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Milk Market Performances and Cofounding Factors along Milk Value Chain in Pastoral Area: A Case of Borana Pastoralists, Borana Zone, Ethiopia

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ABSTRACT

The study was conducted in Borana zone with the objectives understanding the milk market performance and challenges along the value chain. The primary data was collected from 123 households that drawn proportionally following multistage sampling based randomly selected households. Additionally, relevant information was collected from different sectors besides relevant literature session. Similarly, Focused Group Discussions, key informant interview and visual observations were also undertaken to collect the primary data. In the course of data collection, different set of checklists were used for different groups of actors to guide survey data collection, group discussions and key informant interview. The study found that input supply, natural calamity, marketing system, declining of livestock productivity, infrastructure and hygiene are among the major challenges along the dairy value chain. Above all, the dominance of value chain actors by pastoralists coupled with fragmented milk marketing system was the critical factors that stunted the milk market system in the study area. As a result, the performance of milk value chain is fragmented and distorted. Moreover, the supply of milk to the market become meager even though the milk selling practices have been flamed. Additionally, the dilution of pure drought resistant Borana cattle called "Qorti" is at its critical level of its extinction which challenges the milk production. Thus, it is important to enhance the milk marketing, encouraging milk supply and improving milk productivity.

1. Introduction

In the economy of the country, livestock sector contributes about 7.1% of national GDP and about 19.48% of value added in agricultural sector^[1]. According to the estimates made by the CSA, Borana pastoralists contributes about 2%, 2%, 3% 4% of Cattle, Sheep, Goats and Camels of the county^[2].

In the milk production of the country, agro/pastoral area contributes about 98% of the milk production of the country coupled with *traditional highland mixed farming*^[3]. From this, Boran zone has been contributed about 2% of milk produced in the country. The urbanization and rapid economic growth in Africa and many developing countries have shifted food demand away from traditional staples toward higher-value foods like meat and milk^[4].

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However, informal trade, poor market, government restrictions, financial advantages to informality, non-financial advantages to informality have been tempting the performance of milk value chain ^[4].

On the other hand, limited past studies addressed challenges of dairy value chain consistently when the pastoralism is in concern. Likewise, both the productivity and price variability are higher in pastoral areas due to unpredictable rains and other natural hazards. Thus, it is important to understand the milk market performance and challenges along the value chain. Therefore, this particular article was focused on the current challenges along the milk value chain and its performances.

2. Methodology

The study was conducted in Borana zone, which found in the southern part of Oromia regional state at the border of Ethio-Kenya. The economic basis of the community is based on livestock production though most part of the area practices farming besides pastoralism livelihood system. The study used both secondary and primary information where the secondary information was collected from different sectors of Pastoral Development Office (PDO). Moreover, producers' survey, Focused Group Discussions (FGD), key informant interview and visual observations were also undertaken to collect primary data. In the course of data collection, different sets of questionnaires were used for different groups of actors to guide group discussions and key informant's interviews.

In drawing 123 respondents, households were drawn from randomly selected kebeles that were randomly selected from randomly selected districts in the zone. Additionally, the study addressed 20 traders and 2 other marketing actors for triangulation of information. Finally, descriptive statistics were estimated using SPSS software (Version 23) whereas the qualitative data were analysed using content analysis under the main themes beside descriptive parameters.

3. Results and Discussion

3.1 Socio-economics Characteristics

Labor is an import resource for individual households that can be a blessing or swear based on family management. In the study area, the household has about seven average family size with an one-to-one (3:4) ratio of male to female proportion where about 99% of the respondents have at least two children. The study addressed that the respondents were between 18-76 years old with the mean of 42 years (Table 1) where about 90% were aged less than

60 years old that clarify that they have ample experience and knowledge about the matter of study. Similarly, the sample households constitute about 87% of male-headed households, where only 33.3% were able read and write.

Table 1. Age and family size

Variable	N	Mean	SD	Min	Max	
Age	121	46.43	13.75	18	76	
Male	123	3.75	1.98	1	14	
Family size	Female	122	3.38	1.87	1	10
Total	122	7.20	3.30	2	20	
Education status	Male	Female	Total	χ^2		
Literate	58	26	84	0.04		
Illiterate	22	9	21			

Source: Own survey, 2016

3.2 Challenges along Milk Value Chain

In pastoral area, milk value chain is characterized by multifaceted challenges though opportunities are at the door. The traditional dominancy of milk marketing system adds a numerous burden to the milk value chain as labelled below along the chain.

Input Supply

Input is a key determinant of output owned to the quality, quantity and its types though optimal application is another question. Particularly, availability of the best breed, feed and water is very important to improve the production of milk. However, in the study area though the local breed, principally *Qorti*, is the best breed for both milk and meat production, it has been blamed of dilution with other low yield breeds. The study revealed that the milk yield is currently about 1.1, 2.3 and 0.33 Liter per cow, camel and goat per day respectively on average.

Similarly, other inputs such as veterinary drug and extension services are limited and owned to pastoral indigenous experience.

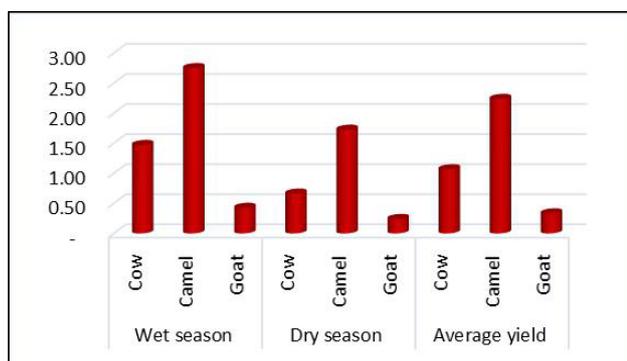


Figure 1. Average milk yield per day per cow

Natural Calamity

Though water and feed resources are key important natural resources, drought is the critical factors that pe-

riodically culling the livestock population particularly female animal. As a result, the milk production remaining low and inconsistent. Moreover, other studies also proved that variable weather conditions, erratic rainfall patterns with long dry spells, and high maximum temperatures are the greatest climatic threat to dairy value chain ^[5].

Declining of Livestock Productivity

Climate change that exacerbates the decline in the rangeland productivity has resulted in the deterioration of pastoral economy due to the decline in the livestock productivity coupled with genetic dilution contributed to the decline in the milk productivity, particularly cattle which is the dominant milk source. In responses to a declining in livestock production, the pastoralists have been diversifying into non-pastoral farming practices. The result from

Table 2. Challenges and opportunities along milk value chain

Process	Activities	Constraints	Opportunities
Input supply			
Capital, cow, feed, land, water, drug and labor	Feed supply Water supply Drug supply Capital supply	Shortage of feed Genetic dilution of local breed Poor access to vet. Drug	The practice of feed conservation The use of commercial feed Availability of crop residues Availability of vet post
Production			
	Feeding, watering, breeding, milking, health care	Low milk yield Poor milk management Drought	Expansion of community ranch for breed improvement The local existence of research on DVC
Milk collection			
Place, Material, Storage, fridge, transport	Transportation Storing Collecting Distribution	Poor rural road Poor cooling facility Poor transportation No quality test	Expansion of rural road On market Existence of milk cooling equipment IK of milk conservation
Retailing			
	Milk retailing Distribution	Lack of market linkage Seasonal variability Milk dilution	Existences of informal linkage Expansion of community ranch IK of milk limpidness testing skill
Milk processing			
	Milk collection Milk treatment Milk processing Selling	Lack equipment Poor milk quality Shortage of milk Low skill	Introduced processing equipment Availability of credit Milk processing practices
Consumption			
	Buying milk Feedback	Adulteration of milk Low quality of milk Fragmented supply	Expansion of milk marketing Awareness on milk selling IK of milk hygiene management

Source: Own survey (2017/18)

field survey proves that about 56% of the sample households are agro-pastoralists followed by pastoralism.

Marketing System

Unlike earlier experience, the practices of milk marketing become expanding in Borana zone as a daily cash source. However, the supply of milk is characterized by fragmented and disordered marketing system from its supply to consumption. The dairy market system was poorly organized where larger market actors are dominantly unregistered and informal traders which directed by their own motivations.

However, the situation detects that there is an informal agreement among the milk traders which seems a collusion form of monopsony to delimit the price gained by producers. Owned to dominancy of pastoral role in the value chain function, the informal traders are exploiting the consumers to the level of doubling price unreasonably.

Infrastructure

Infrastructure is another key determinant where the distance to infrastructure limits the access to basic need of a society [6]. From the survey result, about 50% of the respondent households travel 6-20 km per day to arrive at the nearby market for selling milk, which can take about

1-4 hours on foot travelling. Larger producers transported on foot, about 1.5-8 hours to sell milk, which have a clear implication on milk quality and quantity.

Table 3. Distance from major infrastructure

Distance from	N	Mean	Min	Max
Milk market	122	8.67	0.001	40
Town	123	6.96	0.04	20
Veterinary post	123	6.07	0.01	25
Water source	4	5.62	1	10

Milk Market Performances

In the market performance computation, the cost is based on the accounting cost owned to budget limitation, security issues, time and climate risks. In this stud, both Camel milk and cow milk was considered due to the dominant types of milk in the study area though milk from goat is also common for home consumption. From the analysis, on average the total gross margin is 50% for cow

Table 4. Cow milk marginal Analysis

Variables	Cow milk				Camel milk			
	Producers	Wholesaler	Retailers	Distributer	Producer	Wholesaler	Retailers	Distributer
MM	50%	10%	20%	20%	43%	14%	14%	14%
SP	15	18	24	30	12	15	18	21
BP	0	15	18	24	0	12	15	18
FCP	30	30	30	30	21	21	21	21
MC	0.88	0.42	-	-	0.82	0.42	-	-
GM _p	50%				57%			
TGMM	50%				43%			
GMM _p	-1%				-2%			

milk and 43% for camel milk. Though camel milk is highly distributed than cow milk in terms of volume, cow milk has higher preference in all areas.

As a result, the marginal gain from cow milk distribution (marketing) is higher than camel milk. From the analysis, though larger share received by producers, other actors have higher net marginal benefit due to their relatively low marketing cost. Generally, producers are the major loser from the dairy marketing analysis regardless of existences of dairy marketing are very critical.

4. Conclusions and Recommendation

The milk production remains very low though the maintenance of dairy animal needs integrated interventions to enhance milk supply. Moreover, sustainable milk supply is a critical challenge for poorly organized dairy cooperatives owned to fragmented milk marketing system. This discouraged the milk production due to the dominance of value chain by unlicensed traders, poor marketing center and lack of improved milk management facility. Thus,

- Licensing of youth-based dairy or milk cooperative business and encouraging rural milk supplying members;
- Enhances modern milk processing, preservation, and redistribution scheme;
- Enhancing dairy cooperative based network in the rural area.

The effort to enhance the milk productivity is very low due to the migration of dairy animal to the remote area for searching feed and water particularly during dry season. However, integrated watershed-based feed development needs further interventions beyond the current government supported ad hoc watershed practices. On the other hand, land degradation and bush encroachment have been the critical challenges in the study area. Thus, integrated rangeland restoration with,

- encompasses carrying capacity development;
- enhancing rangeland productivity and;
- improved rangeland management could enhance the suitability of milk supply.

Dairy potential was not aligned with the formal employment opportunities. Formally, organized graduated youth based dairy business in the form of cooperatives, unions and IMX is important to suggest by this study

though a critical analysis of the past challenges in dairy cooperatives remains a hot issue to be addressed.

On the other hand, the financial management of the informal cooperatives is characterized by infant operating system though the customary based honesty was richly developed in pastoral area. However, lack of business and financial management skill development needs critical and urgent interventions particularly for those infancy organized cooperatives. Thus, linking the formally organized traders with existing financial market adds the flavors to the dairy value chain performance.

Finally, the efforts related to restoration of original Boran cattle, which is naturally a drought resistant with fair milk production, are an encouraging scheme in pastoral area. However, it also important to evaluate simultaneous community based and other methods of breed restoration to improve the milk productivity of current Boran cattle need.

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