

Commercialization of Smallholder Dairying and Its Implication for the Socio-economic Status of Women in North Shewa Zone, Ethiopia

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Abstract

Smallholder commercialization is among the crucial features of the growth and transformation plan in Ethiopia. It is considered as the major pathway from a subsistence agrarian economy to a more diversified economy. With this view in mind, the current study is designed to explore the implication of commercialization of smallholder dairy farming for the social and economic status of women dairy farmers. Based on the primary data collected from North Shewa zone through survey, focus group discussion and interviews, the study reveals that the mean income of dairying households has increased in the process of smallholder dairy commercialization; however, its implication for women's socio-economic status has been found negative. Women are increasingly disadvantaged in the process of dairy commercialization because of persistent gender-disparities in access to productive resources and the family structure in the study area. Moreover, women are the bearers of additional workload of dairy intensification and commercialization while men share the income, contrary to the income from traditional subsistence-oriented dairying, which was controlled and spent by women. There is a direct relationship between households' level of dairy technology adoption and women dairy workload. Access to and control over dairy resources and services has been dominated by men. The level of knowledge and skills of women in the dairy value chain was limited to production and their participation decreased as we move downstream, to lucrative stages with the level of commercialization. Reducing workload, ensuring access to and control over dairy income and resources and dairy skill development may improve the socio-economic position of women dairy farmers in the area.

1. Study Background and Statement of the Problem

The government has been implementing the Growth and Transformation Plan (GTP) since 2010 considering it as the major pathway from a semi-subsistence agrarian economy to a more diversified and food-secure economy. The plan indicates that the transformation of the agricultural sector, especially in terms of rapid agricultural diversification and commercialization, must be complemented by an effective marketing system (MOFED 2010). Smallholder commercialization is among the crucial features of the growth and transformation plan in Ethiopia. Liberalization of markets and the introduction of improved cross-breed cows with related technology are among the strategies encouraged by the current government to increase smallholder dairy farmers' market participation in order to enhance their income and improve food security. This strategy is also believed to support the GTP by offering high return to land and labour, empowering women and youth

and is suitable for adoption by smallholder farmers who continue to dominate the production system in the country.

Advocates of commercialization argue that agricultural commercialization is indispensable for economic growth for most developing countries relying on the agricultural sector. Shapiro et al. (1998), Steglich (1999), ILRI (2003) and Tangka et al. (1999) argue that commercial dairying increases production and sales of dairy products, especially liquid milk, resulting in greater market orientation and participation of farm households, which leads to increased household income, especially where demand and infrastructure are favorable. However, Endeley (2001) argue that development policy makers need to be critical in analyzing cultural contexts and questioning the likelihood that income generating policies and activities will change the gendered power relations because access to income is not necessarily linked with achieving control over it or the right to participate in social, economic or political decision making in the household or outside.

Dairy commercialization is based on the premise that it increases income at household level. Although women's need for income is unquestionable, the link between increased household income from commercial dairying and socio-economic status of women in Ethiopia is not yet clearly established. In the subsistence dairy farming in Ethiopia, dairying is a women's business; it is their responsibility to handle and market dairy products. They do the milking, process milk in to butter, cottage cheese and yogurt for both household consumption and for sale. This was an important source of income for rural women. With commercialization of the dairy sector, characterized by market liberalization, introduction of cross-breed cows and proliferation of dairy cooperatives, milk has been changed into a 'cash crop' product produced for sale rather than for consumption at household level. This process of shifting the product from food crop/product to cash crop/product may also affect the resource allocation decisions in the household beyond its income effect. The current study is, therefore, designed with the major aim of assessing the implication of dairy commercialization for the social and economic status of women dairy farmers. The study focuses on women's role in dairy farming and marketing, men's and women's access to and control over dairy income and other productive resources, women's knowledge and skills in dairy enterprises and its implication for their social and economic status in the household as well as in the wider society.

2. The Study Site and Research Methodology

2.1. The Study Site

The study was conducted in Oromia National Regional State, the largest of the nine regional states in Ethiopia, with 354 thousand sq km (one-third) of the total area of the country and 36 percent of the country's population (CSA 2008). The region is classified into 18 zones and 190 weredas (districts). The climate of the region is found to be favourable for different crop farming activities and animal rearing. The target of this study, North Shewa Zone (Selale), is one of the 18 zones in Oromia, known for its high potential for dairying. The zone accounts for 3.3 percent of the regional area and 6.1 percent of the regional population (CSA

2008). Women dairy farmers in Sululta wereda, a peri-urban wereda located about 35 km and Dagem weredas located 125 km northwest of Addis Ababa are the main target of the study.

2.2 Study Approach, Data Collection, Sampling and Analysis

The study is based on mixed methods approach, where both quantitative and qualitative techniques have been used in the form of triangulation and with the intention of backing numerical information with qualitative aspects. As the techniques are different having their own strength and weakness, the combination of these techniques is believed necessary to enrich the research by triangulating the findings of one method against the other; to benefit from the strengths of each method and to compensate for the weaknesses; and establish confidence and obtain trustworthiness of the research findings. Accordingly, a structured questionnaire was developed and distributed to 152 women dairy farmers to generate quantitative information between June - July 2011. Further, two focus group discussions (FGD), one in each wereda, with 10 members in Dagem, 12 in Sululta and five key-informant interviews were held to generate qualitative information. Half of the participants of the focus group discussion in both weredas were involved in the survey. The key informants were used as a means to gain a deeper insight into change in the farming situation and its effects on the status of women. Women and men dairy farmers, government officials working in agricultural offices, artificial insemination (AI) centre technicians and veterinarians and development agents were included in the interviews.

Purposive sampling techniques were employed to select participants of the survey, FGD and key informant interviews. The survey sample included 73 dairy farmers who own crossbreed cows with related technologies, and 79 owning indigenous breeds, to assess the impact of the difference between the two breeds, in terms of milk production, household income and workload. Hence, women in the households who had experience and successful careers in dairying, women dairy farmers who headed their households and widows who had dairy farming experience were identified with the assistance of veterinary technicians and development agents.

The quantitative information gathered has been tabulated to show the socio-economic background of respondents, market orientation of farmers, women's role in the dairy value chain and the extent of their workload, women's and men's access to and control over dairy income, resources and services, and their knowledge and skills in different stages of the dairy value chain. A comparison of households who own indigenous breeds with those who own crossbreed cows with relevant dairy technology were also done to assess the impact of the adoption of new technology on milk production, household income and workload. The qualitative information was used to verify and explain the quantitative data.

In the section that follows, a literature review is presented. Next, the data is presented, analyzed and discussed. The final section summarizes the major findings and concludes the study.

3. Literature Review

In this section, the relevant literature will be briefly reviewed and discussed in relation to the research questions. The major areas covered include women in dairy operations, women's access and control over dairy resources and the implication of dairy commercialization for intra-household gender relations and women's empowerment.

3.1. Women in Dairy Operations

According to Mutinda (2011) and EADD (2008), women have a longstanding traditional role in livestock production in East Africa. Although they participate in local milk production, collection, processing and marketing, women's participation in the formal dairying value chain is often low and passive as they tend to contribute much at the production level but miss out at the subsequent and more profitable levels such as accessing membership in farmer organizations (FAO 2010 and EADD 2009). This low membership locks them out of extension activities, training, information, leadership and decision making, access to marketing and financial services.

In addition to low participation, female farmers' preferences in market-led approaches differ substantially from their male counterparts' (FAO 2010). Value chain development that does not take into account these gender needs and preferences faces the risk of reinforcing, reproducing and/or maintaining gender inequalities, often propagated by prevailing socio-economic and institutional frameworks which determine who does what, who gets what and who makes which decision (Mutinda 2011).

Research by EADD (2009), Mutinda (2011) and FAO (2010) agrees that women are represented disproportionately in low value chains, and the lower value nodes within them and men tend to dominate functions with relatively high barriers to entry and correspondingly greater returns.

3.2. Women's Access to and Control over Income and Other Means of Dairy Production

The main goal of agricultural commercialization in Ethiopia is to increase farm households' income, meet demand for agricultural products and enhance food security. However, the income that is generated from agricultural production is not shared equally between husband and wife. A gender differentiated study on the income impact of dairy commercialization indicated that men and women in households with cross-breed cows had 14 and 4 times higher dairy incomes than men and women in households with indigenous breed cows in Ethiopia, respectively (Tangka et al. 1999). Thus, although both women and men benefit from market-oriented dairying, men's cash incomes rise significantly more as a result of dairy commercialization compared to those of women; it hence entailed increased income inequality between men and women.

Coles and Mitchell (2011), SNV (2010) and Tangka et al. (1999) recommended examining the impact of the introduction of market-oriented

policies on women's control over the income generated or that they traditionally controlled. The intra-household changes in income control with transition from traditional to market-orientation and its effects on women's role and responsibilities is thus, a critical area in gender and agricultural commercialization studies.

As reported by FAO (2010) women's secure access to or ownership of assets such as land and livestock increases their decision-making power within the household. They are often able to control the income gained from the sale of livestock products, and livestock assets can become bargaining tools for improved household relations. According to Overholt et al. (1985) and Cloud (1985), cited in Tangka et al. (1999), an important factor that enhances women's dairy productivity is the extent to which they have access to education and training. They have indicated a positive effect of education and training on agricultural productivity. Yet, women in developing countries in general, and in Ethiopia in particular, have no formal training, which becomes a bottleneck for the success of their enterprises. Lack of formal training affects women's competitiveness in the market and it is one of the reasons for their commodities' being taken over by men when it enters the market arena.

3.3. Intra-Household Gender Relations and Women's Position in Dairying

Research by FAO (2010) and Farnworth (2010) on intra-household dynamics has shown that it is not only the total amount of household assets that determines development outcomes, but most importantly, who in the household controls the assets. In patriarchal communities, men tend to claim ownership of much of the assets in a household.

FAO (2010) indicates that commercial dairying, besides worsening women's workload, is likely to erode women's traditional control over milk products especially in transitional pastoral areas, while Mullins et al. (1996) argue that women are better off in market-oriented dairying, due to income increases and stability although their work load increases. Without taking into account household gender relations, no intervention can lead to meaningful and sustainable empowerment (FAO 2010; EADD 2009). Bravo-Baumann (2000) indicates that economic factors are very crucial in determining change because with increased economic independence, there is a possibility for upward socio-economic mobility of women. The factors that determine what benefits accrue to household members through involvement in economic activities operate both within the household and within the value chain itself. At chain level, the highest returns are enjoyed by individuals who can access the most lucrative functions. Fundamentally, the control of income and expenditure at household level may enable men and women to benefit from economic activities in which they do not directly participate. Participation does not necessarily produce gains, and non-participation does not necessarily imply no gain because the gender power relations that determine who controls factors of production, outputs and income are governed by context-specific socio-cultural factors.

Longwe (1991) emphasizes that control over resources is the ultimate proof for women's economic, social and political empowerment as access alone cannot

empower women. Women's getting access to income primarily ensures the welfare of the family, and can hardly address problems of women's oppression and subordination. Endeley (2001) states that empowerment in connection with projects that focus only on ensuring women's access to moneymaking opportunities can only mislead because the true meaning of empowerment as transforming unequal gender power relations is forgotten and patriarchy is not challenged. Facilitating women's access to money is not an effective means for achieving women's empowerment unless it is linked to training for women on self-esteem, gender awareness for men and women, training on the impact of women's subordination on women, family and society and the meaning and benefits of empowering women (Endeley 2001; Longwe 1991). If women are permitted to earn money without retaining control over it or gaining status in their households or the community, men are the ultimate beneficiaries.

4. Data Presentation, Analysis and Discussion

This section deals with data presentation, analysis and discussion. There are five sections dealing with the socio-economic background of the respondents, market-orientation of smallholders, women's role in dairy enterprises, women's access to and control over dairy income and other means of dairy production, and the level of knowledge and skills of women in the dairy enterprises.

4.1. Socio-Economic Background of the Respondents

The description of the socio-economic background is mainly based on the survey information. It covers the demographic, social and economic status of the respondents in relation to family structure, household size, educational attainment, membership in farmers' organizations and main livelihood occupation.

Table 1. Socio-economic characteristics of respondents

Variables	Frequency	%
<i>Family structure of respondents:</i>		
Male headed	132	86.8
Female headed	14	9.3
Widowed	6	3.9
<i>Household size:</i>		
1—3	30	19.7
4—6	84	55.3
7—9	29	19.1
10—12	9	5.9

Variables	Frequency	%
<i>Educational attainment of the respondents:</i>		
Illiterate	70	46.1
Read and write (literacy campaign)	29	19.0
Primary education	34	22.4
Secondary education	19	12.5
<i>Membership in Farmers' Organization:</i>		
Member	7	4.6
Non-member	145	95.4
<i>Major occupation:</i>		
Farming	124	81.6
Trader/Merchant	13	9.9
Farm laborer	15	8.6

Women in male-headed households constitute 86.8 percent of the respondents while 9.3 percent are from households headed by females and the remaining 3.9 percent are widowed females. This indicates that most households in Selale area, as elsewhere in the country, are headed by males thus confirming the patriarchal family structure of the society.

The average household size in two areas slightly differ, with 5.7 in Dagem and 4.8 in Sululta. Most of the respondents (55.3%) have a household size ranging from 4-6 members, followed by 19.7 percent with 1-3 and 19.1 percent ranging from 7-9 and the remaining 5.9 percent 10-12 members. Commercial dairying demands labor and study households have 4 or more members that can supply the needed dairy labor.

The survey result depicts that 46.1 percent of the women are illiterate, 22.4 percent of the respondents have primary education, 19 percent attended literacy campaigns while the remaining 12.5 percent have secondary school education, implying that many do the dairy business through informally gained experiences.

Most respondents (95.4%) do not belong to any farmers' organization, 4.6 percent reported that they were members of the dairy cooperative and all were located far from the main road. In this sense the dairy cooperative was used as a means to access to the market for those who are relatively far from such infrastructure, thus confirming organizational membership as an opportunity to access dairy development services.

Farming is the main livelihood activity reported by the respondents (81.6%), followed by trade (9.9%). People who reported trade as their main livelihood activity also have small domestic dairy farms and the remaining 8.6 percent mentioned other activities as the main livelihood activity but have dairy farm as well.

4.2. Market Channel and Level of Dairy Commercialization in Selale

According to the information gained from the focus group discussion and interviews, selling milk was not common in Selale area in the past. Taking milk outside of the compound of the household is assumed to cause damage to the cattle farm (Kara). With increasing milk demand and introduction of new cattle breeds, selling milk and milk products has become the commonest livelihood of young people in the area. Marketing milk starts from the farm gate to neighbors. The local markets are active for milk products like butter and cottage cheese. The emerging cafeterias in small towns are also an important outlet for milk marketing in local areas. However, milk marketing in Selale is dominated by four categories of buyers: dairy cooperatives, private collectors (middlemen), processing companies and local cafeterias and neighbors. The private collectors, cooperatives and processing plants have milk collection centers (MCC) where the suppliers pool their products.

Table 2. Percent of raw milk supplied to different buyers

Milk buyers	Frequency	%
Private collector	98	64.5
Cooperatives	14	9.2
Processing companies	8	5.2
Neighbors	32	21.1
Total	152	100

Most respondents (64.5%) supply milk to the private collectors, 21.1 percent supply milk to neighbors and 9.2 percent supply to cooperatives. The remaining 5.2 percent of the respondents supply milk directly to processing companies.

The smallholder dairy farmers also process milk at household level for household consumption and sale in the form of butter (kibe) and cottage cheese (ayibe). Although the participants of this study supply raw milk to one of the four buyers identified above, most of them also reported that they are involved in milk processing at household level.

Table 3. Milk processing status of dairy farmers

Status	Frequency	%
Milk processors	99	65.1
Non-milk processors	53	34.9
Total	152	100

Most of the respondents (65.1%) reported that they process milk to add value at household level. The remaining 34.9 percent sell raw milk to the collectors, cooperatives and neighbours, and they add no value to it. The common types of milk processing or value addition in the area is in the form of making butter (76.8%), and cheese (13.1%) and a few households located closer to Addis Ababa have reported that they separate cream from milk (7.1%).

Processing milk or value addition to milk is not the priority for women farmers. They think of making butter and cheese when they find it difficult to sell the fresh milk due to market inefficiency, the fasting season and low milk quality. As such adding value to milk, according to the participants of the focus group discussion, is the coping mechanism of the market inefficiency and fasting practice in the area.

An attempt has also been made to assess the impact of the introduction of crossbred cows in the study area on the milk production, income and workload of the farm households and level of commercialization. The average milk production per cow, household level daily workload and average dairy income are summarized in the following table.

Table 4. Comparison of crossbred and indigenous cows in terms of income and workload

Type of cow owned	Average milk production per cow	Household daily workload	Average income per cow per day
Cross-bred	9.2 litre	7.6 hours	46.68 birr
Indigenous bred	4.8 litre	3.2 hours	25.92 birr

As assumed by many dairy development policies, the introduction of improved cattle breeds has an impact on household milk production and income. The average milk production from cross-bred cows is almost twice that of the indigenous breeds. The mean dairy income of households who own one cross-bred cow is also twice the income of households who own indigenous breeds. However, focus group discussion participants mentioned that the cost of production is also high for cross-bred cows, which was estimated to be twice that of the indigenous breeds. Household level workload is the other important area where the comparison is found to be significant. The introduction of cross-bred

cattle changed the cattle management from mainly grazing-based management to farm-feed production and cut and carry of feed (Felleke 1995). These types of activities need more labor in the household (on farm) compared to the indigenous breeds. On average, the management of the cross-bred cows needs 7.6 hours per day, while the same figure is 3.2 hours for indigenous breeds. The additional workload of the cross-bred cows has disproportionately gone to women. Households who own cross-bred cows have a higher level of market participation compared to owners of indigenous breeds. This is partially related to the perception in the area that milk from cross-breed cows has less fat and not recommended for consumption at household level.

4.3. Women’s Role in Dairy Farming and Marketing

As in most rural farming societies, women who participated in this study indicated that they undertake cooking, caring for children, fetching water and firewood, cleaning the homestead, clothes and barn, dung collection and dung cake preparation, cow milking and milk processing, preparing concentrates for milking cows and calves, and marketing dairy products. They also participate in crop production, weeding, harvesting, and transporting harvested crops to threshing fields. Weddings, child births, funerals, religious gatherings and festivities are social affairs in which woman have to participate and contribute labour. Women’s role in dairy production, processing and marketing stages of dairy value chain is presented as follows.

4.3.1. The Role of Women in the Production Stage

Women have a significant contribution in the agriculture sector in Ethiopia; however, their participation and contribution is confined to the production stage and their participation decreases as we move downstream in the value chain. According to Njuki et al. (2011), it is possible to see production stage activities at two levels: production-oriented activities and service-oriented activities. These activities could be performed either in the household or in the external environment as presented in tables 5 and 6.

Table 5. Percentage of participation in dairy production, by sex

<i>Activities</i>	<i>Women</i>	<i>Men</i>	<i>Both</i>
Activities undertaken in the household			
Barn cleaning	66.4	8.6	25
Cleaning dairy utensils	82.2	7.2	10.5
Feeding cattle	25.7	19.1	55.3
Feeding calves	46.7	19.1	34.2
Watering cattle	39.5	22.4	38.2

<i>Activities</i>	<i>Women</i>	<i>Men</i>	<i>Both</i>
Milking cows	80.2	10.5	9.2
Forage/Concentrate preparation	24.3	39.5	36.2
Collecting/making dung cake	94.5	2.2	3.3
Production activities taking outside of home			
Purchasing cattle feeds	14.4	71.7	13.9
Cutting grass	9.9	80.3	9.8
Taking animals for grazing	13.2	70.4	16.3

Women have got a large contribution in the production-oriented dairy activities that take place inside the household. As the survey results show, 94.5 percent of the dung collection/dung cake making, 82.2 percent of dairy utensil cleaning, 80.2 percent of milking and 66.4 percent of barn cleaning are activities covered by women in the study area. Women also carry out 46.7 percent of feeding calves, 39.5 percent of watering cattle, 25.1 percent of feeding cattle and 24.3 percent of forage preparation. Although not to the extent to which they perform production activities in the household, women also participate in production activities outside it. They do 22 percent of the purchase of cattle feed, 20 percent of tending to animal grazing and 15 percent of cutting grass.

Service-oriented activities are activities widely undertaken in dairying. Like production-oriented activities, service-oriented activities can also be categorized into those done in the household and those that take place outside the household.

Table 6. Percentage of participation in service-oriented dairy activities, by sex

Service-oriented activities	Women	Men	Both
<i>In the internal environment</i>			
Heat detection	30.9	68.4	0.7
Carrying out first aid	12.5	82.2	5.3
Carrying out vaccination	13.1	82.9	4
<i>In the external environment</i>			
Reporting to veterinary technicians	10.5	81.6	7.9
Reporting to artificial insemination technicians	11.1	86.8	2.1

Focus group discussion participants mentioned that no particular person is responsible for heat detection and checking the health conditions of the animals; however, after either heat or health problems have been observed, it is mostly the husband who calls veterinarians or takes the animals to the place where they have access to proper treatment.

As table 6 shows, 68.4 percent of the respondents mentioned that heat detection is the activity of males, while 30.9 percent said women are responsible for heat detection. First aid is considered as the responsibility of males by 82.2 percent of the respondents while 12.5 percent say women do first aid. Reporting to veterinarians and assisting in vaccinations was mentioned to be the responsibility of the male by 82.9 percent of the respondents while 13.1 percent of the respondents indicated females perform the activity. It was also indicated by 10.5 percent and 11.1 percent of the respondents that women do the reporting to the veterinary technician and artificial insemination centre, respectively. The other 81.6 percent and 86.1 percent of the respondents indicated that males do the reporting to veterinary technicians and artificial insemination centers, respectively.

In general, the involvement of women in dairy activities that take place outside of the household is low. This has implications for the social position of women and suggests that women's involvement in income generating activities or their access to money and even control over it does not necessarily lead to changing the social position of women in the society.

4.3.2. Women's Role in Dairy Processing and Marketing

Although women included in this study are those who supply raw milk to the private collectors, neighbors and cooperatives as indicated earlier, efforts have been made to assess women's role in processing dairy products in the home and in their locality. The study shows that most households do process milk in their household for both household consumption and sale. Processing milk in the household is the responsibility of women according to the focus group discussion participants.

Dairy marketing was the responsibility of women in traditional dairying. In this system, women process milk into butter and cheese and sell in the local market to generate income. In commercial dairying the participation of women in dairy marketing is influenced by different factors. The distance of the delivery centre from home, the type of milk buyers and the quantity of milk production has been found to influence women's participation in milk marketing. It has been mentioned by the focus group discussion participants that private collectors usually come nearer to the farm gate with their vehicles for households located on the main road and to the nearest collection centre for the others. Women can easily dispatch milk to such buyers after milking. For more formal buyers, particularly cooperatives and processing companies, the involvement of men has been reported to be high as it requires membership and arranged payment.

The quantity of milk marketed was also found to influence women's participation. If the quantity of milk produced and marketed is high, then men and other household members are likely to be involved; otherwise women do the marketing. However, most producers in the study area market their product at the

door step to private buyers and this is generally a small quantity of milk. This can give women an opportunity to be involved in milk marketing, where they can receive, control and spend dairy income.

Women's direct involvement in milk and milk product marketing give them an opportunity to involve in formal milk marketing. According to the FGD participants, women fail to be punctual to take milk to the collection centre, due to their high workload in the household and sometimes the collectors leave early, which poses risks to the milk quality and discourages women farmers from expanding their farms.

4.4. Women's Workload in Commercial Dairying

Specialized dairying changed the farm from grazing animals in the field to the stall-feed system, where preparation of concentrates, feeding and watering of animals in the backyard, heat detection and first aid increased women's labor burden. The workload is even heavy for households who have both indigenous and cross-breed cows due to the different management requirements of these two types of breeds.

Table 7. Average time utilization of selected dairy activity

Dairy activity	Average time spent on the activity per day (in minutes)	Frequency of the activity per day
Milking	45	2
Barn cleaning	60	1
Dung cake preparation	35	1
Watering animals	40	1
Cleaning dairy utensils	45	2
Milk processing	75	1
Feeding animals	30	2
Making concentrates	60	1

On average the activities mentioned in table 7 need 6.5 hours per day, irrespective of the number of cows that the household owns. Milking, cleaning the barn and dairy utensils, dung cake preparation and milk processing are the duties heavily dominated by women. Although it may differ depending on the number of milking cows, women spent on average 45 minutes to milk a cow per day in the study area. In specialized dairy farming, the woman alone may not be able to manage milking all the cows twice a day together with other household work and it is becoming common to have employed workers or the assistance of

relatives. Barn cleaning and preparation of concentrates take on average 1 hour per day, respectively.

The preparation and mixing of concentrates and feeding of the animals are normally done by the wives or by the other females in the family. Preparation of concentrates includes roasting grains, grinding and mixing, which take 1 hour per day on average, though it differs depending on the number of cattle.

Consistent with the finding of Mullins et al. (1996), women interviewed stated that household income has increased in market-oriented dairying; however, the workload that the cross-breed cow has introduced is significantly high when compared with traditional breeds. There is a direct relationship between households' level of dairy technology adoption and women's workload. Beyond the heavy workload that would be accomplished, women also sacrifice their involvement in other production activities like crop production, trade, community management and social affairs.

4.5. Women's Access to and Control over Dairy Income, Resources and Services

The gender relations that govern society at the higher level and family structure at the lower level govern women's access to and control over dairy resources and services. The demand for milk is predicted to increase significantly across the developing world in the coming two decades (World Bank 2008). Women's secure right over dairy resources like land, labour, livestock and other dairy technology and services is a prerequisite for dairy development and improved women's social and economic positions.

In this section the access and control profile of men and women on dairy income, resources and services has been discussed vis-à-vis its implications for their socio-economic positions. These resources are the *means of production* in the words of Karl Marx, and it is the primary determinant of the position of a person or group in a society. The major resources in dairy farming include land, livestock, labour, dairy training, dairy services (AI centers and veterinarians), and market information, farmers' organizations (cooperatives) and credit. The following table summarizes access to and control over major dairy resources and services.

Table 8. Access to and control over dairy income, resources and services, by sex

Dairy resources/services	Access profile			Control profile		
	Women	Men	Both	Women	Men	Both
Income	29.6	23.2	47.1	19.1	17.8	63.2
Cattle	8.9	43.2	47.9	5.3	13.2	81.5
Land	16.5	52	31.5	11.2	70.4	18.4
Labour	27.1	32.7	40.2	21.1	51.3	27.6

Dairy resources/services	Access profile			Control profile		
	Women	Men	Both	Women	Men	Both
Training	7.6	23.4	10.5	6.6	88.1	5.3
Services	12.3	38.2	14.2	9.9	64.5	25.7
Market information	14.3	57.1	28.6	13.2	57.9	28.9
Cooperative	13.4	9.2	7.2	12.5	62.8	24.7
Credit	5.1	15.1	5.9	4.6	78.9	16.4
Average	15	32.1	24.2	10.6	58.9	30.5

As indicated in table 8, about 29.6 percent of the women can access dairy income, while the proportion for women who control it is 19.1 percent. It is 23.2 percent and 17.8 percent for men, respectively. The majority of the respondents, 47.1 percent for access and 63.2 percent for control, emphasized the joint access and control of dairy income in the household. With the commercialization of dairy, women are increasingly disadvantaged because of persistent gender-disparities in access to productive resources and family structure. A study on dairy income control in traditional dairying in Ethiopia by Whalen (1983) indicated that women control 69 percent of the dairy income by processing and selling butter and cheese, which they also spend. In comparison to this early study, it seems women's control of dairy income is decreasing, while mean dairy income is increasing. But still women's control of dairy income is higher than men's, due to the small-scale production of milk, which is usually sold to neighbors or at the doorstep often by women. Studies (EADD 2009) showed that formalization of the milk market can erode the traditional female control of milk and its by-products, thereby decreasing their power within the household. With increased production of milk, the formalization of the milk market is demanded and men's involvement and control of milk income is inevitable and this leads to decreasing women's control over dairy income, which negatively affects their social and economic status.

The money obtained from selling dairy products is primarily used for home consumption and the need of money for family consumption is usually greater than the income generated by women. So in such conditions women may not always be in a position to cover all their expenses and the little money they generate from dairying may not change their status in society.

According to Njuki et al. (2011), livestock is an important asset for many rural households and an asset that women can relatively easily acquire and hold, either through inheritance, markets or collective action. As table 8 shows, most respondents (81.6%) replied that the cows belong to the family. The other 12.5 percent of the respondents said that the cows belong to the men, while only 5.3 percent mentioned that the cows belong to the women.

Land is one of the precious and determinant resources that the agricultural society can hold. Land determines the status of an individual in agricultural society. Women theoretically can access land in Ethiopia, and their names and pictures now appear on land certificates. However, the bargaining power of women in matters relating to access and the attitude of law enforcing people towards women makes the practical application of this right challenging. The scarcity of land especially in Sululta makes access to land difficult for both males and females. As indicated in table 8, 16.5 percent of women can access land while in contrast to 52 percent for men.

Commercial dairying, especially with cross-breed cows, demands intensive labour input as indicated earlier. The availability of skilled labour determines the success of dairy enterprises. The labour demand in the study area is satisfied by the family members except for a few hired labourers. Women discharge their responsibility in the production stage, but it is not uncommon for women to be supported by other female members of the family, particularly the daughters and hired labour.

As indicated in table 8, limited farmers have access to dairy services and the numbers are very much limited for women. On average, only 3.4 percent of the women dairy farmers can access dairy services, while the same figure is reported to be 25.4 percent for men dairy farmers. Only 0.7 percent of the respondents mentioned that women can access credit which is an important tool for dairy expansion and development. It is only by 2.1 percent of the respondents that women's access to dairy service providers like artificial insemination centre and veterinary technicians is mentioned. The status of these services has been mentioned as very poor in the area by focus group discussion participants. Interview participants from Sululta area indicated that they are forced to invite veterinary and artificial insemination (AI) technicians from Addis Ababa and Debre Zeit, for which they pay higher prices (50 birr per cow).

As survey participants are women, there may be a tendency to consider their own resources as family property; however, on average, a response on the access and control profile of dairy resources and services shows male dominance. The respondents mentioned that males access 32.1 percent of the dairy resources and services and control 58.9 percent of the major dairy resources and services. Women access 15 percent of the major dairy resources and control 10.6 percent of it.

4.6. Women's Skills and Knowledge in Dairy Enterprises

Skills development is key to improving productivity, employability and income-earning opportunities. Despite rural women's crucial role in agriculture and other rural activities, higher barriers in education and training limit their participation in more productive and remunerative work, and ability to perform managerial and leadership roles and participate fully in the development of their communities (FAO 2010). The ability to define goals and act up on them is determined by the level of knowledge and experience that an individual has on the matter. Thus, knowledge and experience of women in dairy enterprise determines their position in the sector. Women's knowledge and skills on dairying was assessed based on

their duration of stay in the sector and level of awareness on the process followed in each stage of the value chain.

Table 9. Women’s dairying experience, in years

Years of experience	Frequency	%
Less than 5 years	44	28.9
6—10	30	19.7
11-15	25	16.4
16-20	16	10.5
21-25	19	12.5
26 and above	18	11.8
Total	152	100

As indicated in table 9, 28.9 percent of the surveyed women had less than 5 years experience, 19.7 percent had 6 to 10 years, 16.4 percent had 11-15 years of experience while the remaining 10.5 percent, 12.5 percent and 11.8 percent had 16-20 years, 21-25 years, and 26 and above years of experience, respectively. The skills and knowledge of women in different stages of dairy value chain have been assessed and presented as follows.

4.6.1. Production Stage

The study depicted that women do the production-oriented activities compared to activities in the other stages of dairy value chain, as the extension of their domestic responsibilities. Women’s source of dairy knowledge and skills was assessed and identified to be typically from four sources: family, husband, neighbors and employment in others’ dairy farms.

Table 10. Source of women’s dairy knowledge and skills

Source of dairy knowledge & skills	Frequency	%
Family	89	58.6
Husband	30	19.7
Neighbors	3	2.1
Employment	30	19.7
Total	152	100

As table 10 shows, the family has been rated as the major source (58.6%) of dairy knowledge and skill for women, 19.7 percent indicated the husband to be the source of their knowledge while the other 19.7 percent mentioned employment in others' farms as the basis of their dairy knowledge. Only 2.1 percent mentioned their neighbour as the source of their knowledge and skills.

The above survey result reveals that women carry out the dairy activities mainly based on the knowledge acquired informally from the family and the neighbors. None of the women in the study area had reported exposure to projects and government bodies or even the development agent as the source of their dairy knowledge.

4.6.2. Processing Stage

Women's knowledge and skills at the processing stage are mainly related to keeping milk fresh and value addition to sell it in the form of other products like butter and cheese. To keep the milk fresh women, clean the dairy utensils and quickly deliver to collectors, but this is usually challenging due to the unpunctuality of milk collectors and fasting seasons. Therefore, most respondents choose adding value to milk as a solution for avoiding wastage and making milk production profitable. Women in the study area are involved in processing milk using their traditional knowledge and skills and sell the products locally. Though most of them are involved in milk processing locally, they lack the technical knowledge and skills to process it to products with marketable standards. Most of them admitted that they lack the expertise and technological tools to add value to milk. However, lack of awareness and exposure to the external market situation can also limit women's search for new avenues or innovative efforts for adding value to milk and to produce butter and cheese in large amounts and at the expected standard.

4.6.3. Marketing Stage

Although there is a general belief that women have better marketing skills than men in Ethiopia, women's professional dealings with the market were found to be very limited in both weredas. Their involvement in marketing milk is seen only at the level of dispatching the milk from the farm gate or selling cheese and butter in the local market. Adding value to milk is taken as a second option and in fact not for getting better profit, except for market inefficiency and milk quality issues which constrain farmers from selling raw milk.

Although women get the money for the milk sold, they are hardly aware of the market mechanism of fixing the milk price. They have the tendency to get satisfied or dissatisfied with the milk price that they get from the buyer by comparing it with the previous price they received rather than calculating the cost of production and the selling price. There is also no consciousness on the value of their labour input.

Women included in the survey reported their milk supply ranges from 4 to 40 liters per day. The respondents also mentioned the prices of a liter of milk to be 5.4 birr on average and the cost of production of a liter of milk to be 1.09 birr

excluding their labour, which gives a net income of 4.31 birr per liter. The price was found to be slightly higher for those households who supply milk to private collectors than those who supply to cooperatives (who actually pay dividends in the long run) and in Sululta than in Dagem.

5. Summary and Concluding Remarks

5.1. Summary

This study has been designed with the aim of assessing the implication of smallholder commercialization for the socio-economic status of women dairy farmers in North Shewa zone. The following are the major findings.

Consistent with many other previous studies, the current study shows that women are responsible for all the domestic activities like cooking, caring for children, fetching water and firewood, and cleaning; The dairy-related activities like dung collection and making dung cake, milking cows, processing milk, cattle feeding and marketing dairy products are additional domains for women which increased their domestic chore burden.

Although women have got immense contributions in the dairy sector, both in the traditional and commercial production system, the study shows that their contribution is limited to the production stage in commercial dairying as the extension of their domestic activities and their participation has decreased in the progression downstream to the lucrative value nodes.

Adding value to milk, in the form of making butter, cottage cheese and separating cream from milk, has been reported by the participants as a coping mechanism to contain market inefficiency and price fluctuations in fasting seasons and failure to meet the milk quality standards.

Milk and milk product marketing are the commonest type of livelihood for young people in Selale area, who either produce dairy products or collect from other smallholders and supply directly to consumers or processors. Milk is supplied to four groups of buyers; cooperatives, private collectors (middlemen), processing companies and the local milk market (neighbors and cafeterias). Women's involvement in milk marketing has been found to be high when milk is supplied to private collectors, neighbors and local cafeterias. With formalization of the milk market the involvement of men tends to increase, as formalization needs membership and arranged payment, which heads of the household (mostly men) do.

The shift from traditional to commercial dairying has increased both household income and household workload, and the additional workload in commercial dairying has disproportionately gone to women, as the cross-breed cows are kept in the backyard and increased the production-oriented activities and/or domestic chore of women.

Access to and control over dairy resources can determine the position of the dairy operators. Women's access to and control over the means of dairy production in the study area has been found to be low and this can directly affect their social and economic position in the dairy sector and wider society.

Although most respondents in this study reported dairy income is jointly controlled in the household; women's dairy income control is slightly greater than men's control. Men's share for dairy income is something that has been introduced with dairy commercialization and has implication for women's social and economic position in the household.

Women's dairying knowledge is another important tool to run the business and to benefit from the outcome. Participants of this study have reported dairy experience ranging from 1-35 years gained informally from the family, husband, employment in dairy farm and neighbors. None of the participants has reported formal dairy training, although the area has been exposed to dairy development projects for a long time. Women's knowledge of the dairy enterprise has been found to be better in the production stage, as the extension of their domestic activities and decreases in the progression to the lucrative value chain stage, marketing.

5.2 Concluding Remarks

Dairy commercialization has achieved its policy aim by increasing household income; however, it has also increased household workload which has disproportionately gone to the women in the study area.

Formalization of the milk market also involved shifting control of milk income from women to men and implying potential reduction of dairy income under the control of women. In this situation, women will increasingly depend on their husbands for even small expenses and dairy commercialization negatively affects their status in society rather than empowering them to have better positions in society. Therefore, the social dimensions of smallholder commercialization should be emphasized as much as the economic dimensions. This can also indicate that although many income generating activities assume women's empowerment as their objectives, they also tend to end up widening the income gap between men and women in the household.

The assumption of programs and policies that increased income at household level benefits all should be re-examined. Interventions needs to rely on gender analytical tools to identify the actual and potential roles of women and to develop strategies to benefit both men and women. As the current study shows, men are attracted to activities of women when they begin to generate money or higher prices and the deteriorating control of women over income from these commodities is often an unintended result of commercializing commodities that women used to control. In this case creating awareness on gender difference, gender sensitivity of commodities and skills building about the benefit of women's empowerment, women's control over income can ensure that women do not lose control of the income they at least traditionally managed as the products enter the market arena.

In general, engaging both men and women in commercial activities, using both formal and informal milk markets and creating awareness among the wider community about resource sharing and use can be key steps to be taken in facilitating gender equity in commercial progresses. In addition, reducing women's workload, ensuring women's secure access to resources and maintaining

their control over dairy income, skills training about dairying in particular can ease the negative effects of commercialization programs on women's social and economic status.

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