

Smallholder Dairy Production: Analysis of Development Constraints in the Dairy Value Chain of Southern-Ethiopia

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Abstract

This study analyses development constraints of the smallholder dairy production system in the Dale and Shebedino districts of southern Ethiopia. Data were collected from 120 dairy producers, six focus group discussions and six key informant interviews. Two major dairy production systems were identified based on major agricultural activities: the coffee-based dairy production system and the enset-coffee-based dairy production system. Coffee-based dairy producers owned less local dairy cows and earned a higher income as compared to farmers in enset-coffee-based dairy production systems, which generated relatively more income from off-farm activities. Shortage of feed and feed resources, lack of access to improved breeds, market and credit services were the major dairy development constraints in the two districts. Rapid urbanization, rising income, and population growth were creating market opportunities for dairy development in the area. Market was found to be the driving force of dairy development. In response to increasing demand for dairy products, most of the dairy producers were willing to expand their dairy farming. Sustainable dairy development can be achieved through improving access to key resources, inputs and services in the dairy production value chain and markets.

Key words: access to credit, dairy, inputs and services, off-farm activities

Induction

In Ethiopia, for the next one to two decades, rapid urbanization and population growth are expected. Changes are also expected in policy environment towards market economy. Creates a large opportunity for smallholder dairy producer and private investors (Mohamed et al, 2004). The large and diverse livestock genetic resources, existence of diverse agro-ecologies suitable for dairy production, increasing domestic demand for milk and milk products, indicate the potential and opportunities for dairy development in Ethiopia. Dairy sub-sector contribute 33% of the agricultural and 12% of total gross domestic product (Solomon et al., 2003). It has also played a vital role in the lives of the dairying farmers by providing a source of subsistence through household nutrition (milk and meat), supplementary income and generating employment opportunity (Tegegne and Gebrewold, 1998). Dairy development has been hampered by multi-faceted such as genotype, feed resources and feeding systems, access to services and inputs, low adoption of improved technologies and marketing. Various dairy research and development projects have been carried out. But, the impacts were unsatisfactory and failed to meet their objectives (Ahmed et al., 2003, Lobago et al., 2007) due to inability to identify appropriate technologies, define, the dairy production practices and constraints (Ayenew et al., 2009). Appropriate information and proper documentation of dairy production systems will play a vital role to develop the dairy sector (Rey et al., 1993). Though, very little systematic research has been conducted on dairy development constraints along the dairy

value chain. Therefore, it is necessary to identify major dairy development constraints along the value chain to improve dairy production and marketing system in the study area.

Methodology

Primary data were collected from a total of 120 farmers in two districts of Ethiopia (Dale and Shebedino). Multi-stage sampling procedure was followed to select six PA's from both district in both districts based on dairy production potential, distance from the market (Dale district is closer to the market than Shebedino) and road access. Accordingly, 120 households were selected using a systematic random and stratified into three wealth classes based on dairy cow holding (having 1cow = low, 2 cow = medium and 3 cow = high wealth class). A structured survey was conducted to collect the relevant information for socio-economic characteristics, dairy production system, opportunities and constraints. In addition to the main survey work, a total six key informant interview and six focus group discussions were conducted. This provided additional information to characterize the dairy production systems in the area. Descriptive statistical tools (mean standard error) chi-square tests and one-way ANOVA were used to analyze quantitative data.

Results

Sources of livelihoods and the role of dairy cattle

Agricultural activities were the main sources of livelihood for smallholder farmers in the study areas. However, relative importance of different livelihoods income sources were significantly different between the two districts ($p < 0.05$). In Dale and Shebedino districts 79 % and 99 % of the respondents were engaged in agricultural activities, respectively. In Dale district 21% of the respondents were engaged in an off-farm activity, and only 1% respondents in Shebedino district. The major purpose of keeping cattle was “milk and manure” in both districts. In Dale the banking function had additional importance and in Shebedino meat production.

Table 1. Income source and purpose of dairy animals in the study districts and wealth class of dairy producers in the study areas (percentage of respondent)

Variables	Districts		P-Value	Wealth class			P-Value
	Dale	Shebedino		Low	Medium	High	
Income source							
Agriculture	79.1	98.7		92	92.7	86.7	
Trader	0	1.3		0.0	1.8	0.0	
Employment	11.6	0.0	0.0	6.0	3.6	0.0	0.23
Agriculture & trader	7	0.0		2.0	1.8	6.7	
Agriculture & employ	2.3	0.0		0.0	0.0	6.7	
Purpose of keeping dairy cattle							
Milk and manure	54.8	55.8		58.0	56.4	42.9	
Milk, meat and manure	7.1	37.7		24.0	29.1	28.6	
Milk, manure and banking	33.3	1.3		8.0.0	12.7	28.6	
Milk	2.4	1.3	0.0	4.0	0.0	0.0	0.67
Meat	0.0	1.3		2.0	0.0	0.0	
Milk and meat	0.9	1.3		2.0	0.0	0.0	
Banking/insurance	0.0	1.3		2.0	0.0	0.0	

Chi-square P-values

Development constraints and opportunities

Feed and feed resources shortage, access to improved breeds, market and credit services were major development constraints identified by the respondents in the study areas.

Table 2. Major dairy development constraints by district and wealth class (percentage of respondents)

Major dairy development constraints	Districts		P-value	Wealth class			P-value
	Dale	Shebedino		Low	Medium	High	
Feed shortage	29.5	43.9		35.3	39.1	38.2	
Improved forage/pasture seed	14.3	0.7		5.9	6.1	11.8	
Improved dairy cow	0.9	0.0		1.0	0.0	0.0	
Market	10.7	20.9	0.03	18.6	14.8	14.7	0.69
Capital/credit service	17.0	17.3		18.6	17.4	11.8	
Artificial insemination Service	17.0	7.9		9.8	13.9	11.8	
Veterinary Service	5.4	7.2		6.9	6.1	5.9	
Training and consultancy	4.5	2.2		3.9	2.6	2.9	

Chi-square P-values

Dale district had more access to inputs and services than Shebedino district, significantly different between the two districts ($P < 0.05$). Moreover, in Dale district 14% of the respondents perceived improved forage/pasture seed as the second most important constraint next to feed shortage. Market access was the second most important constraint next to feed shortages in Shebedino district (Table 2). Accessibility dairy related services like AI, veterinary, credit, training and consultancy were significantly different ($P < 0.05$) between the wordeas. About 40 % and 32 % of the respondent in Dale and Shebedino district had limited access of dairy related services. However, accessibility of dairy related services was not affected by wealth class and not significantly different ($P > 0.05$) (Table 2).

Outcomes of focus group discussions as well as key informant interviews suggested that farmers were willing to improve and expand their farm if access to technology could be improved. However, there were still some dairy producers who were not willing to improve their farming practices due to various reasons. Particularly, producers in Shebedino district were less willing to improve than farmers in Dale district. The study showed that, between the two districts source of livelihood income was significantly different ($P > 0.05$) (Table 2). According to response from key informant interview, old farmers relied more on their years of farming knowledge and experience, and seemed to have difficulties in adopting new technologies. On the other hand farmers pointed out that, demand for dairy products in the areas was rapidly increasing due to population growth.

Discussion

Based on the type of crop farming activities, two types of major dairy production system were identified: *enset*-coffee and coffee based livestock production systems in Shebedino and Dale districts respectively. This study in line with Tolera and Said (1992), Tesfaye *et al.* (2001) and Zewdu *et al.* (2003). Dairy farming plays a vital role in the coffee-*enset* based livestock production system by providing organic fertilizer for *enset* crop production. However, in the coffee based livestock production system the dairy cows were used as a source of the livelihood income by selling of milk and manure. This finding agrees with reports of (Chewaka 2006). Likewise, the main source of livelihood income compared to income generated through livestock husbandry. Source of income can potentially impact on dairy improvement efforts. Agriculture and off-farm activities were the main source of income in Dale district while, in Shebedino district a majority of the respondents did not have any other option to get an income other than selling cash crops. This due to distance from the urban area and infrastructure. Hence Dale district has good road infrastructure and near to the urban area

than Shebedino.

The current study showed that, access to input supply and service provision is significantly different between the dairy production systems. Accessibility of input and services would have great impact on the dairy sector development. This finding is in line with Tegegne et al. (2006) who found better access of input and service would have a positive impact on the dairy development program. Availability of dairy-related inputs and services were higher in coffee-based dairy production than *enset*-coffee based dairy production. This could be due to income source difference of the farmers (i.e. those households based on coffee livelihood earn much more income than in *enset*-coffee based crop livelihood) and experience in using dairy related input and services (in the former régime, Shebedino district under the administration of Dale district as a result different dairy development project they were give high emphases for Dale than Shebedino district so that the farmers had better understanding and experience in using of dairy related input and service). As stated in Tegegne *et al.* (2006), such better access to input supply would have a significant contribution in dairy development.

Along with input constraints discussed in the previous sections, shortage of feed was a bottleneck in Shebedino than Dale district in the dairy development. This could be the apparent difference in the primary feed source between the two dairy production systems. Hence, in the coffee based dairy production system the primary feed source was crop residue and those farmers had no extra land to allocate for grazing, while natural pasture/grazing remains the main feed source in Shebedino district. However, very few dairy producers had limited access to improved forage/pasture seed and dairy animal were observed in Shebedino than Dale district. In other words, higher percentages of farmers in Dale districts relied on improving forage seed input, which were demanded more frequently by Dale district dairy producers than those in the Shebedino district.

Evidence from the key informant interviews and personal observation in the study areas, the existing marketing structure involved different marketing agents/stakeholders such as dairy producers, farmer, trader, processors, cafeterias and restaurants as well as retailers that buy milk and resale. Tegegne et al. (2010) indicate that, marketing and access to market were the major common problems in both districts. As highlighted in the discussion with the key informants, the main reasons for weak market access includes lowly integrated and collaborated among stakeholders, distance of the markets, seasonal milk production, price fluctuation, lack of training and consultancy on how to handle and process milk and milk products. These results are in agreement with report of Tegegne *et al.* (2010).

As noted in reports of Tegegne, Gebremedhin *et al.* (2006), most of the dairy producers had limited information on availability and importance of credit services for dairy-related activities like crop agriculture. Only few dairy producers in Dale district had access to credit service. Associated with this, about 93% of dairy producer used veterinary services, and the demand for service was significantly higher in Shebedino than Dale districts. This difference could be due to the fact that, dairy producers in Dale district keep improving breeds and also used different feeding management that limits exposure to diseases and parasite so dairy animal health management is far better than Shebedino districts. However, according to the key informant interview in both districts, there is a serious shortage of veterinary experts and limited access to veterinary drug.

In this study, due to income source difference, market opportunities and objective of dairying coffee-based dairy farmers were willing to continue and improved production system than *enset*-coffee based dairy farmers. Dale district, compared with Shebedino showed a rapid urbanization. As a result, good quality and quantity of dairy products were increasing in demand. In order to improve dairy production in these districts, livestock departments from both district agriculture offices implemented synchronization program. This provides

opportunity for smallholder producers to shorten the calving interval and improved dairy production. This well provides opportunity for smallholder farmers to use land, labour and feed resources efficiently and effectively to generate good livelihood income.

Conclusion and recommendation

The current study demonstrated that the majority of dairy producers in Dale district specialized and developed dairy production, and dairy farming became the second most important source of family income. Development of coffee-based dairy production involved more frequent use of modern dairy technologies with inputs leading to higher efficiency and a better product performance. Accessibility of farm resources, input supply, and service provision are major constraints to dairy development in these areas. Hence, implementation of synchronization programs as well as rapid population growth and urbanization of the regional capital, Awassa, and also Yirgalem and Dilla may provide huge opportunity for development of dairy farming in the region.

Dairy production in the studied areas can be improved by organizing farmers into small and medium commercial dairy enterprises. Moreover, smallholder dairy producers need crucial institutional support (GOs and NGOs) to promote efficient input and service provisions to improve their dairy production system. This includes creating better access to dairy related technology, particularly, feed supply, marketing systems, veterinary and AI service, credit, extension and training. Another element of the production chain that deserves special attention is sustainable collaboration and integration of different value chain actors/stakeholders. Achievement of dairy development goal could be initiated from this.

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