and legal provisions and various socio-cultural factors hamper the protection against discrimination. Enforcement of the laws and policies on discrimination against women need to be further improved.

Gender machineries

The 1993 National Women Policy underlined the need for an institutionalized strategy for women's empowerment through policy frameworks and gender equality structures within the Government (MOWA, 2010; UN Women, 2014). Based on the policy, national women's machineries have been established at all levels: federal, regional, zonal and *woreda* levels, as follows:

- The Women's Affairs Office was set up in 1991, within the Prime Minister's Office, to coordinate the implementation of the National Policy on Ethiopian Women (NPWE) (WAO, 2005 in Sosen and Tsehay, 2008; UN Women, 2014).
- The Women's Affairs Departments (WADs) were created as local implementation instruments in government ministries and agencies, while Women's Affairs Bureaus (WABs) were set up to implement the NPWE from the regional to the *woreda* level as well as Women's Affairs Units at the *kebele*² level (WAO, 2005 in Sosen and Tsehay, 2008; UN Women, 2014).

- A National Committee on Gender Equality (NCGE), set up to implement the National Action Plan on Gender Equality (NAP-GE) 2002-2006, including representatives of WADs, WABs, international organizations, national NGOs, registered women groups, associations and donors.
- In 2006, the Women's Affairs Office (WAO) was upgraded to the Ministry of Women's Affairs (MoWA). It was renamed as Federal Ministry of Women's Children's and Youth Affairs (MOWCYA) in 2010, and the Ministry of Women's and Children's Affairs (MOWCA) in 2015. It is delegated with the responsibility of planning, coordinating and facilitating programmes that allow women to contribute to and benefit from the country's development process (UN Women, 2014; JP GEWE Pro doc, 2012-2015; Jones, Gupta and Tefera, 2015). It is also responsible for creating a conducive environment for the implementation, monitoring and evaluation of the women's policies and programmes in various government and other organizations.

The 1993 Ethiopia Women Policy, the 1995 Constitution and subsequent legal frameworks and programmes that followed the legal reforms focused on gender equality and women's empowerment, which has created an enabling environment for the promotion of gender equality and the emergence of various types of women's organizations. Development and poverty reduction programmes such as the Sustainable Development and Poverty Reduction Programme (SDPRP) have included, among others, harmful traditional practices (HTPs) in terms of public awareness, consultations with the community to enable women and girls to benefit from development, and foresees the strengthening of the legal environment (Ogato, 2013).

However, Ogato (2013) and the Gender Equality and Women's Empowerment Joint Programme (JP GEWE 2012-2015) observed limitations in gender equality and women's empowerment efforts. According to these reports, there is an inadequate assessment of women's roles and responsibilities, particularly in the rural community, as well as of their access to and ownership of resources, and a lack of focused analysis of policy document on the serious implications of the low involvement of women in the decision-making positions. The reports further argued that gender has not been considered a factor in poverty reduction documents. Ogato (2013) further observed

² The *kebele* is the smallest administrative unit of Ethiopia similar to a ward, a neighbourhood or a localized and delimited group of people.

that although SDPRP acknowledges the need for gender sensitivity in the education and health policies and programmes for equitable development and poverty reduction, it does not directly state the importance of women in decision-making to poverty reduction.

The Ethiopian Women Policy of 1993 laid the ground for establishing networking and coordination among gender machineries. Based on UN Women (2014), the following are currently the main coordination mechanisms:

- **Horizontal coordination:** The Gender Forum with women's machineries of the federal sector ministries, together with their heads; government institutions and their executive organs, including the judiciary and development partners such as United Nations agencies, was established in 2010 with the aim of creating opportunities for sharing experiences and lessons.
- **Vertical coordination:** There is a quarterly meeting of MoWCA with its corresponding structures in the regions – Bureaus of Women Children and Youth Affairs (BoW-CYAs) and grassroots women's associations. The meetings aim at joint planning around thematic areas of focus, and monitor and evaluate performances.
- **Annual Women's Conference:** The Conference serves as a forum that brings together all the federal, regional, United Nations agencies, non-governmental organizations (NGOs) and development partners. In order to discuss on achievements, challenges and best practices and to develop strategies on gender equality and women's empowerment.
- **Government organizations and NGOs Forum (GONGOF):** This Forum was established in 2012 with the aim of coordinating and aligning activities on gender equality and women's empowerment by different stakeholders.
- **Women's Forum in the legislative body:** This is a women's parliamentary forum at the national level and a women's standing committee forum that comprises members of Women's Standing Committees in the Federal House of Representatives and in the regional councils. The forum aims to share experiences and lessons.

Dairy-related policies and institutions

The dairy sub-sector is developed as part of the Growth and Transformation Plan (GTP 2011-

2015), the agricultural development-led industrialization strategy (ADLI), the Comprehensive Africa Agriculture Development Programme (CAADP) and the Agricultural Growth Programme (AGP-LMDP, 2013).

National policies directly affecting the dairy sub-sector include the following (Tamconsult, 2008):

- Livestock Development Policy
- National Veterinary Policy
- Animal Disease Act
- Cattle Breeding Policy
- Dairy Industry Act
- Public Health Act.

In addition, the Ethiopian Government provides fiscal incentives to encourage investment in dairy production, which include equity restrictions (obligation of local partners, foreign ownership of agricultural land), incentives for investors (duty and VAT exemption on machinery, equipment and raw materials, tax holidays, liberal depreciation rate, loss-carry forward), which may encourage investment in dairy processing, among others (Send a Cow, 2009).

Many government organizations play important roles in the dairy value chain (AGP-LMDP, 2013).

The Government of Ethiopia has developed and is implementing many policies, strategies, regulations, standards and programmes that are important to the dairy sub-sector. As yet, however, there is no livestock or dairy policy.

In the private and non-governmental sector, there are also numerous actors and institutions that have importance for the industry. Main examples include:

- Non-governmental organizations and their programmes
- Business and professional associations:
 - Ethiopian Milk Producers and Processors Association (EMPPA)
 - Ethiopian Dairy Cattle Breeders Association
 - Ethiopian Animal Feed Industry Association (EAFIA)
 - Ethiopian Chamber and Sectoral Association
 - Ethiopian Society of Animal Production (ESAP)
 - Ethiopian Veterinary Association (EVA)
 - Ethiopian Assistant Veterinarians Association (EAVA)
 - Ethiopian Agricultural Professionals Association (EAPA).

AGP-LMDP (2013) argued that although these associations offer valued services, in many cases, they have not yet been strong vehicles for realizing a value chain vision, consensus or effective engagement with the public sector or other partners. There are few platforms for private-private or public-private dialogue and decision-making, and there are few collaborative platforms for the collaboration of dairy value chain actors for their mutual benefit. There is no representative, industry-wide forum for the dairy industry, although recent Multi-Stakeholder Platform Workshops (MSP) initiatives are promising, and there was attempt towards the creation of a Dairy Board/Council.

Aregu *et al.* (2010) observed that livestock sector policies do not explicitly take into account gender issues; rather, these issues are addressed by PASDEP, which was launched in 2005 to safeguard rights such as access to land, credit, and other productive resources, and to protect women from other deprivations, such as longer working days, violence and discrimination. The Federal Rural Land Administration Proclamation, also from 2005, addressed women's landholding rights.

Cooperative policy and institutions

Traditional cooperatives/associations existed in Ethiopian society centuries ago in the form of an *iqub* and *idir*. *Iqub* is an association of people having common objectives of mobilizing resources, especially finance, and distributing it to members on rotating basis. *Idir* is an association of people whose objective is to provide social and economic insurance for the members in the events of death, accident, damages to property, among others. In the case of funerals, *Idir* serves as funeral insurance where community members elect their leaders, contribute resources either in kind or in cash, and support the mourning member.

Cooperatives have also been integral to government policies for many years (Emana, 2012). The socialist government (1974-1991) practised a principle of communal ownership using cooperatives. The current government has also included cooperatives as a means to organize and develop the societies. All of the following strategies acknowledge that cooperatives play key roles:

- Agricultural development-led industrialization (ADLI) strategy (1995)
- Sustainable Development and Poverty Reduction Programme (2002-2004)
- Food Security Strategy (2004-2006)
- PASDEP (2006-2010)
- Growth and Transformation Plan (2011-2015).

As the following sections will demonstrate, cooperatives have an important part to play in dairy value chain development. However, this study found that the the extend of women's participation in dairy farmer organizations, including cooperatives, was generally poor (see section 3.2.1, in particular), and there is little in current cooperative policy to change this situation.

The history of formal cooperatives backed by government policy dates back to 1960, when the first directive of cooperatives was enacted. Since the introduction of the cooperative directive, Ethiopia has enacted several proclamations and an amended act (ILO, 2009; Emana, 2012). In two previous government regimes, policy was geared towards the direct control of the cooperatives. The current government has also issued policies, strategies and proclamations regarding cooperatives. The latest proclamation ensures that cooperative policy is fully consistent with the Universal Cooperative Principles and the International Labour Organization's (ILO) Promotion of Cooperatives Recommendation 193 (2002) (ILO, 2009).

There are four tiers of cooperatives, namely the primary cooperative, the cooperative union, the cooperative federation and the cooperative confederation. The cooperative union is the apex in many regional states. However, there are motivations for the regional governments to establish Regional Cooperatives Federations. The Southern Nations, Nationalities and Peoples Region (SNNPR) of Ethiopia established the first Regional Farmers' Cooperatives Federation in the country, which became operational in early 2009. The Oromia Region has also just recently formed the Regional Federation of Farmers' Grain Marketing Cooperatives (ILO, 2009).

The cooperative network in Ethiopia is extensive. In 2011, 245 cooperatives involved 5 882 260 members, of whom 23 percent were women. Primary cooperatives, with 6 792 members, had a total capital of US\$125 million (ILO, 2009; Emana, 2012).

Cooperative policy is largely determined by the Government, and the role of cooperative unions in making policies is currently minor, because most of them lack the capacity to make independent decisions. The role of the union as an apex body is likely to increase once its human and financial capacities increase. However, the unions play an important role as service providers (ILO, 2009).

Emana (2012) identified the positive impact of cooperatives, including employment creation, capacity building (for their members, provision

of market links and inputs, and providing voices for their members, including poor members. However, many of them also lack policies, strategies, leadership and management, and have limited finances.

There are opportunities for cooperatives because a weak and exploitative private sector encourages farmers to act in an organized manner. Cooperatives receive support from the government and aid projects to help them develop market opportunities for members.

3.1.2 The history of dairy development

Modern dairying started to develop in the early 1950s, when Ethiopia received 300 Holstein Friesian and Brown Swiss dairy cattle in 1947 from the United Nations Relief and Rehabilitation Administration (UNRRA). This was the first attempt to introduce modern dairy production; the cattle were used to establish dairy farms around Addis Ababa, which are the nucleus herd for the Holeta dairy farm established in 1955. At the same time, the first milk processing facility was established in the form of a small milk boiler and a manual packing facility in Addis Ababa (Tamconsult, 2008; UNIDO, 2009).

The Government also promoted feeding with a high ratio of dairy concentrated feed, modern dairy infrastructure and high management levels to facilitate the growth of the sub-sector (UNIDO, 2009).

The development pace and structure of the sub-sector were highly influenced by major political and structural changes. Three phases are identified in the Ethiopian dairy industry history, corresponding to three government regimes: a free market economic system and the emergence of modern commercial dairying (1960–74), the socialist (Derg) regime that emphasized a centralized economic system and state farms (1974–91), and the current phase of free market and market liberalization (1991 to present) (Ahmed, Ehui and Assefa, 2004; Staal, Nin Pratt and Jabbar, 2008; Tamconsult, 2008; UNIDO, 2009). See Annex 2 for the programmes that contributed to the development of the dairy sub-sector.

Free market (1960-1974)

According to Staal, Nin Pratt and Jabbar (2008), milk production increased by 16.6 percent from 637 400 000 to 743 100 000 tonnes between 1961 and 1974, at an average annual growth rate of 1.6 percent. This growth was largely due to economies of scale in production and marketing, subsidies in transport to the formal market,

secured land tenure and an active free market for feed and other inputs. On a per capita basis, however, milk production declined during this period, at an average rate of 0.87 percent per annum. Processed milk production stagnated in the early 1960s but expanded significantly in the second half of 1960s and early 1970s.

Organized milk collection and processing was introduced mainly in Addis Ababa in the 1960s. Only one milk processing plant was functional in 1960, while processing and distribution in Addis Ababa was run by a government agency, Sholla Dairy, later renamed the Dairy Development Agency (DDA). The processing plant was funded by UNRRA. Milk collection points from smallholder producers were set up around Addis Ababa to feed the processing plant. Raw milk collection was further strengthened and expanded to a seven kilometre-radius from the city. This arrangement attracted a substantial number of smallholder farmers who produced and delivered small amounts of milk from their indigenous cows (Yilma *et al.*, 2011).

The Military Coordinating Committee (Derg) Regime (1974-1991)

To bridge the gap between supply and demand, dairy imports increased significantly beginning from 1978. This was partly due to increased food aid milk powder imports by World Food Programme (WFP). Imports reached a peak of 314 700 000 tonnes in 1986 during the drought period (Tamconsult, 2008). During the period between 1977 and 1989, dairy imports as a percent of total consumption increased from 4.1 percent to 12.8 percent. Commercial imports grew rapidly at 24.2 percent per year (Tamconsult, 2008). Further, it is estimated that imported milk powder accounted for 23 percent of Addis Ababa market. Post-1991 producer groups emerged such as the Addis Ababa Dairy Producers Association (AADPA), encompassing 90 percent of all urban dairy producers and a large proportion of peri-urban producers within a radius of 100 km from Addis Ababa (Staal, 1995, cited by Tamconsult, 2008).

In 1979, DDA became the Dairy Development Enterprise (DDE) under the state farms. The numerous private dairy farms were merged and nationalized. DDE became the only government processing plant that collected all the milk from these farms, and its capacity grew to 60 000 litres per day. Raw milk collection was also extended to cover a distance of about 150 km from Addis Ababa (Yilma *et al.*, 2011).

Market liberalization (1991 to date)

Milk production grew faster in the post-reform period, at an annual growth rate of 3 percent. Per capita milk production grew at a positive but insignificant rate, a reversal of the negative trend in the growth of per capita production during the previous two phases. Using rough estimates from the FAO database and available information from DDE, the contribution of imported milk to total milk consumption declined from 24 percent in 1985 to less than 1 percent in 2000. At the same time, the share of Government-owned enterprises in total milk production decreased markedly. In contrast, the share of smallholder production in total consumption increased from 71 percent to 97 percent (Tamconsult, 2008).

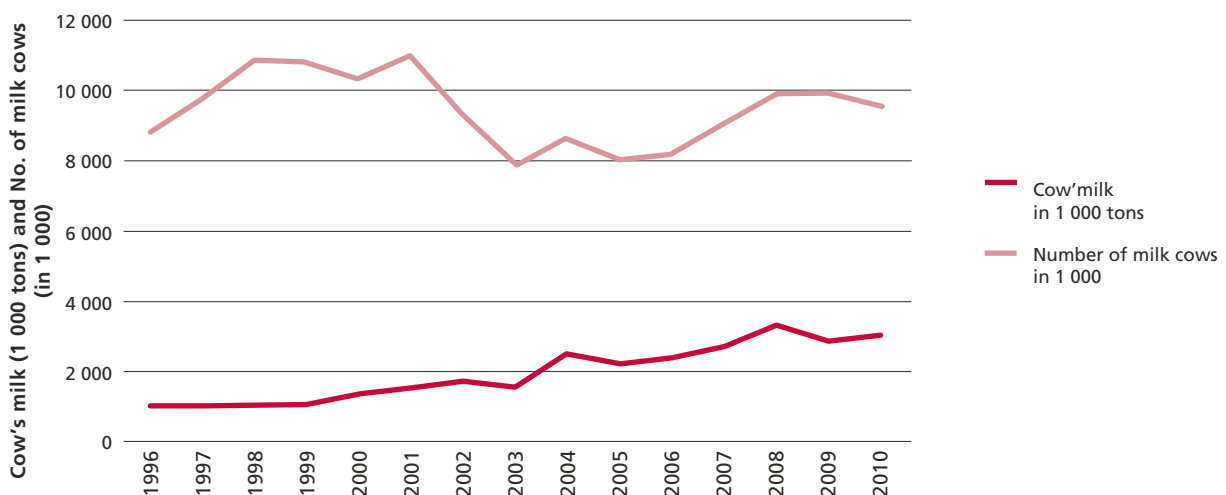
With the introduction of the privatization policy, DDE as well as all farms managed under DDE were sold. DDE, under the new name of Lame Dairy (Sholla), is now a private company, operating with 25 collection centres located around Addis Ababa, 13 of the centres are near Selale, five close to Holetta, and seven around Debre Birhan (Yilma *et al.*, 2011).

In sum, total milk production in Ethiopia has increased during the 1961–2000 period although per capita production declined as a result of the high population growth rate. During the last decade production has grown most rapidly at 3 percent per year. Dairy product imports during this period were relatively smaller than the previous three decades, although Ethiopia continued to import between 2 000 and 4 000 tonnes

of dairy products annually between 2003 and 2013 (FAOSTAT trade database). Most of the growth during the 1990s was concentrated in the peri-urban and rural production systems. The emergence of private processing industries and marketing units have stimulated producers in the peri-urban areas and rural production systems because they offered them a new market for their milk production. The establishment of village milk marketing groups, small-scale dairy associations, and cooperatives in many milk shed areas has also contributed positively to promote milk collection by creating new market outlets for the sale of liquid milk (Yilma *et al.*, 2011).

The number of milk cows at the national level varied between 1996 and 2010, increasing from 8.8 million in 1996 to 11 million in 2001, and sharply decreasing to 7.9 million in 2003, then increasing again to 9.6 million in 2010 (Figure 2). Milk production, however, increased steadily from about 927 million litres in 1996 to 2.9 billion litres in 2010 (31.5 percent increase) (FAO, 2011). CSA (2010–2011) data indicated that the estimated total milk production for the rural sedentary areas of the country is about 4.06 billion litres, with estimated lactation period of six months and average milk yield per cow per day of about 1.85 litres. FAO-STAT figures, all based on official data, suggest a national production of approximately 4.05 billion in 2010, 3.33 billion in 2011 and 3.80 billion in 2012. Although Ethiopia has the largest cattle population in Africa, it is not among the top four milk producing countries in the continent.

FIGURE 2
Number of milking cows and cow milk production trend over 15 years



Source: CSA statistics from 1996 to 2010, in Yilma (2011).

Based on Tamconsult's (2008) analysis, the large number of low productive local livestock population and farming system has constrained the supply of dairy products. Some of the main constraints to the development of intensive dairy production are the multiple functions the cattle, a continued dependency on draft power for ploughing and limited availability of land for grazing or forage production. However, there are other constraints related to fluctuating demand for milk and deficiencies in support services, which are explored in section 3.2.5.

Dairy development at the study sites

Of the three sampled study sites in this survey, Degem *woreda* in Oromia Regional State has the most developed dairy value chain with many households engaged in dairy production. Based on the information from the interviews with community elders, initiation of dairy development in the area dates back to the 1960s during the imperial regime, which is almost the same time as the initiation of the dairy farming in the country. Accordingly, Hamdie Abare Dairy Farm, established in 1960s with imported exotic breeds and Sinar 'oat' (locally known as *Shallo*) feed, was cited as the first private dairy farm in the area. The farm is believed to be a role model for the development of dairying in the area. According to the estimation of the Zone Livestock Office, currently about 60-70 percent of the livelihoods of farming households in eight *woredas* are based on dairy production.

Before 1960, communities in the area used to keep dairy cows for their own consumption because it was believed that if one sells milk, the calf dies and there will not be a second calf. However, in the second half of 1960s and early 1970s, the community gradually started selling milk from local breeds when Sholla Dairy established Gende Sheno Milk collection centre in Ano Degem *kebele* and started collecting fresh milk during the Derg Regime.

For the last half of the 20th century, there has been a concerted effort by the Government and development agencies to improve dairy cattle breeds in the area. According to information from the key informants in the area, it was expanded during Derg Regime with Holstein-Friesian bulls distributed free of charge to model farmers by the Government. The Government provided shared bull services at a charge of ETB2 per cow. Later, bull service centres were established by farmers' associations. To obtain the service, farmers took

their local dairy cows to the centres during their heat periods until they conceived. Herding during this period was performed by hired labourers. Subsequently, artificial insemination services began to be provided by the Government together with the bull service.

Projects such as the Smallholder Dairy Development Project (SDDP) and Smallholder Selale Dairy Development Project (SSDDP) have contributed to the improvement of dairy breeds in particular and to the boom of the dairy business in Degem *woreda* in particular and in Selale area in general. The projects' impact was notable in the improvement of dairy cow breeds, enhanced awareness on quality milk production, and the creation of alternative market linkages for the surplus milk by initiating and supporting the establishment of dairy primary cooperatives and Selale Dairy Union. The material, technical and financial capacity-building support for the dairy cooperatives opened up new market channels for the milk produced in the area that had previously been beyond the collecting capacity of Sholla Dairy (DDE). Based on the data obtained from Zone Livestock Offices, out of the 1.5 million cattle population, 7.4 percent are crossbred, which is considerably larger than the regional average of 1.8 percent (22.9 million dairy cattle) and the national average of 0.81 percent. Based on the same source of data, almost every dairy cow owning households has two or three crossbred cows in their herds in the highland areas of the zone. According to FGD participants' estimation, about 85 percent of community members/farmers in the area are engaged in dairy farming.

In the other study communities in Dejen *woreda* of Amhara Region and Arba Minch Zuria *woreda* of SNNPR, dairy value chains are less developed than in Degem *woreda*. The study communities in both *woreda* have a long tradition of keeping cows to produce milk mostly for home consumption and home-based processing into butter and arera (butter-milk), and sometimes cheese. According to community and cooperative key informants, dairying in Dejen *woreda* was initiated during the Derg Regime and operational in early 1990s when the Government supplied crossbred dairy cows to the farmers. This prepared the ground for the establishment or reorganization of dairy cooperatives such as Yitnora and Gion in the *woreda*. However, dairying is a recent phenomenon in Arba Minch Zuria *woreda*. It is not well developed as a business (i.e. market-oriented production) in either *woreda* because the share of

the population engaged in the dairy sub-sector is no more than 10 percent in Arba Minch Zuria and 6 percent in Dejen *woredas*. Furthermore, according to estimates of the *woreda* livestock offices, the proportion of crossbred dairy cows is about 1 percent, which is similar to the national average.

3.2 BENEFITS AND CONSTRAINTS ALONG THE VALUE CHAIN

3.2.1 Value chain structure

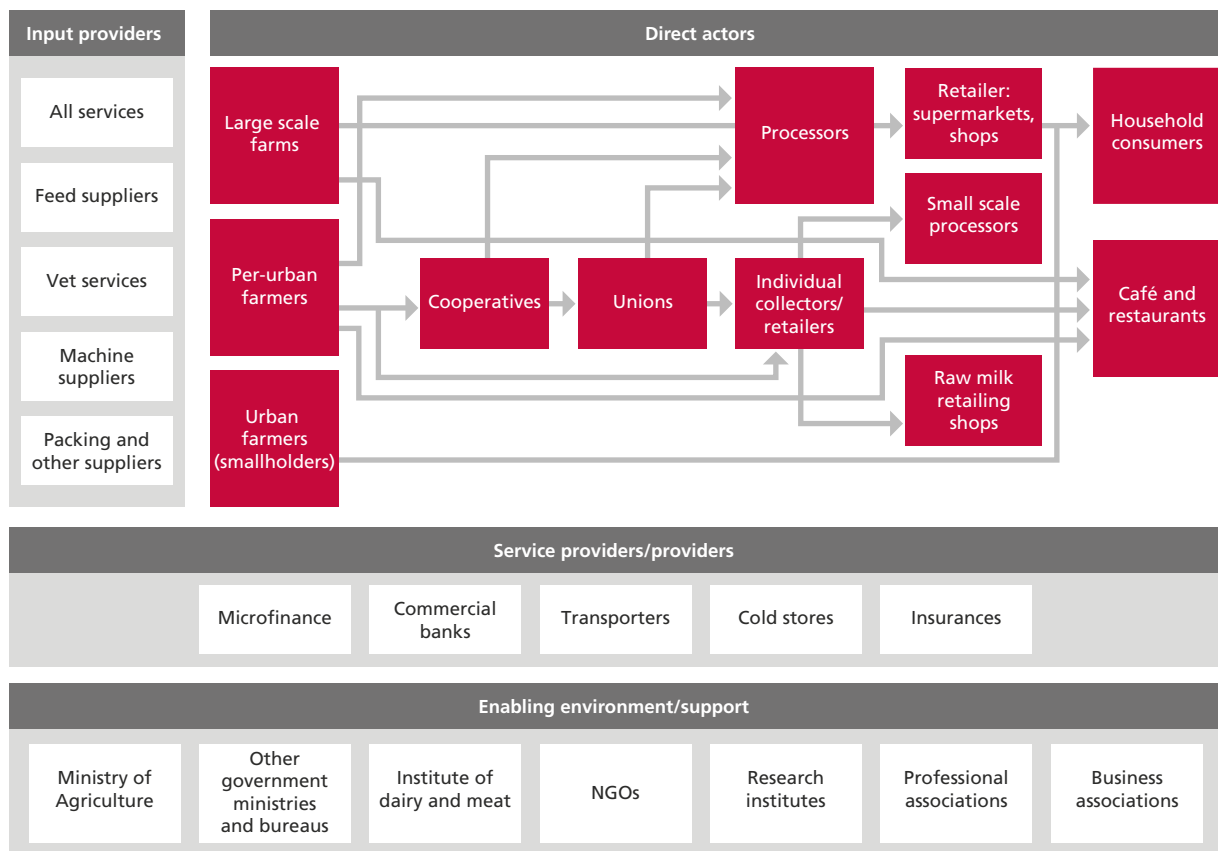
Value chain structure at national level

Published reports show dairy value chains based on the milk produced from three different production systems, large dairy farms, peri-urban farmers, and urban small-scale farmers (Yilma *et al.*, 2011) (Figure 3). The milk produced from these three different sources reaches the consumers through different channels as indicated in Figure 3. Direct actors in dairy value chains include producers (large scale farmers, small-scale peri-urban farmers and urban farmers), collectors (individual collectors, primary cooperatives and

processors), and processors (private large and small-scale processors, and unions), as well as retailers and consumers. Input providers include artificial Insemination services, feed suppliers, veterinary service providers, machine suppliers and packing material suppliers. Service providers include microfinance institutions, commercial banks, insurances, transporters and cold stores. Enabling environment creators include the Ministry of Agriculture, other ministries and bureaus, the Institute of Dairy and Meat, NGOs, research institutes, and professional and business associations. This study focused mainly on what Yilma *et al.* classify as direct actors and input providers and consulted a range of people from the enabling environment. Their value chain diagram suggests that all smallholder dairying is urban or peri-urban, while this study found dairy production in more rural environments, albeit mostly supplying informal markets.

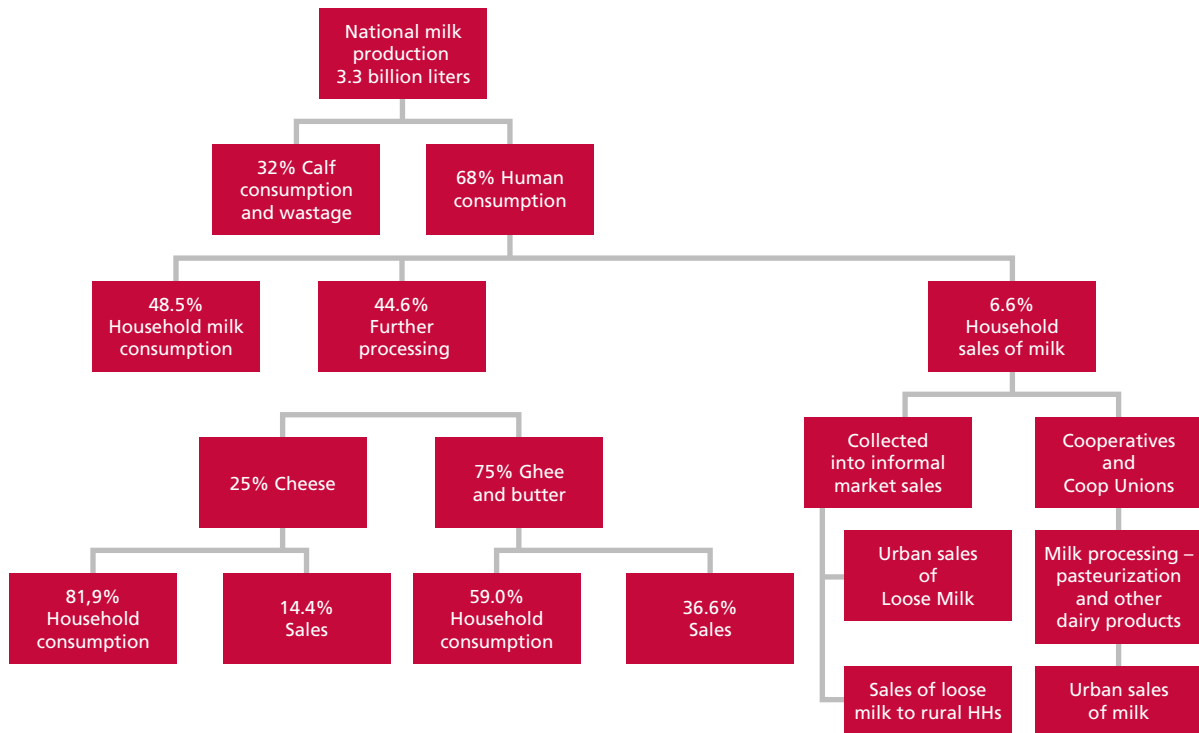
Figure 4 illustrates estimated proportions of milk used for different purposes based on CSA

FIGURE 3
Dairy value chains in Ethiopia: a general picture



Source: UNIDO (2009) in Yilma *et al.* (2011).

FIGURE 4
Allocation of milk produced in Ethiopia



Source: AGP-LMDP, 2013.

data from 2010. However, estimates in different reports vary. The reported proportion of milk sold ranges from seven to 22 percent: seven percent as estimated by Lo'L (2010), Yilma *et al.* (2011) and Beyene (2015); 5.6 percent by AGP-LMDP (2013) (Figure 4); 14.6 percent by the United Nations Industrial Development Organization (UNIDO, 2009) and 22 percent by Staal, Nin Pratt and Jabbar (2008). The proportion of milk consumed by producers as estimated by different reports varies from 34.75 percent to 85 percent: 85 percent by Lo'L (2010), 83 percent by Beyene (2015), 78 percent by Staal, Nin Pratt and Jabbar (2008), 48.5 percent by AGP-LMDP (2013) (Figure 4) and 34.75 percent by UNIDO (2009). The share of milk earmarked for home-based processing is reported at between 8 and 44.6 percent by different authors: 44.6 percent by AGP-LMDP (2013), 10 percent by Beyene (2015) and 8 percent by Lo'L (2010).

Milk and milk products are channelled to consumers through both formal and informal marketing systems. The formal distribution channel can be defined as the flow of milk that falls within the local business regulatory network and is under the regulatory radar. In the formal system, milk is collected at the cooperative or private milk collection

centres and transported to processing plants. Milk quality tests are performed on delivery, thereby assuring the quality of milk. This has encouraged the producers to improve the hygiene conditions, storage and transportation of the milk in order to avoid rejection of the product on delivery to the collection centre.

The informal sector consists in all goods and services that are not part of the formal handling of milk. The main players in the informal sector are the milk collectors and traders who buy directly from farmers and sell directly to an end market such as hotels, milk cafés and milk shops. In the informal channel, milk and milk products may pass from producers to consumers directly or through one or more market agents. Producers sell the surplus milk produced to their neighbours and/or in the local markets, either as liquid milk or in the form of butter and/or home processed products. It is also a common practice for cafés and restaurant owners to keep their own dairy cows, mainly for their own supply. AGP-LMDP reported that many consumers prefer milk from the informal channel because it is full fat, exceeding 3.5 percent butter fat, and there is a trusted relationship between consumers and sellers. The dairy products are sold in bulk without being

packed and branded, often using jerrycans and other simple containers (AGP-LMDP, 2013).

Consistent information is not available on the percentage of milk that enters the formal versus informal distribution channels. For example, according to Tamconsult (2008) and Yilma *et al.* (2011), 95 percent of the marketed milk at the national level is channelled through the informal channel, and 5 percent through formal channels. But, according to Lo'L (2010) and Beyene (2015), 98 percent of milk produced in rural areas passed through informal chains and only 2 percent through formal channels. The amount of milk entering the market through informal channels was 90 percent according to UNIDO (2009). Allowing for variations in figures, the general conclusion is that only a low percentage of marketed milk, 10 percent or less, passes through formal channels. While cities are associated with the development of formal market channels, urban consumers also buy from informal markets. They buy milk for direct consumption mainly from urban and peri-urban dairy farmers. Consumers mainly buy butter from traditional markets (62 percent of total supply). They also buy powdered milk mainly from shops (41 percent of total supply) and supermarkets (56 percent of total supply) of powdered milk. Hotels, restaurants and institutions are important market segments for milk sales. Institutions include schools, training centres, hospitals and military camps, among oth-

ers. They negotiate purchasing agreements with producers on a contract or daily basis. But both milk traders and the processors are supplying this end-use market (AGP-LMDP, 2013).

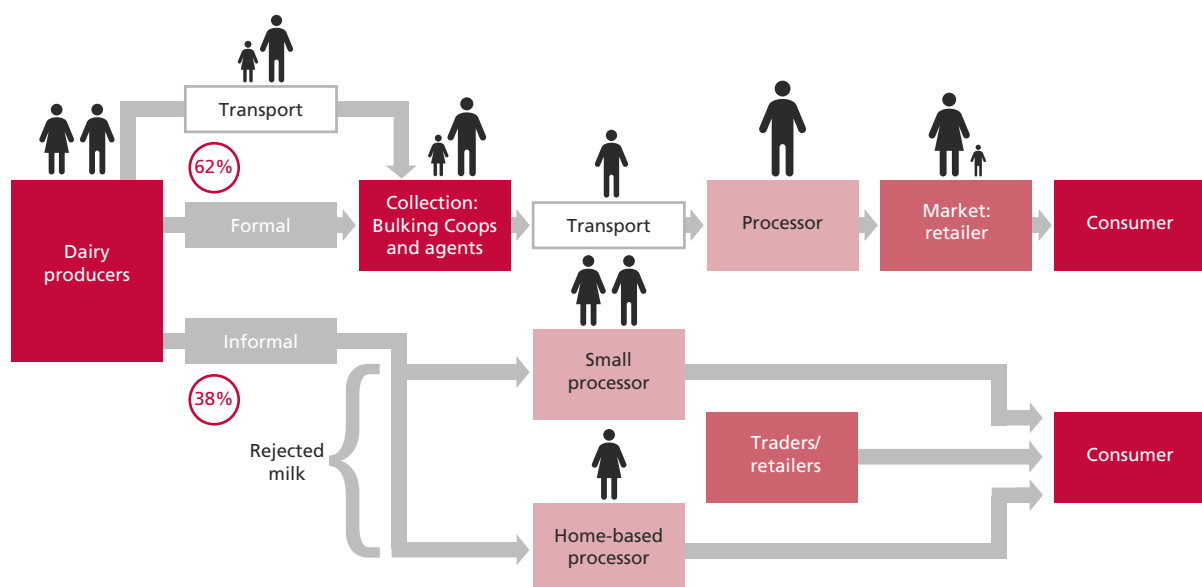
Farmers near urban centres have advantages in having a major market for their milk. Urban consumers buy milk that originates within the urban and peri-urban dairy farmers. About 73 percent of the milk produced in urban areas is supplied to the market, compared with only 4.69 percent for rural areas (AGP-LMDP, 2013).

The formal milk market appears to be expanding during the last decade with the private sector leading the dairy processing industry in Addis Ababa and other major regional towns. However, the share of milk sold in the formal market in Ethiopia (two percent) is much less than that sold in neighbouring countries: 15 percent in Kenya and five percent in Uganda (Yilma *et al.*, 2011).

Value chain structures in the study woredas

All study *woredas* have formal and informal milk marketing channels, as described in the national overview, but provide three very different examples of value chain development. Degem *woreda* has a very high percentage of milk passing through formal channels, while at the other extreme, Arba Minch Zuria has a highly informal milk market with generally low milk sales (Figure 5). In Dejen *woreda* the amount of milk entering the informal channel is not known, but it is expected to be

FIGURE 5
Dairy value chain, Degem *woreda*, Oromia Region



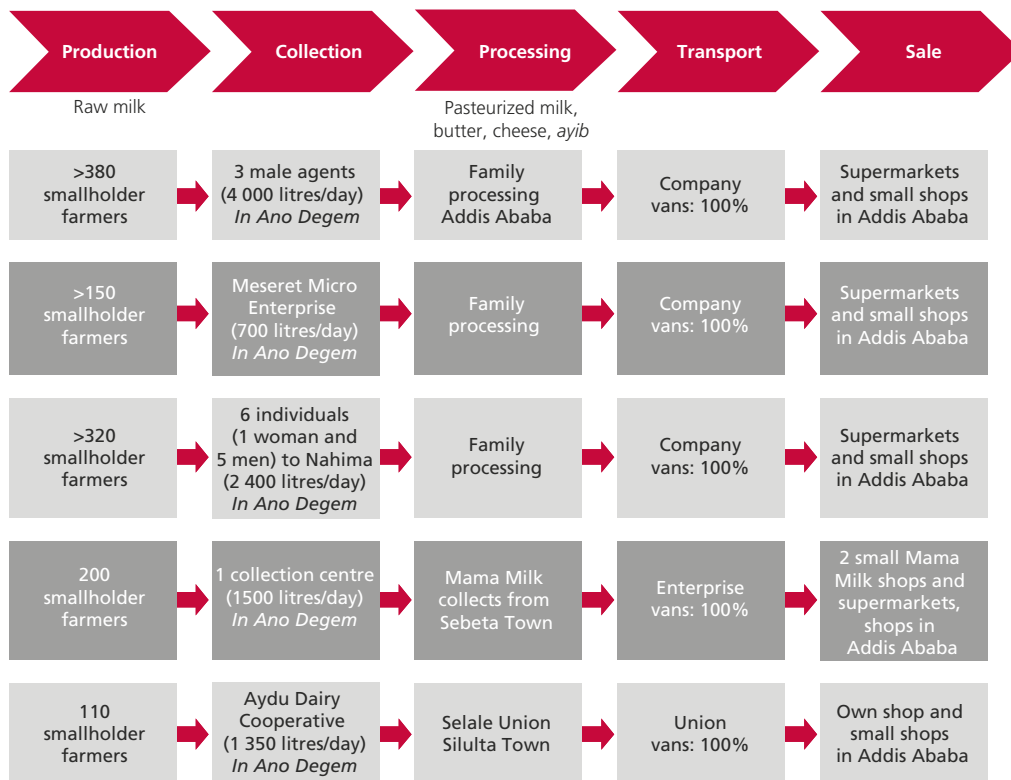
minimal since most consumers, cafes, and hotels in Dejen Town buy fresh milk from a cooperative

The value chain map shown in Figure 6 starts in Degen *woreda*, North Shoa Zone, Oromia Region, and ends at and close to Addis Ababa. As previously mentioned, this *woreda* has a long history of dairying, and many households engaged in dairy as a main income source. The Selale Belt (of which Degen is part) is estimated to cover about 70 percent of Addis Great Milk Shed. While there is no recorded data on milk that enters the formal versus informal distribution channels, qualitative information obtained from FGDs and household and individual key informants suggest that the amount of milk entering the formal chain far exceeds that of informal channels. According to these sources of information, there is minimal milk transaction among neighbours, local cafes or shops as well as informal traders because almost all milk is sold either to processors and their agents, or cooperatives in the Ano Degen study site. Based on this information, it can safely be concluded that most of the milk produced here is entering into the formal chain. According to the information obtained from the *woreda* Livestock

Office, the total amount of milk produced in the *woreda* is estimated at 50 000 to 60 000 litres per day, mostly from small holder dairy farmers and some from a few medium dairy farms. From these, about 50.4 percent (25, 200 litres) per day was supplied to the market in the form of fresh milk. This is much higher than the estimates from the published literature that ranged from 5.6 percent to 22 percent. The proportion of milk allocated for home-based processing to butter and *ayib* (local cheese) was 34.7 percent (17, 360 litres). This is by far higher than 8 percent and 10 percent estimated by Lo'L (2010) and Beyene (2015), respectively, but approximately similar to 44.6 percent reported by AGP-LMDP (2013). The proportion of milk estimated to be consumed as fresh milk by producers was 14.9 percent (7 440 litres), which is far below the approximate average of 73 percent reported by most published literature reviewed in this study.

The share of milk entering the formal market constitutes about 62 percent and the remaining 38 percent is marketed through the informal channel in the form of either liquid fresh milk or processed products, butter and *ayib* in local mar-

FIGURE 6
Ano Degen dairy value chain, Degen *woreda*, Oromia Region



kets. This is much lower than the 90 to 98 percent estimated in other reports.

Comparisons of these results with those from national figures need to be taken cautiously since the *woreda* is not representative of most *woredas* in the country. In the Degem *woreda*, dairy is highly commercialized with a higher percentage of crossbred dairy cows than in most *woredas*, better infrastructure, involvement of several milk processors and traders, and very good access to a central market and processing facilities. These and other factors may have contributed to the high proportion of milk supplied to the market through the formal channel and lower consumption of milk by producers. The lower volume of milk transactions in the informal channel in this dairy value chain may also be due to the fact that most local households, cafés and hotels own dairy cows to produce milk for their own use and to supply their customers. As a result, there is no or minimal milk transaction among neighbours or with local cafes/hotels.

In this dairy value chain, most products channelled through the informal chain are in the form of home processed products, such as butter and cheese, and the proportion of liquid milk passing through this system is small based on the information from the *woreda* Livestock Office.

In Dejen *woreda*, Amhara Region, there is a lower volume of milk produced and supplied to the market than in Degem *woreda*. The amount of milk entering the informal channel in Dejen *woreda* is not known, but it is expected to be minimal since most consumers, cafes and hotels in Dejen Town buy fresh milk from a cooperative. The four primary dairy cooperatives in the *woreda* have a maximum capacity of 1 910 litres of milk per day, compared to more than 15 000 litres that pass through cooperatives in Degem *woreda*.

In Arba Minch Zuria *woreda*, SNNPR dairy production, processing and marketing is informal. For instance, milk from the study site, Shelle Mella *kebele*, is collected by two milk traders and one cooperative. Chamo Hiyque Dairy Production Primary Cooperative is the only one of its type in the *woreda*. It collects milk from members and sells fresh milk to traders, who take the milk to Arba Minch Town and process the unsold milk into butter and buttermilk. In this *kebele*, there are also two milk traders who collect milk from the producers and from the cooperative and supply to small-scale processors, hotels and cafes in Arbminch Town. A total of about 190 litres of milk is supplied to the market from this *kebele*

each day and it is the only *kebele* in the *woreda* that supplies milk to the market. Furthermore, the volume of milk produced and supplied to the market in this *woreda* is very low compared to the other two study *woredas*.

Figure 5 also shows that both men and women are involved in each step of the dairy value chain in Degem *woreda*, but to a different extent in different functions. For instance, the share of women in production is estimated to be higher than men because women play predominant roles at this level. There is a lower share of women than men engaged in bulking/collection, processing and retail functions, activities that are managed through producers organizations where women are involved in to limited degree, are employees of a processing plant, or very few of them are owners and shareholders.

Although the proportion of milk passing through formal and informal channels varies in the three sites, the participation of women and men follows a similar pattern in all three. Across all the study sites, the study result indicated that women were responsible for processing and marketing dairy products in the local markets. Hence, they tend to be more involved in informal chains than men. Furthermore, men have more access than women to formal marketing institutions such as cooperatives. This is consistent with the results reported by other published literatures. Few women run processing businesses and even fewer women provide animal health services (see section 3.2.2).

There is very limited information in the published literature to compare the study findings on men's and women's presence in dairy value chains or market channels. There are claims that women have roles in dairy production, processing and marketing (FAO, 2015), but little has been documented to date about gender roles and relationships in the Ethiopian dairy sub-sector (Tangka *et al.*, 2000, in ILRI, 2015). Staal Nin Pratt and Jabbar (2008) noted that nearly all on-farm processing and sales are conducted by women; as the processing moves off-farm and the scale increases, the share of female labour in processing declines.

Roles of women and men in dairy production

There is an increasing awareness in Ethiopia of the important and traditional role of female in dairy production. Dairy production provides women with a regular daily income, vital to household food security and family wellbeing. In the past, development interventions targeted men, and the

changes introduced frequently resulted in higher labour input by women while women's control over production and output decreased. Gender differences are now more often taken into account at all stages of development planning and management. Previous reports on the gender division of tasks in livestock production and management noted that while roles and responsibilities vary between commodities, locations and the wealth of the household, it is possible to make some broad generalizations.

Women tend to be responsible for activities carried out at or near the home, activities required for the day-to-day care of animals, and storing, processing and adding value to livestock products, while men are more often responsible for activities outside the home. This is evident from observations and analysis in a number of published reports (Aregu *et al.*, 2010; AGP-LMDP, 2013; Benyene, 2015). This corresponds to the findings of this study, where women tended to be predominantly involved in the day-to-day management of dairy cattle as well as home-processing of milk into butter and cheese. Beyene (2015) found that women are predominantly engaged in the production and marketing of milk and milk products. Women in rural areas sell and control income from butter, while women in peri-urban and urban areas sell and control income from milk. This study found that women were predominantly engaged in selling dairy products in informal, local markets and less engaged in formal processing, but could be involved in formal retailing, although not usually as the owner of a retailing business (Figure 5).

However, there are always exceptions to general patterns. For example, in female-headed households, the head of household may have considerable decision-making power and may consult the adult males of the household less than a husband might consult his wife in a male-headed household. Yilma *et al.* (2011) found that 15-30 percent of Ethiopian rural households are headed by women. They tend on average to be poorer than those headed by men and may be less food-secure, but as noted by Aregu *et al.* (2010), the female head of a household may enjoy greater control over resources than married women. However, they may also have less access to information from development initiatives that target men, which results in information 'trickling across' to married women. In female-headed households, the household head tends to have full responsibility for sale of dairy products like milk, and butter and control over the income. This is not only

because most female-headed households are solely managed by the women heads, but also in female-headed households with the presence of a male partner, decisions over major household resources remain under the sole control of the women heads. The male partner in a female-headed household is a passive player, who has usually come into the partnership mainly due to his lack of access to land, financial resources or other assets (ILRI, 2015). In male-headed households, the male head is more involved in selling bigger animals while women are more involved in selling livestock products such as milk, butter and cheese. However, the income from the sales of all sources is jointly controlled by both spouses in most households (ILRI, 2015).

Certain tasks are negotiated and shared between household members, but this may vary according to various factors. For example, Aregu *et al.* (2010) found that decisions about enterprise management and technology adoption are generally taken by men or sometimes negotiated between husbands and wives. The wealth level of the household influences the decision-making pattern – joint decisions are more likely in poor households. Only in female-headed households, women control the decisions; yet these tend to be in consultation with their male relatives. Even when men appear to be in control of decision-making, they usually consult their wives, who have a strong influence on the outcome.

This study found that women on the study sites were predominantly involved in dairy production activities. Both men and women take part in livestock management, but women generally contribute more labour inputs than men and children in areas of feeding, taking care of calves and animals when sick, cleaning of stalls, milking, butter and cheese making, and selling milk and its products. Children are more involved in herding animals and taking milk to collection centres.

The gender division of labour was found to vary between study sites. Women in SNNPR (Arba Minch Zuria *woreda*) are responsible for taking care of animals with the help of children; they gather fodder, look after animals, milking, processing and selling products. Men are responsible for branding of livestock, herding and grazing, selling and purchasing livestock. Gender division of tasks and responsibilities is flexible. Although women take care of animals and men focus more on crops and fruits with better cash income such as banana, cotton and mango, decisions on crop and livestock production overlap and influence each other. According to FGDs

and household informants, when men are absent, women carry out their tasks. Given that men have limited engagement in the dairy sub-sector compared to women, this sub-sector may be an opportunity for women to benefit more and gain a better position within the family.

By contrast, in the other two sites (Oromia/Degem *woreda* and Amhara/Dejen *woreda*) men are more involved in dairy production, particularly in Degem *woreda*. This is mainly because dairy production is able to generate continuous income and profit for a household and production is relatively more commercialized. This has motivated men to become involved in milking, taking milk to collection centres, collecting sales money, fetching water, cleaning stalls, taking care of animals and cutting and carrying forage and grass. There are recent developments in that men are more inclined to recognize women's contributions to dairy production. They now regard activities such as fetching water and cleaning the utensils as work that contributes to the quality of the product. Several couples have started working more together, discussing their plans, and sharing tasks that women used to carry out alone.

In addition to livestock tasks, in all regions, women undertake daily chores with the assistance of girls (with little support from men), such as cooking, washing, cleaning, fetching water, child rearing, agricultural work.

A lesson to be drawn from this study is that while both men and women face several challenges, women more than men specifically face them in the production node. Both men and women have limited access for adequate credit and other inputs to improve their production. Women do not access extension services and technology adaptation training due to restriction in their mobility and other household responsibilities. Women have limited knowledge of branding dairy cow, hygiene and sanitation and quality milk production. They also lack appropriate equipment such as containers for milking, storing and transporting milk to collection points and consequent loss of milk.

The roles of women and men in milk collection and distribution

In informal marketing channels, milk is distributed from producers to consumers (neighbours and/or in local markets) and milk products mainly in local markets. In the formal system, milk is distributed by dairy cooperatives and unions, and the private sector. Milk collected at milk collection centres is supplied directly to consumers in the urban

towns, and the surplus is collected by large dairy enterprises and transported by bulk tankers to the respective processing plants. These dairy enterprises process and pack the fresh milk collected for distribution to consumers in urban areas through agents and retailers. Homogenized, pasteurized and standardized milk (2.7–2.8 percent milk fat) are distributed in half-litre plastic packets (Yilma *et al.*, 2011).

The formal value chain originating in Ano Degem (Degem *woreda*) supplies three big dairy processors (Figure 6), two private dairy processors (Sebeta Agro Industry – Mama Dairy – and MB PLC – Family Milk –) and one cooperative, Union (Selale Dairy Union). Approximately 10 000 litres of milk from smallholders enters the value chain per day. The smallholder dairy farmers deliver both morning and evening milk to the collection points in open fields or sheds every morning. The collection of milk is undertaken by primary cooperatives (PCs), agents of the processing plants and traders from 6:00 a.m. to 10:00 a.m. At the collection points, milk is subjected to a field acidity test for freshness and a lactometer reading for possible adulteration (addition of water) and the removal of cream. The collected milk is transported to processing/chilling centres by cooperative unions, and to processing companies by Isuzu tracks/vans. The Union's vans collect before 6:30 a.m. and private traders and processors collect before 10:00 a.m.

Women, men and children in the study sites all play a role in taking milk to collection points, but when the collection sites are remote, men and boys play the largest role.

In this node, which is essential in linking producers to markets, women face several challenges. Gender-based constraints that hamper equal benefits of women and men include: (i) women's lack of tools or methods to manage quality control; (ii) women's inability to defend themselves when collectors reject their milk, arguing about quality even when the quality is adequate; (iii) distance from households to collection points, inappropriate containers, mobility restrictions for women to reach collection points; (iv) shortage of and/or inappropriate collection points, and absence of shade at collection points combined with delays for several hours in arrival of the collectors, which expose milk to heat and sun, and create a problem for women's daily timetable.

Other constraints that are not based on gender relations are: adulteration by adding water to the milk and subsequent rejection and loss; lack of means to supply and/or cooling facilities

or technologies to preserve night milk, which causes spoilage of morning milk and consequent rejection; and problems faced by collectors due to poor quality supply, inconsistency in milk flow, losses of the product due to inappropriate containers and spoiled milk due to the lack of cooling transportation.

Women's and men's roles in milk processing

The basic patterns of milk value addition such as churning soured milk to make butter and dehydrating butter to make ghee in order to regulate milk fermentation are common practices in Ethiopia. Women play a major role in home-processing of dairy products for sale in informal channels and in a few cases women at the study sites had made a business from processing. However, milk value addition through these methods is often considered inefficient and it is associated with 'losses' of up to 12 percent due to low rates of butter fat recovery (FAO, 2003, cited in Beyene, 2015). This is the reason for which dairy producers prefer to sell fresh milk when there is a market rather than processing at home. For instance, this study found that there is no milk left for home-based processing by Degem *woreda* dairy producers, who have a good connection to markets. However, women may be forced to process rejected milk, which adds to their work load, while the rejected or spoiled milk results in low quality butter and cheese, and is reported to cause health problems by people and even calves when consumed.

Various dairy cooperatives and unions and private dairy enterprises are engaged in the collection, processing and distribution of milk. A study by Land O' Lakes (Lo'L, 2010) found 22 major private dairy enterprises with a processing capacity between 1 500 and 60 000 litres per day (although most were operating below capacity, mainly owing to shortage of milk). The Ada'a Dairy Cooperative, Selale and Asella Dairy Cooperative Unions are some of the institutions that play an important role in connecting milk producers with processors and consumers. There are a few private enterprises involved in the production, processing and distribution of milk and milk products. Sebeta Agro-Industry, Family Milk (supplied by the value chain shown in Figure 6) and Lame Dairy (Shola) are among the largest.

Processors buy fresh milk from commercial dairy farms, cooperatives and smallholder farmers to process into pasteurized milk, cheese, butter and yogurt. Commercial dairy farmers usually sign annual contracts to supply fresh milk on a

daily basis by directly transporting it to the processor's factory or collection centres. As described above, processors establish collection points/centres along major highways around Addis Ababa where they buy fresh milk from smallholder milk producers. Some processors such as Sebeta Agro Industry Plc and Timret Agro Industry Share Company also use their own dairy farms as sources of fresh milk supply. They distribute the processed dairy products to retail shops and supermarkets located in major urban centres. Lo'L (2010) estimated that there were more than 2 500 kiosks, and many milk shops, selling milk and milk products (AGP-LMDP, 2013). However, based on the information obtained from the interview with General Manager of Sebeta Agro-Industry, currently it is not using its dairy farm as a source of fresh milk because the farm converted into a breeding centre. Some processors have also established their own retail outlets at strategic urban centres. Sebeta Agro Industry PLC, for example, has two retail shops in Addis Ababa. Timret Agro Industry Share Company has its own retail outlet. Lame Dairy has several outlets in Addis Ababa (AGP-LMDP, 2013).

Women are not heavily involved in formal dairy cooperatives, as found in all three study sites. Aregu *et al.* (2010) found that women farmers living in male-headed households often feel excluded by the term 'peasant association' and may be excluded because household membership in such associations is usually represented only by the head of a household. Men are expected to participate in meetings and training, and pass on the information and knowledge gained to their wives, but in practice, there is often little 'trickle across'. Women participate directly in women's associations but they tend to be social rather than technical, and provide few opportunities for women to gain skills or knowledge.

The role of large processors was found to vary across the three study sites. Degem *woreda*, with a large proportion of milk passing through formal channels, is highly reliant on formal processing. In Dejen *woreda*, dairy production, processing and marketing are mostly cooperative-based. There are four dairy primary cooperatives in the *woreda* with the capacity of producing, collecting, processing and marketing about 1,910 litres milk per day. The dairy value chain in this *woreda* is simpler and shorter when compared to that of Degem *woreda*. The primary cooperatives collect milk from the members at their collection centres (their premises), partly process into butter, cheese,

and yogurt, and sell some of it as fresh milk to the consumers around and travelling along the main road. In Arba Minch Zuria *woreda*, where the market is mostly informal, processing is also mostly informal.

3.2.2 Profit and value addition

Value addition

The basic patterns of milk value addition such as churning soured milk to make butter, dehydrating butter to make ghee, and removing whey to butter to regulate milk fermentation are common practices in Ethiopia. Milk value addition through these methods is often considered inefficient and is associated with ‘losses’ of up to 12 percent due to low rates of butter fat recovery. Very little information on value addition or profit is provided in published sources. This study provided information on value addition in formal dairy value chains and the profit that can be made by value chain actors (Box 1).

Current *farmgate* prices at the three study sites range from ETB9 to ETB11 per litre on average based on seasonality of milk supply (low price when supply is high during the wet season and vice versa), variability in demand (lower when demand is low, especially during fasting periods), and to some extent, distance from processing and chilling centres (Table 2). The effect of the fasting period on the fresh milk *farmgate* price is most severe in Dejen *woreda* with a 56 percent reduction, followed by Degem (26 percent) and Arba Minch Zuria (22 percent).

The lowest *farmgate* price for fresh milk was observed in Degen *woreda* where it varies from ETB5.5 to ETB10 per litre depending on the season. This is may be due to lower demand for fresh milk and other dairy products associated with the predominance of the Orthodox Religion and related long fasting periods compared to the other two *woredas* and due to limited market outlets to

TABLE 2
Fresh milk price variations during fasting and other seasons

District/ <i>woreda</i>	Fasting period price (ETB per litre)	Normal period price (ETB per litre)
Arba Minch Zuria	8.50-9.00	10.00-11.00
Degem <i>woreda</i>	8.00-9.50	10.00-11.00
Dejen <i>woreda</i>	5.50-6.40	6.60-10.00

Source: Results from this study, 2015.

BOX 1

Value of milk along formal value chains at study sites

<i>Woreda</i> where chain originates	Price at farmgate (ETB/litre)*	Price paid by collector (ETB/litre)	Price paid by processor (ETB)	Price at retail sale (ETB)
Dejen	5.0-11.0			Fresh milk: 9/litre Yogurt: 12/litre Butter: 160/kg Butter: 130-140 /kg during the fasting period Cheese: 6-10/kg during the fasting period Cheese: 20-24/kg during the normal period
Degem	9.0-10.0	10.1-12	Fresh milk: 19.0-20.0/litre	Pasteurized milk: 20-24 /litre Butter: 180-225 /kg at all times of year Ayib: (local cheese) 70/kg, at all times of year
Arba Minch Zuria	10.0	14.0-15.0	Yogurt: 27/litre Buttermilk: 6/litre Butter: 170/kg	Buttermilk: 7/litre Yogurt: 2/litre Butter: 170-300 kg, depending on outlet

Note: Prices apply to the specific value chains studied at each study site.

Source: Results from this study, 2015.

the central market. Degem *woreda* is similar in terms of religion but has better location advantage because it is close to the Addis Ababa market and consequently has several market outlets for fresh milk. The *farmgate* price at Arba Minch Zuria was found to be high and comparable to the prices around Addis Ababa area. This may be explained as the supply of milk is low compared to demand.

There is high value addition at the processing stage; for example, the family processing company in the Degem value chain buys milk at ETB10.5 per litre and sells pasteurized milk at ETB19.5, adding 85 percent to the value of liquid milk. However, there are also high costs associated with pasteurization and packaging. Between the processor and final retail point in Addis Ababa, 5-26 percent of value is added. Between one and

20 percent of value can be added through collection and up to 20 percent between sale by the processor and sale at a retail outlet. Value adding gives an indication of the potential for livelihood generation at different points in the value chain, but it is also important to consider costs and this is done in the next section. Women play an important role in small-scale processing as owners of small businesses and employers. Female employees also play a comparable role to male employees in formal processing firms in some positions, but not those that require physical strength or training in the hard sciences.

Profit

This section discusses the potential profit to be obtained at three points within the dairy value

BOX 2

Estimated gross margin and enterprise profit for four-cow dairy herd, Degem *woreda*

Item	Annual value (ETB)	Comments
COSTS		
Attributable fixed costs		
Depreciation of dairy cow	15 000	Average price of crossbred cow at ETB30 000 and productive age of 8 years
Repair and maintenance	300	
Labour	3 000	
Subtotal	18 300	
Variable costs		
Feed	46 915	ETB32/cow/day
Animal health	1 200	ETB300/cow/year
Water	1 460	ETB1/cow/day
Breeding	20	
Subtotal	49 595	
Total cost	67 895	
INCOME		
Sale of milk	97,200	Price of milk: ETB9/litre. Average production: 9 litres/day, milked for 10 months and all sold as fresh milk
Sales of dung	960	
Total income	98 160	
Enterprise profit	30 265	
Gross profit	48 565	

Note: this budget excludes income from the sale of calves, which is an important source of revenue in some years. A male calf may be sold for a few hundred Ethiopian Birr (EBT), a one-year-old female calf may fetch EBT5 000 and a crossbred heifer, EBT25 000-40 000. Source: Results of this study, 2015.

chain (production, milk trading and small-scale processing) and through the provision of services (feed and animal health).

AGP-LMDP (2013) estimated the gross margin of 14.7 percent return of the total operation cost on its sales for a five-cow dairy farm in East Oromia. In this study, an enterprise budget was constructed for a four-dairy cow farm in Degem *woreda* (Box 2). The analysis shows that feed comprises about 69 percent of the total annual farm cost, followed by a 22 percent depreciation cost of the dairy cow. The cost of feed is approximately similar to the estimation by AGP-LMP (60 percent). The high share of feed in the total cost is also in line with a report on the economics of urban dairy farming, which showed that concentrates had the highest share of the total cost of production (Dayanandan, 2011, cited in Lemma, 2014).

The example in Box 2 shows that a small-scale dairy farm with four crossbred cows can be run with an annual investment cost of ETB68 000 in the reference *woreda* and able to generate ETB30 200 enterprise profit per year (ETB7 550 per cow), justifying the high input of family labour that is required to care for the animals (not included in the cost). According

to focus group participants and household key informants in this study, dairy is very important among agricultural activities because it generates daily, bi-monthly or monthly income for the farmers. For example, a household who owned two to three crossbred dairy cows is able to generate ETB2 000 to ETB3 000 monthly gross margin on a regular basis. However, this depends on a reasonably reliable market for milk. If the average farmgate price of milk was ETB8 (as could be the case in Dejen *woreda*) instead of ETB9 in Degem, the enterprise profit for a cow would be only ETB4 800 a year instead of ETB7 550. Alternatively, if the price of feed rose by 25 percent, the enterprise profit per cow would be ETB4 600 ETB. Furthermore, the dairy profit is negatively affected by spoilage and spillage of milk from production to collection points. This is mainly due to: the use of inappropriate containers for milking, storage and transporting; lack of cooling facilities to preserve night milk; and limited hygiene and sanitation knowledge resulting rejection of milk and consequent loss. The impact of these challenges is higher on women's profit since they lack methods and tools to manage quality control compared to men, and the consequent

BOX 3

Profit made by a small-scale milk trader

A. is a 38-year-old married woman in Shelle Mella kebele, in Arba Minch Zuria *woreda*. She has been engaged in the milk trade since 2012. She collects on average 70 litres of milk per day from her kebele and supplies small-scale milk processors in Abamincnch Town. She employs three milk collectors who collect milk from the villages and pays ETB100 per day for the 'Bajaj' owner who transport milk (15 to 20 km) from the kebele to Arba Minch Town. Currently, she is making a gross margin of ETB7,900 per month from the business and is able to pay just over ETB4 000 per month in lqub. She says that the milk trade is rewarding even beyond her expectations. It not only provides financial gains, but she has also gained social acceptance, trust-worthiness, and reliability in the community, which makes her even happier. She receives and makes payments on a monthly basis. This shows that she has created a good market linkage based on trust with both milk producers and processors.

Annual budget (ETB)		
Attributable fixed costs	Loan repayment	36 000
	Labour	9 600
Variable costs	Milk purchase	255 000
	Small equipment	192
Total cost		300 792
Income	Milk sales	395 250
Gross margin		94 458
Enterprise profit		48 858

BOX 4**Profits from small-scale milk processing**

B. is a 26-year old women who has been engaged in small-scale home-based milk processing since 2013 in Arba Minch Town. She processes milk into yogurt (*ergo*) and butter, buttermilk (*arear*) and cheese (*ayib*) if *ergo* is left from sales. She buys raw milk from traders who collect milk from rural kebeles. She pays them monthly. Currently, she can process and sell 90 litres per day on average. She sells yogurt and bread in a small shop, and employs three other women on a permanent basis. She buys milk from the traders at ETB15 per litre on average and sells yogurt at ETB27 per litre, butter at ETB170 per kg (or ETB300 per kg in retail prices, i.e. if sold in cups). She earns a gross margin of ETB18 000 per month from yogurt sales. Considering that B. also has invested in urban land purchases in Hawasa and around Addis Ababa, and indicated that her *iqub savind* is ETB6 000 per week, the profit from her dairy business might very well be greater than indicated.

Source: Results from this study, 2015.

burden on their work load resulting from processing of rejected milk.

Profits were also calculated for milk traders and small-scale processors. The analysis result shows that these actors are making a profit although it is hard to estimate precisely how much as they tend not to keep records about their stocks, sales and expenses.

Based on the available information from the actors, the milk trader in Arba Minch Zuria *woreda* and the small-scale milk processor in Arba Minch Town are making important margins from these businesses as the case study results show (Boxes 3 and 4).

The same analysis made for a small private animal health clinic (Box 5) and a drug supplier's shop (Box 6) indicated that they benefit from the business since they are self-employed and earn an income that helps sustain their family life. According to the interviewees, they enjoy freedom that self-employment provides and have secured a higher income than Government-employed friends who have similar education backgrounds and experiences. However, there are financial and regulatory challenges to engaging and sustain in such businesses, according to the interviewees; for example, a rural animal health clinic may only

BOX 5**Profits for a female animal health service provider, Dejen *woreda***

C. was an Animal Health Technician (AHT) in the *woreda* Livestock Office two years ago. Currently, she is engaged in animal health service provision by opening her own a small animal health clinic in Dejen *woreda* Yitnora kebele (which is the only private clinic in the *woreda*). She has fresh memories of the challenges she faced in the last two years until she earned the trust of the livestock owners. Currently, she has many clients who consult her regarding livestock diseases. She provides both simple tests and drugs supply services. She uses a microscope for simple tests such as ascaris I and the identification of parasites, etc. She prescribes drugs based on the result of the test and uses her own stock. She is earning a relatively significant income from this business. The enterprise profit she made in the last year was almost ETB15 000. She is earning her livelihood from this business and is optimistic that her business will expand and generate a better income in the future.

Annual budget (ETB)		
Fixed cost	Depreciation	1 500
	Labour	2 700
	Rent and utilities	4 800
Variable costs	Stock purchase	30 000
	Consumables	744
Total cost		39 744
Income	Sales	54 740
Gross margin		23 996
Enterprise profit		14 996

Source: Results from this study, 2015.

BOX 6

Profit for a male veterinary drug shop owner

D. is a veterinary drug supplier in Arba Minch Town. He supplies the main veterinary drugs for major diseases in the area. He has hired one drug expert to work under him. The transactions of the drug shop amount to nearly ETB400 000 per year and he made ETB75 000 business profit last year. He explained that the income from the shop is the source of his family's livelihood.

Annual budget (ETB)		
Attributable fixed costs	Transport	18 000
	Labour	28 800
	Rent and utilities	9 600
Variable costs	Stock purchase	240 000
	Consumables	24 000
Income	Sales	395 400
Gross margin		131 400
Total cost		320 400
Gross profit		75 000

Source: Results from this study, 2015.

be profitable if combined with drug sales, but this may not be permitted. Boxes 5 and 6 provide information on the benefits and gross margins realized by a small sample private animal health clinic and a drug supplier shop in Dejen and Arba Minch Zuria Towns, respectively.

The five examples presented here demonstrate that it is possible to earn a livelihood in many parts of the dairy value chain and in locations where dairying is not highly commercialized as well as areas where value chains are more developed. Three of the enterprises are owned by women, which suggests that while women are not strongly engaged in operations other than milk production (as discussed in section 3.2.1), they are capable of making a profit from a range of dairy-related activities.

These findings lend weight to the reports by the FGD participants that dairying has served a source of livelihood and means of self-employment for more than 85 percent of the households in Ano Degem, and also supports a number of households in the other two study *woredas*. They also lend credence to the Livestock Sector Analysis (LSA) results that cattle is the dominant species in 70 to 90 percent of livestock producing households, depending on production zone and dominates smallholder income generation in lowland and highland production zones (DLMP, 2015–2020).

Use and control of dairy profits by women and men

The published literature shows that control over the benefits of agricultural production varies between

women and men in different countries including Ethiopia, partly reflecting their labour input, but also the use of produce in the home or for sale, cultural norms regarding 'women's' and 'men's' enterprises, and the dominance of men as the household head. Generally, men have the greatest control over the income generated through the sale of produce (Aregu *et al.*, 2010). There are very few enterprises in which women dominate both the workload and the control of the benefits, although it is almost impossible to draw general conclusions about the division of labour and the share of the benefits due to differences between locations and with household wealth (Aregu *et al.*, 2010).

Some reports show that women in rural areas sell and control income from butter, while women in peri-urban and urban areas sell and control income from milk. The income from milk and butter sales is controlled by women (Alemayehu *et al.*, 2012; Yilma *et al.*, 2011). However, a study in Kenya, Rwanda and Uganda (TechnoServe, 2008) found that control of milk income was also influenced by the timing and location of sales. For example, women generally had greater control over the evening milk than the morning milk, and greater control over income from milk sold at local markets and to neighbours. The same study found that women received dairy income in 35 percent of the households that sold milk to individual traders but in only 16 percent of households that sold milk to collection centres (*ibid.*). Increasing demand for dairy products creates good opportunities to increase women's role in dairy value chain

development and hence to raise their income (Beyene, 2015), but formalizing milk markets through member-based collection centres and cooperatives can in some instances lead to a loss of women's income from milk (Aregu *et al.*, 2010).

A household survey conducted by the International Livestock Research Institute (ILRI) – Livestock and Irrigation value chains for Ethiopian Smallholders (LIVES) project indicated a different trend in the control of the benefits obtained from dairy production in male and female-headed households. The survey found that women in male-headed household led in selling milk and butter while men had a greater involvement in selling large animals. However, husband and wife negotiate over the use of income from both sources (ILRI, 2015). In female-headed households, the head is solely responsible for selling all animal products, and the spouse has no role. Similarly, in most female-headed households, the female head has main control over the income from the sale of the livestock products while the spouse has limited control (ILRI, 2015).

In this study, FGD participants in Degem *woreda* and Arba Minch Zurhyia *woreda* reported the existence of joint ownership, consultative control over and benefit from the dairy resources, and income in most households despite men's entitlement to the resources. However, further triangulation of this analysis using information obtained from the household or individual interviews with men and women revealed a difference from what was stated in FGDs in that there are limitations in the level of women's involvement in making informed decisions in all issues concerning them, although there are experiences of consultation between men and women. FGD participants in Dejen *woreda* held different opinions; in their view, in most households (they estimated 70 percent), men dominated the decisions and control over the income and benefits from the dairy products. Men might consult with women, but will take final decisions themselves on the control over and use of the dairy income. It is men who are informed about the household's income and expenses, while women may only have general information given by men about sales and expenses. This may be due to women's focus on their day-to-day responsibilities, their trust in men to manage finances and their lack of education to keep records on expenditures and income. However, there are some cases in which the household's dairy income is controlled and managed by women.

As previously discussed, the study revealed that household income from the sales of dairy products is commonly used on the basis on consultation between men and women and at times boys and girls. However, there are differences in the level of consultation, management, control over and benefit from the income from household to household and in different locations. For example, in lowland *kebeles* in Arba Minch Zuria *woreda*, where there are cash crops such as banana and cotton that generate a great deal of money for a household which is controlled by men, income from dairy products is left for women to control. This is not the case in highland *kebeles*, where there are limited sources of alternative cash income for men, who tend to have more control over the dairy sales income.

Major areas of expenses, based on the information from mixed group FGDs, include, as a priority:

- *iqub* (traditional group) saving;
- animal feeds and drug expenses;
- education of children;
- other social uses such as *edir* (traditional social insurance);
- investment in improving the house, expanding the dairy farm, etc.

According to women FGDs participants, before the current regime, women had no voice with respect to joint property. But since the first half of the 1990s, there have been clear positive changes in their roles, responsibilities and participation in decision-making and control over resources.

Equal participation and sharing of responsibility between men and women in dairy production and control over and use of dairy income and other resources is a recent development since the change in the current government policies after 1991. According to FGD women participants, it is a result of:

- government focus on gender equality and policy support, such as the constitution and land ownership policy;
- legal protection of equal rights of men and women on the joint properties;
- awareness creation, education and training provided for both men and women by government organizations and NGOs, which has positive impact on the changing attitudes of men and women on gender equality.

3.2.3 Other benefits

Nutrition

Most of the dairy households in Ethiopia are reported to directly consume their animals' milk production (85 percent) (CSA, 2010-11). An increase in household income through the adoption of improved dairy technology leads to improving the household's nutrient intake, which contributes to better health and nutrition; this may result from consumption of milk or the sale of milk to buy other foods. However, the issue of technology did not emerge in the interviews for this study. Smallholder producers will trade milk for in-kind payment for casual on-farm labour or for barter with shops, although this is more common in the highlands.

The nutritional value of dairy products is known among the communities consulted in this study. Those interviewed noted that milk is essential food for human health, body growth and strength. They emphasized that milk was particularly important for children and patients, because it is medically ordered as a main food for TB patients. According to the interviewees, people, particularly children, who feed on milk become strong and healthy. Despite such community awareness on the nutritional value of milk, household consumption remains minimal. Milk is occasionally used for own consumption based on demand, but not as a regular meal. This is especially common in the households of Degem and Dejen *woredas* where most or all dairy cows are crossbred. When they do consume milk, they consume 0.5 to 1 litres of milk based on the size of the family and the volume of milk produced. In such cases, much of their focus is on sale of fresh milk rather than consumption or processing into butter and local cheese. Furthermore, commercialization of milk in Degem *woreda* may have encouraged producers to supply more milk rather than consume at home unlike most other *woredas* in the country. Home-based processing is not feasible and not commonly practised due to low fat content of crossbred cow milk. Most households interviewed in Arbmich Zuria *woreda* set aside evening milk for consumption and home-based processing. Households in the other two *woredas* that own both cross- and local breeds tend to set aside milk from local breeds for household consumption. In the study sites and in most parts of the country, milk is earmarked for sales, consumption or other uses by women, and most milk set aside for the household use is consumed by children, men and patients.

Women usually tend to consume processed by-products such as butter-milk and whey rather than fresh milk.

Employment generation

Livestock value chains represent a large and growing employment sector. Various reports provide estimates of employment generation in the dairy sub-sector. They all concur that there are considerable possibilities for generating employment in dairy value chains. Employment varies between and within production systems. Staal, Nin Pratt and Jabbar (2008) estimated that dairying from small-scale mixed farming systems, which produce 900 million litres of milk annually, can create 166 million person-days of work, which is equivalent to 553 500 full-time jobs at 300 days per year, or 615 000 jobs at 270 days per year, while the urban/peri-urban dairy system creates annually 4.4 million person-days of work or 16 400 full-time jobs. UNIDO (2009) estimated that labour use in various dairy processing and marketing activities in different production systems and scales of operation in Ethiopia totalled an equivalent of 174 000 full-time jobs in 2004. According to the same author, on-farm processing and marketing generate 94 percent of the daily employment as commercial processing is still at the rudimentary stage in Ethiopia. Yilma *et al.* (2011) estimated that in 2010, dairying created an estimated 588 000 full-time, on-farm jobs in the country.

The projection of human population in Ethiopia shows an increasing trend, which in turn increases the demand for food especially of animal origin. A study by Lo'L (2010) finds that the growth in the dairy sub-sector to meet new demand could create up to 73 000 new dairy related jobs by 2020.

However, occupational distribution data disaggregated by sex indicate that there are still significant gender disparities and gender-biased labour market segregation. Wage data also show that, for the same occupation within or outside the agricultural sector, women in Ethiopia continue to earn on average 40 percent less than men in paid employment. In rural areas, the wage gap between men and women grew from 43.0 percent in 2009 to 44.7 percent in 2010 (ILO, 2013).

Based on CSA data, more than half of women (56 percent) engaged in agricultural work are unpaid workers, most likely employed by family members at the peak of the agricultural season. Women are more likely to be paid in cash if they are employed in the non-agricultural sector, and they are also more likely to work for someone

outside the family. Around 44 percent of women are self-employed (CSA, 2010-2011).

At the study sites, dairy processing enterprises from home-based, small-scale to big factories have created employment and self-employment opportunities for several professionals and non-professionals. For example, Omelisan is a very small enterprise in Arba Minch Town engaged in home-based processing of milk mainly to yogurt. It has the processing capacity of 80 to 100 litres per day. It has created employment opportunities for four women including the owner. Gion and Yitnora are two dairy primary cooperatives in Dejen *woreda*, engaged in small-scale milk collection and processing, which created employment opportunities for seven people (five women and two men) and six people (four women and two men) in the area, respectively.

Furthermore, two large dairy processing enterprises in the country, which were visited and interviewed in this study, Sebeta Agro Industry (Mama) and Lame Dairy (Sholla), created employment opportunities for 339 people (67 women), including casual labourers, and 245 people (72 women), respectively. In the former, there is a strong participation of women in the ownership of the enterprise; two of the three shareholders and members of the Board of Directors are women. This processor is the largest and leading enterprise in the dairy industry in terms of the capacity and diversity of the dairy products it processes. In both enterprises, women are actively engaged in all positions from professionals to non-professional positions. Mostly they are actively involved in the areas such as quality control, accounting and sales. They have limited involvement in areas that require physical strength such as machine operation and maintenance. Their participation is limited in the positions that require veterinary and animal sciences skills and knowledge, which may be a reflection of the bigger picture in the country given that they have limited participation in the higher education system.

Dairying creates job opportunities for the landless in the study communities because they can engage in production on a very small plot of land, as well as trading and small-scale processing. For instance, from one of the FGDs, nine out of 20 participants owned dairy cows but no land (45 percent) in the Ano Degem *kebele*.

Social status

Interviewees in this study indicated that dairy cow ownership has social implications for the owners.

Households that own a dairy cow are considered rich in all consulted communities and enjoy greater reliability for paying credits by the traditional money lenders. Owning livestock/dairy cows is relatively easier for women than owning any other assets as indicated in several published reports. This indicates that supporting women to own this asset enhances their social status in the study communities.

Ability to save

In highland areas, income earned from daily milk production is used to purchase agriculture inputs or hire labour and land, effectively increasing a household's food production potential and resilience. Although the daily income earned is marginal, especially from the low milk producing local breed animals, milk sales and livestock ownership contribute to food security. The monthly cash/barter transaction enables farmers to save small amounts of daily income for re-investment into household livelihoods or the purchase of other livestock (AGP-LMDP, 2013).

According to FGDs participants, the regular income generated from the dairy products as producers, traders and small-scale processors is essential for improvement of their lives, saving, and investment. For example, dairy producers in Ano Degem *kebele* participating in the FGDs said that households who owned from two to three crossbreeds are able to earn a 2 000 to 3 000 monthly income and save (pay 'Iquib') from ETB1 000 to ETB2 000 per two weeks. Moreover, they are able to engage in the construction of better houses in the urban and rural areas for rents as well as for residence and dairy expansion and other investments. The two women previously described in case studies of milk trading and small-scale home-based processing also used their profits for iquib saving.

3.2.4 Inputs and services

Women and poor households in dairy value chains must access agricultural inputs mainly through the formal, government sources, which are restricted, while they obtain knowledge mostly from informal sources. There is limited private sector involvement in input supply and service provision, which mainly caters to the needs of the rich and middle-class households, and can be inaccessible to women and poor men for logistical reasons, or can be too expensive for them to access. Most men have access to extension and training from a variety of sources, whereas women and men

from poor households are marginalized in this respect. Rich and middle-class households access credit from credit and savings associations, while the poor access credit through limited government sources.

Information, knowledge and extension

The Government of Ethiopia is responsible for transferring technical information on commercialization of dairy smallholders, as well as enhancing growth in the rural areas (Lo’L, 2010; AGP-LMDP, 2013). However, CSA (2010–2011) data revealed that although producers and cooperatives describe many extension and training events, only 24.6 percent of dairy farmers who own a cow have been engaged in the development of dairy extension packages.

The sources of agricultural and non-agricultural information accessed by individuals are related to household wealth and gender. Men have access to both formal and informal information sources, while women mostly access informal sources. Men from rich and middle-class households obtain information from the radio, development agents and extension workers, NGOs, and farmers’ conferences at the *kebele* and *woreda* levels. In addition, they also have more possibilities to access information through informal sources while they socialize with friends, from indigenous support and social networks like *iqub*, *idir*, *debo*, and from market places. Women obtain information from neighbours while participating in indigenous self-help and social network associations, as well as through their husbands, children and friends. The sources are mostly informal, indirect and sometimes provide incomplete information (Aregu *et al.*, 2010; Yilma *et al.*, 2011; AGP-LMDP, 2013).

Wealth status and gender differences also influence the kind of knowledge accessed by men and women farmers. Men farmers access formal sources to improve their skills and knowledge, even in areas where women do most of the activities, although the degree and access differs between rich, middle-class and poor farmers. Men also exploit indigenous sources to advance their knowledge, such as elders’ meetings and councils, visits to distant localities, and socializing with colleagues and relatives. Men farmers from rich and middle-class households are the main participants at training courses and experience-sharing visits organized by Regional Agricultural Officers (RAOs) and NGOs. Poor men and women from all wealth groups have little opportunity to access training organized by RAOs. As a consequence,

women mainly depend on indigenous knowledge and skills passed on to them from their parents, while many men can benefit both from the skills training and indigenous knowledge they acquire. This places men in a better position to take informed decisions and control domestic as well as the public spheres (Yilma *et al.*, 2011). Women are excluded from capacity-building interventions due to cultural norms, traditional roles of men and women, and mobility restrictions. According to FGDs and key and informant participants, women in male-headed households are mainly not engaged in such capacity-building interventions. Some international donors, NGOs and community-based organizations support or implement development programmes that include extension activities. Neither processors nor input supply companies provide technical education services in dairy production (Lo’L, 2010; AGP-LMDP, 2013).

Breeds

Cattle in Ethiopia are kept for multiple purposes, most of which are local breeds adapted to multi-purpose use. Very few large-scale dairy farms that are located around Addis Ababa and other regional major cities and a few urban and per-urban dairy farms are specialized in milk production and keep crossbreeds and pure exotic breeds, especially Holstein-Friesian (Yilma *et al.*, 2011).

Access to good crossbred dairy animals has been facilitated through bull service, initially organized by the MoARD through the Extension and Project Implementation Department (EPID) and later by the Animal and Fisheries Resource Department. During the bull service period, 75 percent of the crossbred bulls were distributed together with crossbred heifers. SDDP was also engaged in bull service through the distribution of breeding bulls to individual farmers and the establishment of breeding bull stations (Yilma *et al.*, 2011).

Breeding of crossbred cattle in government breeding stations started in the late 1960s. The production of deep-frozen semen started at Chilalo Agricultural Development Unit (CADU) in 1973. During the 1970s, the Government established crossbreed heifer multiplication ranches. In 1966, research centres such as Holeta started experiments on the interaction of genetics and the environment through breeding programmes of sire breeds of exotic origin with dams of indigenous origin at different ecological zones (Yilma *et al.*, 2011).

Artificial insemination service provision has long been considered a government duty. How-

ever, very recently, the Addis Livestock Production and Productivity Improvement Service (ALPPIS), established in April 2009 by a group of professionals in various disciplines of livestock development, has emerged as a private initiative. It provides superior genetic materials from reputed sources abroad to commercial and smallholder farmers, as well as up-to-date information on the proper management of dairy farms. ALPPIS also trains and sensitizes artificial insemination technicians and farmers on various aspects of dairy management and artificial insemination services, and provides advisory and consultancy services to dairy customers that use ALPPIS services (Yilma *et al.*, 2011).

Despite over four decades of breed improvement efforts by government and development agencies, slightly over 99 percent of cattle in the country are local breeds (CSA, 2010-2011; Lo'L, 2010). Furthermore, the breed improvement services are not accessible by smallholder farmers, particularly by women since they are provided from or at *woreda* centres. Accessing these services requires a means of communication such as a mobile phone, which is not accessible or applicable for most rural women, and cattle must be taken to *woreda* centres. Partly due to this and other related constraints, the dairy farming systems in the study *woredas* are heavily dependent on low productive local breeds. The situation is better in Degem *woreda* where crossbred dairy cows constitute more than 30 percent (7.4 percent at the zone level). However, the percentage of crossbred dairy cows in the other two *woredas* is less than 1 percent.

Feed

Feed is the key input for animal productivity and its cost represents more than 60 percent of operating costs in a commercial dairy business. Feed is obtained from on-farm feed supply, communal grazing, purchased feed/forage, and manufactured commercial feed. Home-produced hay production is rare in rural areas. Stall feeding is the norm in intensive dairy production, using herbage from hay or crop residues. Pasture-based dairy is rarely practiced in urban or peri-urban areas due to land limitations. Home-produced hay production is rare in rural areas (AGP-LMDP, 2013).

According to CSA data (2010-2011), green fodder (grazing) is the major type of feed (about 59 percent) followed by crop residues (29 percent).

Although grazing is the most important source of feed, crop residues may be the only source of

feed for dairy cows over a period of one to two months at the end of the long rains after harvest, when the natural pasture is drastically reduced.

An adequate supply of water in both quantity and quality is required for dairy cattle to maximize feed intake and production. The main sources of drinking water for livestock are rivers and streams. A substantial number of producers also use water tanks to collect and conserve rainwater from iron roofed houses.

FGDs participants and key informants interviewed in this analysis emphasized that feed should be accessible in terms of quality and quantity for maintenance and expansion of their dairy farms. The main feed sources in the visited sites included cut and carry grasses, crop residues, grazing, hay, local brewery residues, and some supplementary factory by-products. Dairy cow owners access these feeds from own farm fields and communal grazing lands, purchasing from growers, processors and traders. However, there was no trader engaged in the feed supply in the study *woredas* at the time of the field visit. Factory by-products were supplied either by cooperatives, particularly in Dejen *woreda* or bought by dairy owners from distant towns outside the *woredas*. There are also government organizations, NGOs, development agencies and research institutions supporting the supply of feed seeds and seedlings, provision of training on feeds production, preparation, feeding and feed managements, for example, ACDI/VOCA (FEED II), Netherlands Development Organization (SNV) (EDGET) and ILRI (LIVES) projects.

In Degem and Dejen *woredas*, zero-grazing is mostly practised for crossbreeds and semi-zero grazing for local breeds. In Degem *woreda*, a prominent *Sinar* oat (locally known as *shallo*) is predominantly used as a source of cut and carries animal feed. According to interviewed sources, the *shallo* was introduced to the area in the 1960s when the first private dairy farm was established. Referring to a draft study report, the North Shoa Zone Livestock Office indicated that there are 2 400 ha of land owned by 2 000 farmers, which has potential for *shallo* and other forage production but not for crops. Currently, it is produced as a main source of animal feed and source of income in 11 *woredas* (84.6 percent) in the zone. Currently, *shallo* forage is an essential feed for dairy cows and for fattening farms in the area and is grown by most farmers, both those who have dairy cows and those who do not. Usually, men cut *shallo*, and women carry and feed dairy

cows. According to the Zone Livestock Office, *shallo* is an important cash product for non-dairy cow owners.

Regarding the gender division of labour in feeding, men are mainly responsible for cutting crop residues and other grasses, and supplying purchased concentrate feeds. Grazing is mainly responsibility of boys and in some cases, girls and men participate. Women usually play a major role in carrying crop residue and cut grass, and feeding animals in the homestead. Further, both men and women have similar concern for feed and this can be seen from the resource they allocated (their dairy income, labour and time). This is more evident in two study *woredas* (Degem and Dejen) where zero grazing is practised, but in Arba Minch Zuria *woreda*, grazing is main source of feed.

Animal health

The animal health services delivery system is considered inadequate and is widely criticized by livestock owners, especially dairy producers (AGP-LMDP, 2013). In response to an identified animal health service delivery gap, government organizations, NGOs and development organizations have introduced different models of a community-based animal health service delivery system (Lemma, 2014). Although some veterinary services are provided by government extension, most farms in urban and peri-urban areas obtain the service privately on a regular basis or over the phone on an as-needed basis. However, regular vaccination is mostly obtained from government extension. In some areas, community animal health workers support the veterinary service (AGP-LMDP, 2013).

In the study sites, provision of animal health services is mainly a government duty. The Government provides vaccination, laboratory testing and drugs services at the *woreda* and *kebele* levels, as well as infrastructure and facilities. Most health services at the *kebele* level are not functional. Private animal health clinics and drug shops provide supplementary services. Men are more likely than women to work as government veterinarians and run private clinics and veterinary drug shops, because women generally lack the technical qualifications and access to capital; however, there is one example of a veterinary clinic run by a woman, as shown in section 3.2.2. The government services are provided at low prices or free of charge. However, the dairy cow owners surveyed stated that the animal health services are inadequate. The constraint posed by limited

animal health services, and the particular problems for women, are discussed in section 3.2.5.

Credit

Ethiopian livestock owners have access to credit from government-owned banks, private banks, micro-finance organizations (Dedebit in Tigray; ACSI in Amhara; OCSI in Oromia; Omo Micro-finance and Sidama Microfinance in the SNNPR) and NGOs (Lemma, 2014). However, their interest rates can be high and they lend only limited sums. Government banks have the lowest rate of interest but can generally only be accessed by smallholders within organized groups or cooperatives (Lemma, 2014). Based on the study results of Lo'L and LMD projects, a persistent concern of actors in the dairy value chains is the difficulty in accessing credit for investment and working capital. Smallholders and cooperatives in particular have difficulty in obtaining credit (Lo'L, 2010; AGP-LMDP, 2013). Furthermore, according to Aregu *et al.* (2010), men have access to all services such as credit, whereas women and men from poor households are marginalized in this respect.

FGD participants and households/individuals interviewed complained that the amount of credit they can access is not adequate to start or expand a dairy business due to the ETB7 000 ceiling for a single loan. This amount is insignificant when compared to the annual cost required to establish and run a small dairy business, as indicated in the case study presented in Box 2.

3.2.5 Constraints

It was previously identified that demand for dairy products has not yet been met by domestic supply, and that Ethiopian dairy cattle generally have low productivity. This section reviews constraints that may prevent the expansion of milk supply through increased productivity or increased herd sizes, and discusses potential gender impacts if these constraints would be removed. Workload is considered first because it is often cited as a barrier to increasing smallholder herd sizes or a potential problem for women if herd size expands. Feed has been identified as a major input and potential major limiting factor to production and this is discussed next. Finally, other factors are considered that may be a disincentive to investment in dairy value chains.

Impacts on workload

Published literature emphasizes the long work day of women in most rural communities in Ethiopia. According to Aregu *et al.* (2010), women work

from dawn to dusk, and in contrast with men, have little time for leisure or socializing. Women are not only the major source of labour in the agricultural sector, but they are also responsible for the vital tasks of caring for children, the sick and the elderly as part of their household responsibilities. They work between 10–12 hours per day throughout the year. In rainfed farming systems, men's workload is lightest during the dry season because they participate to a limited extent in household tasks (Aregu *et al.*, 2010). Given the predominant participation of women in the care of cattle (described in 3.2.1), they have little time in the day to take on the responsibility of larger herds.

The results of this study broadly agree with the Aregu *et al.* report (*ibid.*) in terms of the length of a woman's work day. For example, men's and women's clocks drawn by the participants of FGDs and households' interviews indicated that women in Degem *woreda* rarely have leisure time, whereas men have ample time during the dry season and some men, even in the

wet season before breakfast and after 6:00 PM when women are engaged in preparing dinner, feeding the family, milking and other household duties (Table 3). The same exercises showed that in the dry season, there is no significant difference in women's work load, but the situation is different for men. There are cases where men share some of the women workloads by participating in the milking, collecting dung to one side using fork, feeding, watering and arranging cattle in their stall. During the wet season in Degem *woreda*, the average daily time women spend on livestock-related activities are: 4 hours per day on milking and storing milk; 5 hours, feeding, preparing forage and watering; 1 hour, cleaning the stall (a total of 8 to 9 hours, dairy-related productive activities); 4-5 hours, rest/sleep; 6 hours, domestic activities; and 2-3 hours, community activities and others.

However, this study found two distinctive views regarding impacts on the workload of men and women as a result of engagement and/or

TABLE 3
Men's and women's activity clocks in Degem *woreda* in the wet season

Women	Time	Men
Preparing and milking	5..6	Taking milk to collecting point
Feeding or collecting milk, preparing breakfast	7	Milk selling
	8	Returning home
Feeding children, cleaning stall, eating breakfast	9	Breakfast
	10	
Preparing lunch for herders and farmers	11	Farming
Preparing feed and and forage, watering for dairy cow	12	
	13	Lunch on field
Helping men on the farm by sowing and weeding, fetching water, cleaning the house	14	
	15	Farming
	16	
	17	
	18	Returning home
Feeding forage	19	Supper or coffee beak
Milking and storing milk, preparing dinner, feeding the family	20	Feeding and watching over
	21	Playing with children and eating dinner
Other house-hold duties	22	
Eating dinner	23	Sleep and rest
Sleep and rest	24	

Source: Results from this study, 2015.

expansion of dairy business, according to FGD participants (in particular, women-only FGDs). In the Dejen and Arba Minch Zuria *woredas*, it was argued that expansion in the dairy farms had negative implications on the already heavy roles and responsibilities of women. The basis of their argument is that most of the dairy activities are carried out by women, and men only have limited roles when they are around the homestead. In both *woredas*, men mainly focus on field work, in crop production in Dejen *woreda*, and in banana and cotton farms in Arba Minch Zuria *woreda*. Men in the latter *woreda* have limited attention for dairy cattle since they obtain much more of their income from the banana and cotton farms. Women's role in dairy production is critical, which puts them under pressure to manage the activities besides their home chores. When the number of dairy cows increases or the dairy business expands, a woman's workload is under great pressure because they perform almost all dairy-related activities.

By contrast, FGDs participants in the Degem *woreda* expressed a different viewpoint. They stated that the expansion of the dairy herd may not have negative implications on the women's work load in the area. As a dairy farm expands and become more commercialized, the workload on women is reduced because:

- there is no or limited home-based traditional processing as all the milk produced is sold fresh;
- men have started to take on more responsibility than before as the income from the dairy becomes attractive;
- additional income generated as a result of expansion and commercialization enables the use of hired labour.

Both arguments seem valid based on the existing socio-economic and cultural situations in the respective study *woredas*. It is expected to see such context-based variations in views and practices reflecting social, economic and cultural differences among the study communities.

Hence, interventions on capacity-building training and exposure visits, awareness creation and technology adaptation should:

- take time allocation patterns into account and plan accordingly. The convenient time for men and women to participate in such programmes seems to be in the dry season before the start of field preparation for crop production and immediately after harvest. However, considering that this time may not

be enough to encourage women to participate, additional inputs on time- and energy-saving technologies and services are required both in the dry and wet seasons.

- be aware of the impact on workload of expanding a dairy herd may be location-specific.

Feed constraints

Feed is one of the most critical inputs in dairy production and its supply is highly constrained because of: limited land availability; increasing prices of concentrate feeds partly as a result of high taxation on them; the lack of regulation on feed quality; and water shortage during the dry season. FAO (2011) notes that the introduction, promotion and expansion of improved forage production on the dairy farms have been inadequate and slow.

As mentioned, the cost of feed is a large proportion of the cost of market-oriented dairying, especially for farms that maintain crossbred and grade dairy cattle.

The ever-increasing price of concentrate feed presents a challenge for farmers (EAFIA, 2015). According to this study, the increase in the feeds prices is mainly induced by high taxes. The government levies approximately 68 percent of different types of taxes including VAT on inputs and processed feeds while exempting other agricultural inputs such as fertilizer, chemicals and seeds from customs and local duties and taxes. The price of factory by-product feeds increased from 2005 to 2014 on average by 293 percent, of which the VAT contribution was about 44 percent on average.

The negative impact of government tax on processed animals' feeds is even more severe due to the double taxation effects on imported feed inputs and final feed products.

Based on the same source of data, the prices of balanced feed of dairy cow increased by 194 percent on average from 2012 to 2014 compared to 2005 prices and contributed to the increase in the cost of producing one litre of milk from ETB2.13 in 2005 to ETB6.70 (314 percent). Milk prices increased from ETB2.17 per litre in 2005 to ETB15 (591 percent) per litre in 2014 (EAFIA, 2015), of which the contribution of government tax is about 88.65 percent. According to the FGD participants, the effect of high feed prices on the dairy production is greater on female-headed households than male-headed households since they have limited financial capacities and limited mobility to look for and find alternative feed sources. Further, this has a negative impact

on households who own crossbreds households because grazing is not a feasible alternative for them due to their tendency to be infected by various diseases compared to the local bred.

Lack of access to land to keep additional animals and to grow forage and feed, as characterized by Tamconsult (2008) is “perhaps the greatest institutional and socio-economic constraint that the dairy industry faces today”.

Animal health constraints

Livestock diseases and parasites are widespread throughout Ethiopia. They cause direct economic losses through mortality and morbidity, and through diminished reproductive performance (AGP-LMDP, 2013). In addition, consumption of animal-source food is notably linked to the presence of a number of human diseases of animal origin and are a consequence of the consumption of raw, unsafe animal products. Brucellosis and tuberculosis (TB) are just some examples of the important linkages between animal health, human health and the need for strengthened diseases prevention and control measures. Animal health services are also limited – there is limited access to animal health professionals, veterinary drugs and diagnostic facilities.

Table 4 lists the most common diseases affecting dairy cattle in the *woredas* covered in the study, as identified by focus group participants.

Trypanosomosis was given special attention in this study because FAO is currently evaluating the access of women and men to prevention technologies in Ethiopia. Trypanosomosis is a group of diseases caused by *Trypanosome* species and transmitted by biting tsetse flies. Trypanosomosis is endemic in vast areas of the country and at a high prevalence rate in the midlands and low-

lands, thus damaging the milk production of small dairy producers.

The impact of trypanosomosis on milk production has been estimated at 50 percent of the total herd milk production in affected herds (FAO, 2013c). In broader terms, the disease has a strong negative impact on poor rural households in terms of:

- lower milk yields and resulting low income and poor nutrition;
- increased work load on women, men and children in caring for sick and weakened cattle.

Treatment with a number of drugs is complex, unavailable in Ethiopia, and relatively expensive for the smallholders. Alternatives are to control the vector (tsetse fly) by trapping it or to protect animals using nets. The latter, a recent introduction, is currently being tested by FAO. Use of the nets in Arba Minch Zuria is described in Box 7.

Mastitis is the inflammation of the mammary gland and udder tissue, and can be a major production disease constraint in dairy cattle, but it can be controlled by good milking hygiene or treated by antibiotics. In addition to the costs of treatment, a one- to two-month interruption in milking was reported by Degem *woreda* key informants.

The tuberculin skin test survey indicates that the prevalence ranges from 0.8 percent in extensive rural farming systems that keep Zebu cattle to 50 percent in intensive husbandry systems Romha (2014). However, there is no programme to control Bovine tuberculosis (bTB) in Ethiopia (Yemane, 2008).

Foot-and-mouth disease (FMD) is a highly contagious disease of the mucosa membranes and the foot tissue adjacent to the hoof. It seldom causes mortality but reduces production in dairy cattle. Outbreaks are still common in Ethiopia. Vaccina-

TABLE 4
The three main diseases affecting dairy cattle in the study sites

Study <i>woredas</i> /Regions	Types of diseases in order of frequency	Effects on production
Degem/Oromia	Foot-and-mouth-disease (FMD)	Loss of weight and production
	Anthrax	Death of animal
	Blackleg	Reduce milk production
Dejen/Amhara	Blackleg	Reduce milk production
	Mastitis	Production loss, teat problem, and abortion
	Lumpy Skin Disease (LSD)	Losses of milk production, body condition and hide quality
Arba Minch Zuria/SNNPR	Trypanosomosis	Reduce milk production and cause abortion
	Blackleg	Reduce milk production
	Mastitis	Production loss, teat problem and abortion

Source: Zone and *woreda* Livestock Offices.

tion is possible but needs to be repeated regularly because it does not confer long-term immunity.

Pasteurellosis outbreaks occur during periods of environmental stress causing 50-100 percent morbidity and mortality.

In Ethiopia, BTB is considered a prevalent disease in cattle populations, although it was not reported as a priority in any of the study sites. Felleke, Woldearegay and UN (2009) found that tuberculosis, brucellosis and listeriosis are major zoonotic diseases in Ethiopia due to their endemic nature in domestic stock and poor prevention measures to reduce the incidence. Different studies and Mahlet (2008) cited in the same source indicated that there is an increase in the prevalence of bovine tuberculosis, particularly in dairy farms engaged in intensive animal husbandry and raising crossbred and exotic cattle. Data obtained from the same source show that in extensive, small holder and intensive dairy farming the mean prevalence of Bovine Tuberculosis is 9.1 percent (75), 8.1 percent (221) and 27.8 percent (1 316), respectively. Similarly, Romha (2014) found that the prevalence of Tuberculosis ranges from 0.8 percent in extensive rural farming systems that keep Zebu cattle to 50 percent in intensive hus-

bandry systems. According to the World Health Organization (WHO, 2014), Ethiopia was ranked 14 among 22 TB high-burden countries. As noted by Felleke, Woldearegay and UNIDO (2009), in four regions of Ethiopia, brucellosis is widespread. Accordingly, infection rates range between 0 and 0.69 percent in different districts of Amhara region, and 0.2 and 5.19 percent of Oromia region, with the highest infection rate evidenced in Southern Nations Nationalities and Peoples Regional State (SNNPR) at 2.46 percent.

Although many of these diseases can be prevented or cured (assuming that the necessary vaccines, drugs or other technology are available), they cause economic losses resulting from lost production and the costs of prevention and treatment.

Stakeholders consulted in this study, including dairy producers and government and non-government representatives, agree on that there are no adequate animal health services at *kebele* and *woreda* levels. They believe that this is mainly due to lack of government attention to the sub-sector and the consequent shortage of budget, skilled human resources, logistics, vaccines and drugs, laboratory facilities and equipment, the lack of an incentive system, and uncontrolled illegal use of

BOX 7

Case study on tsetse fly and trypanosomiasis control in Arba Minch Zuria

The newly established institute for control and eradication of tsetse and trypanosomiasis, formerly known as the Southern Tsetse Eradication Project, is implementing activities through a comprehensive approach. It has used the following technologies: ground spray, target and trap, sequential aerosol techniques and sterile insect techniques (SIT), which is the final biological control for the eradication of flies. Even though these technologies were used and effected a great change in the production and productivity of animals, they are not practical for stall-fed cattle, including zero-grazed dairy cattle. Alternative technologies are required to fill the gap. One technology that has been used for this purpose is the livestock protective fence (LPF), a net fence treated with insecticide around the cattle pen to protect animals from tsetse and other biting flies. This is expected to increase milk and meat production by decreasing defensive movement produced by

flies and making the animals calm and able to feed more. FAO and the National Institute for Control and Eradication of Tsetse and Trypanosomiasis worked in two woredas, one of which was Arba Minch Zuria; in each of which, three kebeles and 90 farmers were selected and LPFs were installed. From the same kebeles, 15 farmers (five farmers from each of the three kebeles) were selected and left without the LPF.

Using the above technology, the following results were found:

- Trypanosomiasis symptoms were observed in the control group but absent in experimental group.
- An increase milk production was measured in the experimental group and less in control group.
- A decrease in defensive movement of cattle in the experimental group during the study period.

Source: Interview with the FAO project "Improving food security in sub-Saharan Africa by supporting the progressive reduction of tsetse-transmitted trypanosomiasis? in the framework of the NEPAD (GTFS/RAF/474/ITA), 2015.

drugs despite the existence of regulation in this regard. As a result:

- laboratories are not functional, so treatment is based on physical observation and can result in the spread of drug-resistant types of diseases;
- there is a lack of commitment among professionals to provide services;
- there is a lack of epidemiological data in the zones/*woredas* and as a result no timely planning for vaccinations, no information about the prevalence rates and seasonal calendars on the occurrences of the major diseases.

Lack of government attention for the sub-sector is reflected in a shortage of essential resources and a dispersal of already allocated resources including livestock production and health professionals to its main focus areas such as crop production, and recently, to natural resource management activities, according to the study informants. According to members of the Ethiopian Veterinary Association (EVA) interviewed in this study, *woreda*-level animal health services are poor mainly due to a lack skilled and committed human resources and there are 1 553 vacancies for veterinarians in the *woredas*, despite the existence of 28-30 percent unemployed veterinarians. The main reason for this paradox, according to the Association, is the lack of willingness among *woredas* to hire qualified veterinarians; instead there is a tendency to hire low profile, least paid AHTs. There is also a lack of an incentives system. Based on the same information sources, vaccination is not serving its purpose partly due to problems mentioned above and partly due to lack of awareness among the community and distribution-related problems. In some cases, limited effectiveness of the vaccines, despite the 19 different types of vaccines produced in the country, affects the effectiveness of the vaccination programme.

Taking animals to the health post and providing drugs for the sick is mostly men's role, but women take on the responsibility in the absence of men. Women are more active in identifying and caring for the sick. There is limited access for health services by men and women, particularly women have limited access for the services due to limited mobility and remoteness of the services.

Given their daily contact with dairy cows, women are in many instances exposed to zoonotic diseases through direct contact with saliva, blood, urine, faeces and milk that are potential sources of infections. While none of the study

woredas mentioned zoonotic diseases transmitted by cattle (brucellosis and tuberculosis), these diseases appear to be prevalent in intensive animal husbandry in Ethiopia (presumably including smallholder zero-grazed dairy cattle), presenting a risk to farm families if they consume milk that has not been boiled or pasteurized, and to family members or animal health practitioners who handle animals at calving.

Since they tend to take care of the daily management of cattle as well as the milking and processing of dairy products, rural women could play a crucial role as regards the monitoring and control of cattle diseases, if empowered and trained on how to recognize and prevent diseases as well as provided with improved technologies for animal health (FAO, 2013d).

Other constraints

In addition to the constraints already discussed, the dairy sub-sector has faced a number of challenges to expanding supply and productivity; those with gender implications are summarized below:

- **Access to information training and education.** Yilma *et al.* (2011) reported that women and poor men generally have access to information from informal sources, while men depend mainly on formal sources. Men from rich and middle-income households have the widest range of formal income sources and the greatest access to formal training,
- **Access to technology.** Limited access to inputs and support need to invest in intensive production on a small or large scale, including breeding stock, technical knowledge and credit are constraints to all producers. They can be a particular constraint to women, who face greater challenges in accessing inputs than men (cited in UNIDO, 2013).
- **Market-related problems.** Low and seasonally variable producer prices and the limited capacity of processors were reported in all of the study sites, as well as concern over inaccessibility of collection sites and rejected milk. As previously discussed, the latter was a particular concern for women in Degem *woreda*, who were then faced with the extra work of having to process the milk into poor quality butter and cheese.

Reliable Market

All of the above are disincentives to investing in dairy production and affect all smallholder farmers. However, men are more likely to scale up

livestock production and management and then use livestock as a business. Women, with limited access to training, services and credit, are more likely to keep and manage livestock for the immediate welfare of the household (FAO-ILRI, 2011).

3.2.6 The influence of dairy development programmes

Government programmes have strongly influenced dairy development since the 1960s, as previously described in section 3.1.2.

Since 1991, the emphasis has been on providing an enabling environment to encourage private investment from local and foreign investors. Many state enterprises have been privatized (UNIDO, 2009). New cooperative legislation resulted in the formation of many cooperatives including dairy cooperatives. Dairy producer groups and associations also emerged, particularly in locations close to Addis Ababa (cited in UNIDO, 2009). The dairy sector has become more competitive, which has had a positive impact on producer prices in peri-urban areas supplying the Addis Ababa market, but less so in rural areas. Development projects supported by donors have included the following:

- a) The Dairy Rehabilitation and Development Project (DRDP), Sellale Peasant Dairy Development Pilot Projects (SPDDPP) and the Smallholders' Dairy Development Project (SDDP). The Finnish International Development Association (FINNIDA) implemented the SDDP with additional funding from FAO and WFP covering two districts during 1991-1994 and 16 more districts during 1995-2000. It organized small milk processing and marketing units, and formed about 30 cooperatives in the peri-urban areas of Addis Ababa (Tamconsult, 2008).
- b) SNV Ethiopia through the Business Organizations and their Access to Markets project (BOAM currently succeeded by EDGET), which has carried out a number of value chain studies and assisted in the formation of the Ethiopian Milk Producers and Processors Association (EMPPA). It has also provided training to private companies, cooperatives and private milk collectors, and funding for business plan development for new entrants in the sub-sector. However, BOAM had no clear gender strategy whereas EDGET has a strategy to encourage the entrepreneurship of women and youth in the rural milk value chain focusing more particularly on female-headed households.

- c) Land O' Lakes Inc. (Lo'L), funded by United States Agency for International Development (USAID), which focused on milk shed development, stimulating business development, strengthening market linkages and supporting industries with technical assistance, procurement and artificial insemination services. It has also supported the Ethiopian Animal Feed Industry Association (EAFIA).
- d) Improving Productivity and Market Success (IPMS) of Ethiopian Farmers, a Canadian-funded project is engaged in value chain development. According to Aregu *et al.* (2010), the IPMS project intervention in Ada' Liben Pilot Learning *woreda* has provided training to both husbands and wives to enhance the role of women in knowledge-based commercial dairy production. This has resulted in a measurably more equal division of dairy work among household members.
- e) FAO's recent activities, which include encouraging the commercialization of small-scale farmers in areas with recognized market potentials. FAO has integrated gender equality in its policy and programmes as a guiding principle, which is central to its mandate to achieve food security for all and improve the lives of rural populations. FAO recognized that its objectives are achieved only if it works towards gender equality and supports women roles in agriculture and rural development.

Other relatively recent projects such as East African Agricultural Production and Productivity (EAAPP), AGP (the Government), LMD (USAID), FEED I and II (ACDI/VOCA), EDGET (SNV), LIVES (ILRI) also contribute to the development of the dairy industry in the country:

- EAAPP Federal Cooperative Agency (FCA) focuses on the promotion of cooperatives and capacity building.
- AGP (the Government) focuses on improving livestock market, including the development of the dairy industry.
- LMD (USAID) focuses on the middle of the value chains, cooperatives, unions and organizing platforms.
- EDGET Project (SNV) works with small-holder farmers focusing on the dairy business and marketing.
- LIVES Project (ILRI) (CIDA-supported) focuses on increasing economic wellbeing of male and female smallholders.

- FEED II Project (ACDI/VOCA) (USDA) focuses on input suppliers and supports the establishment of feed processing plants.

All of the above are ongoing projects/programmes; their impacts have not yet been assessed. However, in interviews with SNV, EDGET, ILRI, LIVES, LMD project and ACDI/VOCA FEED II, their representatives state that these projects have worked with the target communities to make women 30-50 percent of their project beneficiaries.

Project and programme support at Degen *woreda* is summarized in Figure 7 for each link in the value chain. The Government provides extension services, animal health services, vaccination, drugs and artificial insemination services. Projects such as SDDP provide processing facilities, instruments and milk containers, construct collection shades and support the establishment of cooperatives. Development agencies provide financial, material and technical supports for the dairy cooperatives.

3.3 VALUE CHAIN GOVERNANCE

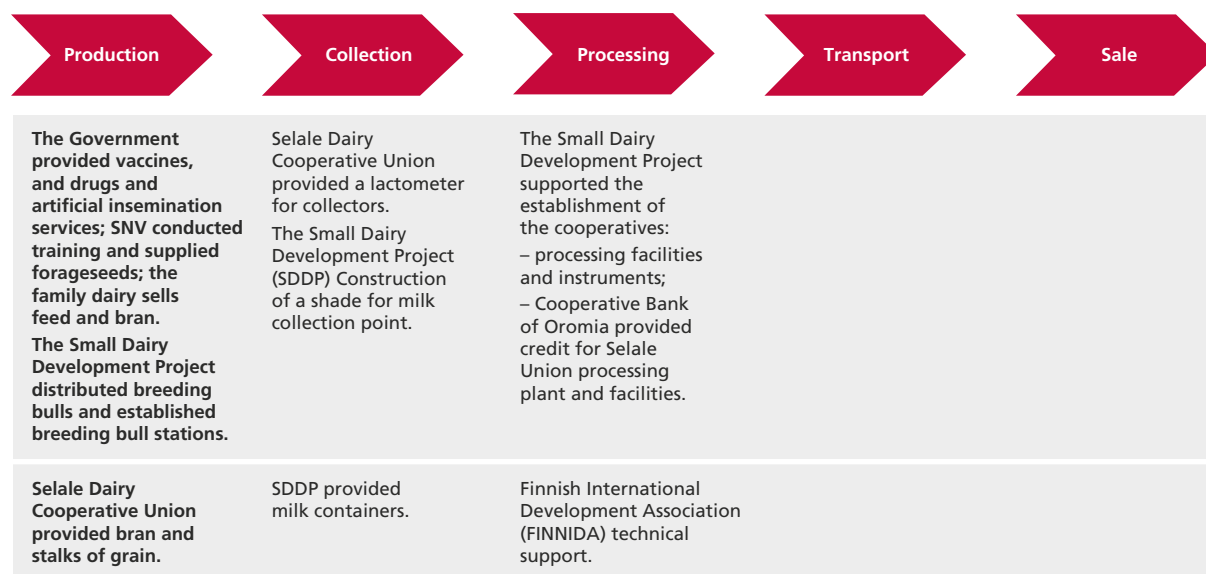
3.3.1 Contractual relations along the value chain

Within formal dairy value chains throughout the country, there are formal, written agreements between producers, processors and traders. They take the form of card-based contractual systems

between producers on one side, and processors and traders, on the other. Usually a man signs a contract agreement being the head of a household, but in his absence, women can take on the role. Based on the information obtained from FGDs and key informant interviews, the effectiveness of the agreement and use of income do not depend on who signed the contract. In this type of contract, producers make a commitment to supply a certain amount of milk on a daily basis to collection points where agents of the processors and traders collect and bulk the milk for transport to the chilling/processing centres. The processors also have contractual agreements with milk traders who are engaged in collecting and bulking the milk. The traders collect milk from the farmers and supply milk to the processors based on the contractual agreements made. The contract agreements usually specify the amount of milk supplied, which are recorded daily on record cards, noting the terms and condition of quality and payments schedules. Acceptance or rejection of the supplied milk is based on the results of milk quality tests. Payments are usually scheduled to be effected in 15 days, which is similar for all processors and traders, with the exception of the Chamo Hyque Wotet Amrachoch Dairy in Arba Minch Zuria *woreda*, which effect payments every month. Failure to supply milk may not entail a penalty,

FIGURE 7

Support to Ano Degen dairy value chain



Source: Results from this study, 2015.

but failure to pay for supplied milk could be subject to legal proceedings.

Processors also have contract agreements with retailers such as supermarkets, dairy shops and kiosks. The payments at this level are mostly on a cash basis; however there are also payments on a credit basis payable in 15 or 30 days.

There are also contractual agreements between credit services providers and borrowers such as producers, traders, processors and retailers. Value chain actors need credit to facilitate their business activities and obtain it from financial institutions such as banks, microfinance institutions (MFIs) and saving and credit cooperatives. These financial transactions are usually governed by contract agreements that commonly include the size of the credit, terms of payment, collateral and rate of interest, etc.

3.3.2 Organizations and individuals influencing the performance of the value chain

Dairy value chains are emerging with the active participation of a growing private sector and cooperative societies, and a declining role of the Government. Currently, the private sector has the dominant power to influence the performance of formal value chains. For instance, it is the private processors who set the quality standards at the collections centres, determine the volume of milk marketed and fix farmgate prices for fresh milk, processed milk and other dairy products. Currently, the role of the Government in the dairy value chain is limited to creating a conducive environment through policy and regulatory instruments, research and technology adaptation, and providing extension and animal health services, and other capacity-building supports for the value chain actors. Hence, the Government is currently not involved as a commercial actor in the value chain and has a limited role in value chain governance.

Dairy producers in Ethiopia are mostly smallholder farmers and usually not organized. They need an enabling environment to increase their level of competitiveness to produce quality products and seek new market opportunities that offer higher level of income. These goals can be achieved through better economic coordination among producers' organizations. Farmers' organizations can play a key role of organizing economic activities beyond local boundaries. They can strengthen relationships with various value chains actors, obtain commitments from various actors to cooperate on mutually beneficial actions,

and obtain investments, and thus reinforce the links among the actors along the chain. Cooperatives are currently important players in the dairy value chain although their roles in the value chain governance are limited due to gaps in management and financial capacity.

It is challenging for smallholder farmers' organizations and even more for individual farmers to understand market demands and develop their skills and capital requirements to supply the required volumes of quality product at the right time and benefit from the value chain. In this regard, cooperatives in the study sites particularly in Dejen and Degem *woredas* have created a market for milk and supply feeds for their members. For instance, in Dejen *woreda*, the only market outlet that exists for the milk product is that created by cooperatives, and there was no other alternative. The dairy producers sell their milk to and get factory feed (by-products) from the cooperatives. In Degem *woreda*, cooperatives and the Union serve as market outlets for members. Producers gain a voice by joining cooperatives, but the cooperatives are weak in management and collection capacity.

Government policies and development projects providing capacity-building supports for smallholder producers and their organizations (cooperatives) as well as other value chain actors have positive impacts on enhancing their competitiveness and involvement in value chain governance.

3.3.3 Participation of men and women in value chain governance

Women and men both participate in the governance of dairy value chains in Ethiopia but not to the same extent.

Producers are limited to production and selling their produce. They may decide on how much to sell, but it may be difficult for them to decide on to whom to sell and at what price, to control the terms of payment, define the grades and standards, target consumers and manage innovation, and so on. The production level is a broad base where a large number of men and women participate in the dairy value chain as actors but with no influence over decisions and management of the chain.

As indicated in the literature and in information obtained from the study sites, women's involvement decreases further downstream in the value chain, that is, in processing and consumption. Furthermore, they are limited in number at the decision-making positions of major value chain actors such as processing enterprises, where

decisions are made that can have an influence along the whole chain. The limited membership of women in the cooperatives and their insignificant or lack of management positions are also an indication of the marginal position they hold in the value chain governance.

According to *woreda* Livestock Offices and Women, Children and Youth Affairs Offices, there is a changing trend in all aspects of gender equality, especially at the household level. However, based on the data from the same sources, it is not uniform in all *kebeles* of a *woreda*. Gender equality is stronger in the highland *kebeles* but lagging behind at the lowland *kebeles*. Also, progress observed in the highland areas is limited to the household level (micro level) but not at the institutional level (community and cooperatives). For example, there is not a single woman from 14 AHTs in Degem *woreda* and only 12.5 percent (one out of eight) and 13 percent in Dejen and Arba Minch Zuria *woredas*, respectively; only 25 percent of women are AHTs in both Degem and Dejen *woredas* and 39 percent in Arba Minch Zuria *woreda*. The share of female membership in agricultural cooperatives is 10 percent, 15 percent and 21 percent in Degem, Arba Minch Zuria and Dejen *woredas*, respectively. Similarly, in dairy cooperatives, it is 15 percent, 20.5 percent and 30 percent in Dejen, Degem and Arba Minch Zuria *woredas*, respectively (Table 5). Federal Cooperative Agency representatives interviewed in this study were aware of the imbalance between men and women in the cooperative membership and benefits. This is mainly due to bias in cooperatives law and practices that have promoted one member (a head, usually a man) from a household. This needs to be adequately addressed in ongoing cooperative law reform. According to the infor-

mation obtained from the Federal Cooperative Agency (FCA), there is hope of seeing gender sensitive law that promotes membership of both men and women in the near future.

According to information obtained from Degem *woreda* Cooperative Promotion Office and SNV-EDGET project, there is a considerable number of women members but they are not active. It is men who participate in technology adaptation and capacity-building training, take milk to collecting points and receive the payment. Women rarely participate in technology adaptation and capacity-building training organized by government and development agencies, as confirmed by FGDs and households interviewed. Men usually participate in capacity building, awareness creation, technology promotion and adaptation training despite women's dominant roles and responsibilities in dairy production. Women have the opportunity to participate if the training is organized at the villages or *kebeles*, and/or if they are heads of households. Women are not allowed by men, or are unwilling to participate in training and exposure visits organized at *woreda*, zone, regional and national level, especially when it requires passing nights outside their home. Limited women's participation also results from the traditional thinking of development agencies and their staff, who organize training and exposure visits and invite the male household head, considering him the sole responsible for all the commitments that the household is making. It was clearly observed from the *woreda* action plans and monitoring and evaluation reports that they focus only on household heads, who are usually men in male-headed households and women in female-headed households. Hence, women in male-headed households are largely ignored and

TABLE 5
Male and female membership in agricultural cooperatives in the study *woredas*

Region/ <i>woreda</i>	Type of cooperative	Membership				
		Men		Women		Total
Oromia/Degem	Multi-purpose	9 526	(90%)	1 067	(10%)	10 593
	Dairy	205	(79.5%)	53	(20.5%)	258
Amhara/Dejen	Multi-purpose	14 913	(78.8%)	4 013	(21.2%)	18 926
	Dairy	353	(85%)	63	(15%)	416
Southern Nations Nationalities and Peoples Regional State (SNNPR)/ Arba Minch Zuria	Multi-purpose	7 107	(84.2%)	1 271	(15.2%)	8 378
	Dairy	28	(70%)	12	(30%)	40

Source: *Woredas* Cooperative Promotion Offices.

excluded from all planning exercises at the lower level of government structures.

Women's institutions in one of the sampled study *kebeles*, Ano Degem, failed. In this *kebele*, there were three dairy cooperatives established with technical, financial and material support from SDDP projects and the Government. Three dairy cooperatives were organized; one for women-only, Ali Doro, which failed and became non-operational shortly after its establishment, while the other two with mixed male and female members are still operating. The main reason for the failure as noted by the *kebele* key informants is the lack of management capacity, limited available time and lack of interest among women to assume responsibilities and work at the institutional level.

There is another illustrative case that supports the above argument, the Tumano Abdi *kebele* *Burka Gudo* women-only dairy cooperative in Degem *woreda*. One of its members, who is a secondary school graduate, requested the *woreda* Cooperative Promotion Office to transfer her membership rights to her husband to replace her in the women-only cooperative. This was not only the intention of a single member as reflected here, but the option was also shared among all members of the cooperative. This was observed during the field visit to the cooperative to interview milk collectors while on duty. All the functions of the cooperative, including collection, purchase, quality control, sales, accounting, and collection and disbursement of sales money to the members are carried out by men except for a nominal chairperson position held by a woman. According to the informants, the reason for this is that women are busy with other duties around the homestead and are not willing to serve in the cooperative. Hence, this can be seen as one of the indications that women tend to stay behind and focus on activities around homestead. Therefore, at the meso level, there is wide gap in participation by men and women as well as in gender equality.

There is also a lack of collaboration among the DVC actors. For example, there is no strategy by the milk collectors and processors to support quality milk production and supply by farmers – they simply respond to poor quality supply by rejecting milk. This trend also contributed to the failure of the women-only dairy cooperative, according to an informant at the WCYA Office.

According to Degem *woreda* Cooperative Promotion Office, dairy cooperatives are few and have weak capacity. Out of 18 agricultural cooperatives, only four are dairy cooperatives, with a

total membership of 258 (53 women). They are weak for several reasons, which include:

- lower milk price paid by cooperatives compared to private collectors and processors;
- unsuitable collection time, from 6:00 a.m. to 6:30 a.m., which is difficult to manage for the farmers who come from distant areas to the road side collection points. Private collectors and processors collect until 10:00 a.m.;
- cooperatives only collect along the main road but private collectors and processors also collect from remote *kebeles*.
- frequent rejections of supplied milk due to stringent quality controls compared to milk from private collectors. According to information acquired from cooperatives' sources, they are weak in Degem *woreda* because most members tend to supply their milk to private collectors/processors rather than their cooperatives/union. This is mainly due to widespread adulteration practices in the area allowed by individual private collectors who collect adulterated milk, especially during seasons of milk scarcity.

There are very few women members of cooperative boards and they are not active. This is mostly due to traditional gender roles that encourage men to participate in social and economic activities at the institutional and community levels, and encourage women to assume more responsibilities at the homestead.

3.4 SCALABILITY OF GENDER SENSITIVE DAIRY VALUE CHAIN DEVELOPMENT

The dairy sub-sector is dominated by smallholder production and low productive breeds. It also faces challenges of low consumption, seasonal demand and supply. Scalability of dairy value chain development could consist of either or both of the following:

- a) Scaling up: increased development and efficiency of existing formal value chains, which could include carrying out certain activities (notably processing) on a larger scale to benefit from economies of scale.
- b) Scaling out: spreading dairy value chain development into a larger number of potential areas across Ethiopia so that more communities can become involved. This could be expected to result in a greater influence of formal value chains in areas where the milk market is currently predominantly informal.

There has already been some development of formal value chains through investment by the private sector, the Government and NGOs. One of the study *woredas*, Degem, has a very well-developed value chain in which smallholders participate. Dairy value chain development has focused on milk-shed areas close to major cities, particularly Addis Adebaba. It could be replicated in other areas but would require investment in interventions to improve breeds, feed availability and animal health services, management skills among the producers, processing facilities and market linkages.

However, there are gender implications in scaling-out of formal value chains, even when they emphasize the participation of small-scale producers, traders and input suppliers.

- The participation of producers in formal value chains tends to be associated with more intensive production. Although in this case, women's workload was not increased, there needs to be conscious efforts to prevent this negative impact, as in the IPMS project (see section 3.2.6). It also would require more animal health services, which women do not find easy to access.
- Formal value chains tend to work most effectively when farmer groups and cooperatives play a major part in their governance, often by managing key collection and processing facilities. As discussed in section 3.3, the participation and influence of women in these institutions have been very limited in Ethiopia.
- The development of formal value chains offers an opportunity for both women and men to establish businesses to supply feed and health inputs or engage in trading. However, this requires them to have access to knowledge, training and credit, which women and poor men find hard to access. Without such supports and better capacity-building interventions, there is a risk of excluding small-scale farmers from participation, particularly women, and from the resulting benefits in the subsector.

There may be even greater gender implications in scaling-up. Scaling-up of production is challenging because of land and feed constraints, so it is likely to be restricted to a small number of producers. Similarly, scaling up of processing or service provision may result in these functions being controlled by a limited number of individuals who are in a position to access credit and take financial risks. These issues are not unique to dairying or to Ethiopia, but they are important issues for a sub-sector that is currently being promoted as potentially beneficial to women.

Chapter 4

Conclusions and recommendations

4.1 CONCLUSIONS

There is scope for expansion of dairy production in Ethiopia. While consumption per capita is small, it has grown during the past ten years as a result of increasing wealth in the urban population. This combined with a growing human population leads to the steady growth of total demand, which is predicted to continue growing. Although production has also increased, recent growth of population with approximately estimated 3 percent per year has not caught up with years of supply deficit. During the past decade, Ethiopia has imported between 2 000 and 4 000 tonnes of dairy products annually.

An increased supply of milk would best be achieved through gradual increases in the currently low average productivity per animal, since there are land and feed constraints to expanding cattle numbers. It would require not only investment in dairy cattle production systems, but also and importantly, investment in processing facilities and transport to create market links between producers and urban markets. Processing would be important to reduce the impact of seasonal demand for dairy products, which implies that a higher percentage of milk would need to pass through formal dairy value chains, since they offer greater opportunities for food safety assurance and economies of scale in processing than informal channels.

This shift would need to be managed carefully to promote gender inclusion. Dairy industry development is often promoted as an activity offering benefits to women as well as men, but the benefits cannot be assumed. This study found that women actively participate in small-scale milk production and informal processing, and have opportunities to control the income from both or to influence its use. They have considerably fewer opportunities than men to invest in larger, intensely-managed dairy herds or the small businesses that might contribute to a formal value chain, because their access to credit and relevant

technologies is limited, hence, few women have been able to benefit from the new opportunities that arise when value chains expand. Also, since they are highly under-represented in governance institutions such as management committees of cooperatives that control milk collection or own processing plants, they have limited influence over how value chains are structured or operate. While government policy is intended to be gender sensitive, it has not been effective in influencing local institutions or customs. However, some dairy development programmes have taken steps to promote the participation of women and men, using approaches such as setting and monitoring gender targets, organizing training activities to benefit both women and men, and encouraging husband and wife teams. This study has also found examples of women who own dairy-related private services and small-scale processing businesses.

While it is possible to make general statements about gender inclusion, it is also important to be aware of local variations, influenced by location (remoteness, climate) and ethnicity. Three locations were reviewed for this study, each providing different insight into dairy development.

One study site, Degem *woreda* in Oromia, has a relatively highly developed formal value chain in which smallholders participate. It shows a possible future for many communities within reach of large towns, where more than 50 percent of milk passes through formal channels and where local seasonal fluctuation in milk prices is cushioned by access to the Addis Ababa market. However, women and girls in remote (off-road) *kebeles* have limited access for collection points and cooling facilities, hence limited market for fresh milk. Women farmers in some accessible *kebeles* of this *woreda* indicated that expansion of their herds (land and feed permitting) would not have a negative implication for their workload because very little milk is home-processed and labour can be hired. In this situation, the priorities for gender sensitive development might include: (i) increasing wom-

en's involvement in activities where they are not strongly represented such as formal processing, retail and service provision, which would require scientific and technical training; (ii) promoting more equal participation of women and men in the long-established cooperatives that govern the value chain; (iii) ensuring equal access to training and input services that are needed to increase the size of small dairy herds or make them more productive; and (iv) supporting access for collection centres/points and cooling facilities by women in remote (off-road) *kebeles*.

Arba Minch Zuria *woreda* represents a very different situation, an area where milk production barely meets local demand and marketing is mostly informal. The area has been less influenced by government and external investment than Degen *woreda*, and it does not have the strong incentive of proximity to large central urban markets such as Addis Ababa that would drive the development of a formal value chain. However, increasing private investment and externally funded development projects are likely to provide opportunities to decrease the effects of diseases, increase production, productivity, and shift towards processing into long shelf-life dairy products. In any future development of dairy value chains, it is important to ensure that small-scale or informal processing and sale enterprises currently managed by women are not displaced by new, formal enterprises, and that they are provided with training and other support to engage in new activities as they developed. It is also important to establish new market links simultaneously with increased productivity in order to avoid negative impacts on producers from falling farm gate milk prices.

Dejen *woreda* illustrates a situation where there is already a formal value chain – most urban consumers obtain their milk from primary dairy cooperatives – but the local market for milk is limited, with prices in this *woreda*, showing the greatest seasonal fluctuation of all three study sites. Further development of the value chain in this situation would require increase in production, a larger milk market, probably through stronger links to a large urban market and strengthened local processing capacity to increase milk shelf-life. It was reported that many couples in this *woreda* work closely together in dairy production, which could provide a good basis for continued gender inclusion if dairy herds expand or become more productive. The formal value chain is mostly cooperative-driven, implying that gender sensitive development of the

chain would need to emphasize the role of women in cooperative management as well as technical roles.

4.2 SITE-SPECIFIC RECOMMENDATIONS

In addition to the more general points made in the previous section, the following are site-specific recommendations for the development of gender sensitive dairy value chains.

1. Degen *woreda*, Oromia Region

- Facilitate equal access for women and men to training and input services that are needed to increase the size of small dairy herds, dairy cow and their products management knowledge (including quality milk production and marketing).
- Improve access of infrastructure such as collection centres/points and cooling facilities and hence markets for women and girls in remote (off-road) *kebeles* in the *woreda*.
- Enhance women's involvement in activities where they are not strongly represented such as quality control, training and extension services, collection and formal processing.
- Promote equal participation of women and men, and empower women in their management and leadership roles in cooperatives.

2. Arba Minch Zuria *woreda*, SNNPR

- Promote and strengthen private investment and development projects interventions to decrease effects of diseases, increase production and productivity then processing, ensuring that women as well as men have access to the services and technologies provided.
- Consider the importance of small-scale private trading and processing enterprises currently managed by women and consider them as a vehicle for future development of gender sensitive dairy value chains.
- Equip both women and men with required knowledge and technologies to protect and treat dairy cow from common diseases in the area, and increase production and productivity.
- Design new marketing strategies while increasing productivity in order to avoid negative impacts on producers from falling farmgate milk prices.

3. Dejen *woreda*, Amhara Region

- Promote and strengthen private investment and development projects interventions to enhance dairy production and productivity.
- Improve access of women to technical training, improved inputs and technologies.
- Facilitate market linkages through strengthened local processing capacity to increase milk shelf-life and improved cooling and transport facilities which are accessible for both women and men.
- Empower women and build their capacity through provision of trainings, creating opportunities to increase their roles as members and leaders in dairy cooperatives.

Chapter 5

Important considerations when developing gender sensitive dairy value chains

The previous chapter concluded that dairy value chain development is inevitable and could be beneficial but must be managed carefully if it is to be gender sensitive. Points in this chapter may be applied to ensure the development of dairy value chains in Ethiopia in a gender sensitive manner. They are intended as a companion to technical recommendations on the sustainable development of dairy value chains, not a substitute. Unlike the recommendations in chapter 4, which are to some extent site-specific, the following points are more generic:

a) Support traditional family farms in improving their integration into the market system. Since women's empowerment is vital for sustainable gender sensitive dairy value chain development, as a matter of principle, projects supporting the development of gender sensitive dairy value chains need to facilitate equal access for both men and women to training, technology, infrastructures and credit.

b) Promote sustainable business models for successful interventions in value chains. This requires the various actors in the chain to be able to make a sufficient profit. After an initial period of assistance, each of the actors in the chain must be able to act on their own, without continuing, long-term external subsidies or other form of support. Smallholders must be able to meet market conditions. A business model that does not generate sufficient profit on a sustainable basis for each of the actors, or that relies on continuous external support, is doomed to fail in the long term. Therefore, a strategy to promote dairy value chain development must focus on building organizational and management skills. Within this context of successful value chain development, gender inclusion entails ensuring that the economic gains in value chains are fairly distributed among the various value chain actors, including men and women. It is necessary to take into consideration

aspects such as return on investments and bargaining power of the various actors, especially women.

c) Ensure that policy is supportive. Ethiopia has a gender policy adopted in 1994, which has not been amended for the last 22 years. There have been tremendous changes in the socio-economic and cultural contexts in the country since its adoption. There is a need to update the policy to accommodate recent developments in the area to respond adequately to the following emerging gender issues:

- Dairy sub-sector policy must be adapted to consider gender issues. This applies to policies for the dairy sub-sector in general and specific components such as breeding policy and making land available for producers through policy change.
- Cooperative policies must be gender-sensitive. The current legislation and practices that promote membership of one person (a head, usually male) in cooperatives need to be addressed to give equal opportunities for both men and women, including women in male-headed households.

d) Women and men should both play a part in organizations that are critical to value chain governance, such as farmers' organizations/cooperatives and self-help groups. Establishing smallholder dairy producers' primary cooperative and subsequently dairy unions is an appropriate strategy for value chain development. There are examples of well-functioning farmer organizations in areas around Addis Ababa that can provide examples for ways of establishing functional and profitable farmer organizations. Lessons learned from other countries such as Kenya show that farmers' organizations can do much more and serve as business hubs to provide all required services and inputs. However, it is critical to put into place measures to ensure that women will be members and leaders of such organizations. In order to

increase the number of female cooperative members and women in management/leadership positions, as well as build successful women-based dairy cooperatives, associations and enterprises, there is a need for intense capacity building that enhances their awareness of the benefits of cooperation; membership duties, responsibilities and benefits; communication, negotiation, advocacy, and management skills. Such capacity-building support should be accompanied by the provision of time- and energy-saving technologies and services for women to save time from their heavy workload so that they decide to assume additional responsibilities and effectively carry them out at the community and association/cooperative level. Furthermore, encouraging family members to take on a fair share of household responsibilities and tasks is of paramount importance for empowering women.

e) Men and women should be involved in the design and development of value chains. There are a number of key areas where men and women make joint decisions, which can be used as a basis in designing interventions for developing a gender-sensitive dairy value chain. Approaches may need to be locally specific; for example, this study found that in one *woreda*, men and women were increasingly taking joint decisions about dairy cow management, while in another, activities were decided upon separately. A key to involving both men and women in the design and development of value chains is to use households as an entry point. The household is an important unit in capacity development, coaching and mentoring and technology adoption for market-oriented smallholder dairy producers. The main issue in achieving this is involving both men and women together, particularly women in male-headed households, often a neglected group.

f) Provide training that targets vulnerable households, including those headed by women. Vulnerable households may find it difficult to benefit from new market opportunities. Even if they have the necessary information, other constraints may prevent them from benefitting from such opportunities, such as limited technical skills and knowledge in quality dairy production and management, and access to credit. Hence, they need adequate credit to invest in the dairy business and training on dairy and financial management skills.

g) Ensure access to credit. Access to credit is critical for producers to be able to use modern

technologies, but often acts as a barrier for women and poor people, and, consequently, they tend to be excluded from the technology development process. Inadequate loans provided by financial institutions for dairy investment, limited access for the resource-poor, particularly women; short terms of loan maturation, and inappropriate payment schedules can all be addressed by allocating revolving guarantee funds and negotiating with financial institutions. There are good examples of lessons learned from in the country, such as cooperative capacity-building programmes in Self Help Africa where cooperatives had been effectively linked with private and cooperative banks for operation and investment cost through guarantee funds as collateral for loans allocated by the projects.

h) It can be useful to facilitate the establishment of women's self-help groups. Self-help groups, micro and small-scale enterprises for dairy processing and marketing are essential to promote greater involvement of women in these activities. The initial support may include: the raising of awareness and common understanding among the members on the needs and benefits of collective actions; identification and mobilization of own resources; provision or facilitation of access for credit services, processing facilities and equipment; training on quality dairy products handling, hygiene and sanitation; market linkages for inputs and outputs; and supports towards a long-term vision for a group enterprises.

i) Gender equality should be addressed in all parts of the value chain. The following are specific suggestions related to value chain functions:

- **Production.** It should be taken into consideration that there are possible implications for women's workloads when expanding dairy production, but they will be affected by local circumstances. Scaling-up may not be a problem for women if most milk is sold fresh and labour is available to hire. When designing an intervention in dairy production it is important to analyse implications on workload.
- **Collection.** The action of pooling of milk collection and transportation activities has the potential to mitigate the cost and enhance integration of producers into the value chain. Men's and women's involvement in collecting and/or trading dairy products can be enhanced by organizing groups/cooperatives

(women only or mixed) in remote *kebeles*, which are not linked in regular milk transporting system and equipping them with cooling facilities that use solar energy. Furthermore, training and equipping women on quality control would enable them to better deal with collectors to increase their bargaining power and have a better control over the value of their product.

- **Processing.** To address a generally low level of involvement of women in milk trading and processing, geographical location of chilling and other processing facilities is important. They need to be close to villages so that women can access them. As previously mentioned, women should be encouraged to be members and empowered to be leaders in cooperatives and group enterprises through focused and continuous training and support in accessing and applying energy- and time-saving technologies. Women-only groups and cooperatives need special support when they are established to avoid the failures that occurred in one of the *kebeles* in Degen *woreda*.
- **Distribution and retailing.** This can be carried out on a small- or large-scale basis within formal dairy value chains. For women to gain full benefit, they need access to credit and training on sanitation, and on hygienic milk handling that allows them to set up small businesses that provide sufficient income to compensate for the time they spend away from home.

j) Participatory planning and monitoring and evaluation plans need to be put in place. These plans should be clearly laid out and have targets with attainable and measurable gender-sensitive indicators that would include the successful operation of the value chain as well as participation by women and men. Indicators should be developed together with all key stakeholders. Periodic M&E, sex-disaggregated data collection, recording and analysis, reporting, feedback and follow-up systems that recognize and reward good achievements and take corrective actions on poor performance and ensure accountability should be put into place.

Specific actions could include:

- the establishment of a baseline for all indicators identified in the M&E plan, using sex-disaggregated data;
- regular reporting against all indicators defined in the M&E plan;

- a periodic review of the dynamics of social, cultural and economic variables that contribute to gender imbalances in the production, processing and commercialization process of the dairy production system;
- an evaluation of impacts on and implications for women and men when introducing technology proposals to reduce or prevent negative impacts of the project on women and men.

Concrete examples of good practice

- Women in areas with chilling plants have experienced increased mobility to access value chain services (input dealers, livestock health workers, milk collection points) compared to those in the areas without a chilling plant (Quisumbing *et al.*, 2013).
- A focus on strengthening women's empowerment resulted in increased women's participation in the dairy value chain by locating fixed milk collection facilities closer to producers within the villages.
- Women and girls are involved in taking milk to collection centres and collecting money if the milk collection centres are accessible within short distances from their villages (FGDs and household/individual informants in this study).
- A project that equally involved wife and husband in the training has resulted in a substantial change in the division of dairy work among household members (Aregu *et al.*, 2010).

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Annex 1

Respondents by type, organizations and sex

Organization	Men	Women
Government Federal Ministry to <i>woreda</i> office	39	7
Producers	61	30
Cooperatives	14	2
Traders	4	6
Distributors (supermarkets)	1	1
Research institutions	5	-
Associations	2	-
Processors	2	1
NGOs	2	2
Drug seller	4	1
Feed dealer	4	-
TOTAL	138	50

Annex 2

Programmes that contributed to the development of the dairy sector

Summary of major past, recently completed, current and pending key interventions in the Ethiopian dairy sub-sector

Key actor/project	Main actions
Past	
United Nations Relief and Rehabilitation Administration (UNRRA).	Introduction of 300 Holstein Friesian and Brown Swiss dairy cattle in 1947.
The Ethiopian Government Government of Finland The United Nations Capital Development Fund	Increasing the processing capacity of the Sholla plant to 60 000 litres per day, introduction of butter oil recombination capacity, establishment of 30 collection kiosks and 16 chilling centres, and expansion of milk collection routes to 150 km around Addis Ababa.
The Ethiopian Government/Ministry of Agriculture and Rural Development (MoARD)	Establishment of a milk processing plant at Sholla.
The Ethiopian Government/MoARD	Establishment of the Dairy Development Agency (DDA) in 1971 to provide guidance and assistance (extension and credit services, establishment of commercial dairy farms, improve quality and increase quantity of milk and milk products, cooperative formation for commercial agricultural production).
The Ethiopian Government/MoARD	Establishment of the Dairy Development Enterprise (DDE).
Swedish International Development Agency (SIDA) supported Chilalo Agricultural Development Unit (CADU)	Introduction of a one cow unit dairy development package, production of frozen cattle semen and crossbreed dairy heifers, the introduction of small-scale milk processing units, the introduction of artificial insemination and bull station services, and extension of improved forage cultivation.
Wolaita Agricultural Development Unit (WADU) funded by the International Development Association (IDA)	Establishment of a farm with 290 dairy cattle at Wolaita Soddo.
Finnish International Development Association (FINNIDA) implemented the Smallholder Dairy Development Pilot Project (SDDP) with additional funding from FAO and World Food Programme (WFP)	Organization of small milk processing and marketing units. Formation of 30 cooperatives in the peri-urban areas of Addis Ababa. Improved veterinary and breeding services, promotion of forage and feed production.
Recently completed	
Land O'Lakes (Lo'L) – Ethiopian Dairy Development Project	Milk value chain development.
Netherlands Development Organization (SNV) – Business Organizations and their Access to Markets (BOAM)	Milk value chain development through its BOAM programme.
Improving Productivity and Market Success (IPMS)	Milk value chain development.

Existing (with their past and current intervention)

The Ethiopian Government/MoARD	Provision of structured extension services.
Ethiopian Meat and Dairy Technology Institute (EMDTI) (MoARD)	Provision of tailor-made trainings on different aspects of dairy development
National Artificial Insemination Centre (NAIC) (MoARD)	Importation, production and distribution of semen to its nine sub-centres. Capacity-building training.
Federal and Regional Agricultural Research Institutions with the Holetta Agricultural Research Centre (HARC) of the Ethiopian Institute of Agricultural Research (EIAR) being the centre of excellence for dairy research	Adoption and generation of appropriate technologies for dairy development Capacity building by organizing and providing training. Verification and demonstration of promising technologies on farms with the participation of smallholder farmers.
Agricultural Universities, Colleges and Schools	Provision of long- to medium-term training on a regular basis to high-level agricultural professionals. Capacity building – tailor-made, short-term training.
National Veterinary Institute (NVI)	Production and distribution of veterinary vaccines and drugs.
Medium- to large-scale private milk processors with the Sebeta Agro-Industry (Mama) as the pioneer	Production, collection, processing and distribution. Producers were offered a better milk price as compared to that paid by DDE, thereby stimulating competition and contributing to the expansion of the formal market.
FAO Subregional Office for East Africa and Country Office	Milk value chain development through the 'Crop diversification and marketing development' project. Need assessment studies.
Primary Dairy Cooperatives and Dairy Cooperative Unions	Access to milk market outlet and dairy farm inputs to smallholder producers. Link producers with processors.
Addis Livestock Production and Productivity Improvement Service (ALPPIS)	Importation of unsexed and female sexed semen, distribution, follow-up and capacity building (training)

Upcoming

Livestock Growth Project (AGP)	Dairy value chain development.
East Africa Dairy Development (EADD)	Dairy value chain development.
Market-led Innovation and Learning for Dairy Development (MIDD)	Dairy value chain.
Livestock and Irrigation Value-Chains for Ethiopian Smallholders (LIVES)	Dairy value chain development.
The private sector	Dairy value chain development.

Source: Yilma *et al.*, 2011.

**Gender assessment of
dairy value chains:
evidence from Ethiopia**

The present study is a gender assessment of the dairy value chain in selected sites in Ethiopia: North Shoa Shewa (Degem *woreda*), East Gojam (Dejen *woreda*) and Gamu Gofa Arba Minch (Arba Minch Zuria *woreda*). It relies on evidence gathered through fieldwork complemented by a review of specialized background documentation. The findings confirm that women's empowerment is vital for sustainable dairy value chain development and that projects supporting dairy production need to increase their efforts to be gender inclusive. The study provides country-specific recommendations for Ethiopia, which also feed into a more general knowledge base on how to develop gender-sensitive dairy value chains.

Food and Agriculture Organization of the United Nations (FAO)

Viale delle Terme di Caracalla, 00153 Rome, Italy
www.fao.org

