Market Chain Integration and Livelihood Performance among Dairy Cooperative Members in Debre Birhan, Ethiopia



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By

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Addis Ababa, Ethiopia

Declaration

I, Beza Tadesse, declare that this MBA thesis entitled "Market Chain Integration and Livelihood Performances among Dairy Cooperative Members in Debre Birhan, Ethiopia" is my own original work. The study is based on my independent research, and all sources of information have been properly acknowledged. This thesis has not been submitted to any other university for the award of any degree.

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This thesis has been submitted for examination with my approval as a university advisor.

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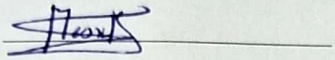
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Abstract

This study examines the factors influencing the livelihood performance of dairy cooperative members in Debre Birhan, Ethiopia. A mixed-methods research design was employed, combining quantitative and qualitative approaches. Quantitative data were collected from 210 smallholder farmers using structured questionnaires, while qualitative data were obtained through interviews and focus group discussions. Multiple linear regression analysis revealed that the model explained 67.3% of the variation in livelihood performance. The findings showed that value chain coordination ($\beta = 0.714$, $p < 0.001$) and input supply ($\beta = 0.419$, $p < 0.001$) had a statistically significant positive effect on livelihood performance. Qualitative findings supported these results, indicating that the merger of nine primary cooperatives strengthened bargaining power and improved price stability. In contrast, financial access showed a statistically significant negative effect ($\beta = -0.356$, $p < 0.001$), largely due to the absence of animal insurance and the high mortality of exotic breeds, which exposed farmers to financial risks. Physical infrastructure and milk quality were not statistically significant predictors. The study concludes that cooperative integration enhances livelihood performance, but financial services must be restructured to incorporate effective risk mitigation mechanisms.

Keywords: *Dairy Value Chain, Cooperative Merger, Livelihood Performance, Value Chain Coordination*

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Acronyms and abbreviations

AGE	Age of Household Head
AI	Artificial Insemination
ANOVA	Analysis of Variance
ATA	Agricultural Transformation Agency
CLRM	Classical Linear Regression Model
CSA	Central Statistical Agency
D/Birhan	Debre Birhan
DFID	Department for International Development
DT	Distribution and Transportation
ETB	Ethiopian Birr
FA	Financial Access
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GoE	Government of Ethiopia
HOP	Household Performance
HP	Household Performance
IMF	International Monetary Fund
IS	Input Supply
MI	Market Information
MoA	Ministry of Agriculture
MQ	Milk Quality
NGO	Non-Governmental Organization
OLS	Ordinary Least Squares
PI	Physical Infrastructure
SACCO	Savings and Credit Cooperative Organization
SLF	Sustainable Livelihoods Framework
SPSS	Statistical Package for the Social Sciences
UNDP	United Nations Development Programme

USAID	United States Agency for International Development
VCC	Value Chain Coordination
VIF	Variance Inflation Factor

Chapter one

Introduction

1.1 Background of study

Even though Ethiopian government is working to diversify its economy to service and industry, agriculture still has a higher role for national economy. According to the IMF world economy report Ethiopia's gross domestic product (GDP) in 2024 was 8.1% (IMF,2025), agriculture 32%, industry28%, and services 40% (UNDP, 2025).

The agricultural sector has crops and livestock. From the overall agriculture economy crops contribute approximately 65%, while livestock contribute only 35%. Overall, the Livestock sector contributes approximately 12% of the national GDP. (International Trade Administration, 2024).

The dairy sector falls under the category of livestock production. According to the Ethiopian Ministry of Agriculture, Ethiopia's cattle population is approximately 66.26 million to 70.3 million, making it the highest in Africa, of this total, about 12 million are dairy cows (Goshme & Dadi, 2024). Also, a 2024 report by the World Bank indicates that Ethiopia is the leading African nation in livestock numbers, with 70.3 million cattle (World Bank, 2024).Even though this great potential, the dairy sector’s contribution to national GDP remains low, due to productivity inefficiencies, weak market links, and limited value addition (Molla et al., 2023), lead the need for further research and investigation in this area.

Development of the dairy sector in Ethiopia can contribute significantly to poverty improvement and nutrition in the country. (FAO,2019) estimates that about 51 percent of the population of Ethiopia is underfed and over two million people are considered to be chronically food insecure. Compared to other countries in Africa, Ethiopians consume less dairy products. Per capita consumption of milk in Ethiopia is as low as 17 kg per head while the average figure for Africa is 26 kg per head. Besides providing income-earning opportunities for the poor, dairy development, especially at the smallholder sector level, can improve the nutritional status of Ethiopian children by making available milk for consumption and increasing household income (Molla, A. 2024).

Agricultural cooperatives were established and managed by government (Tefera, 2008). The Government of Ethiopia (GoE) believes that cooperatives in Ethiopia can contribute a significant role in transforming the rural economy. In addition to that, the GoE support cooperative sector, by excluding tax, provides land and policy support (Molla et al., 2023).

Dairy cooperatives are the primary actors in collecting milk from individual small holder farmers, who produce milk in traditional ways. (Chagwiza et al., 2016). This cooperative collect milk in milk collection centers. They check the quality of milk and facilitate access to larger and sustainable markets. In addition to milk collection and linkage with market the cooperatives provide different services such as training, veterinary assistance, and feed supply. They also perform as a platform connecting individuals with development partners, government programs, and financial institutions (Tefera, 2008).

Debre Birhan is one of the most attractive urban centers in Ethiopia, located within the subtropical highland area. Debre Birhan is highly suitable for hybrid dairy breeds, which typically work better in cooler environments. The climate is characterized by the high altitude bringing cool temperatures. Debre Berhan city is located at about 2750 meter above sea level. The annual average temperature of the city ranges between 4°C in the coldest month (August) to 26 °C in the hottest month (April). In addition to its climate advantage, the city is near to the capital city of Addis Ababaabout130 kilometers (SymbioCity et al., 2020). Allowing it to access urban dairy markets, cold chain infrastructure, and consumer demand.

This combination of environmental suitability and market opportunity makes D/Birhan the perfect place for studying dairy cooperatives, specifically in the context of improving market integration and value chain performance.

1.2 Statement of the problem

Dairy sector in Ethiopia creates job opportunities and increases nutritional income (Kuma et al., 2022). In Ethiopia livestock has a higher number when it is compared with Africa. It shows good potential for dairy development and economic empowerment of smallholder farmers. With this big capability, the sector still faces constant structural, institutional, and operational challenges. It affects market integration, and overall household income.

Good market integration is important for dairy cooperatives. It improves income and makes a better livelihood for members. However, many smallholders' dairy cooperatives continue to face

challenges. There is poor market access, the price is unstable, and weak governance (Tefera, 2008).

There are different studies in different regions of Ethiopia that shows the causes of these challenges. For example, in Wolaita there is small access to quality animal feed and veterinary services, this problems decrease milk production and income for smallholder farmers (Mengistu et al., 2022). In Sebeta, there are few milk collection centers, no cold chain systems, and poor road infrastructure. Those problems delay timely market participation, and it leads to high post-harvest losses (Desalegn & Eweg, 2018). In Harar, no access to credit and financial services unable farmers from investing in improved breeds and animal feed. It decrease productivity and market attractiveness (Tarekegn & Shitaye, 2022). In Dire Dawa, weak cooperative management and low technical support decrease farmers' participation. It weakens their bargaining power and income (Chagwiza, et al., 2016). In West Hararghe, there are shortage of animal feed and productivity of cattle also affects milk supply and household income (Kuma et al., 2022). Finally, in Southwestern Ethiopia, poor cooperative governance and members do not trust in cooperative. It makes members unable to participate and it became challenges for dairy cooperatives (Belay, 2020).

Market integration can increase household income by connecting dairy farmers to the markets. It facilitates when there is any change in price and reduces post-harvest losses (Kuma, et al., 2022). However, the degree of market integration differs across regions and cooperatives, with some urban milk sheds, such as Debre Birhan. In some region they have well access to formal markets and higher prices, while others rely on informal channels with unstable pricing, limiting potential livelihood improvements (FAO, 2019).

Good transportation, timely market information and good value chain coordination will help the farmers to get a competitive price. Lack of access to these factors prevent farmers from selling their milk competitively, resulting in lower income (Chagwiza, et al., 2016). Long distances to markets, lack of cold chains, and no storage facilities contribute to post-harvest losses. It also lead to fail milk quality standards and decreases farmers' income. While cooperatives are intended to address such gaps by promoting collective marketing, increasing bargaining power, and facilitating access to inputs. Their effectiveness remains unreliable. Studies in North-Western Ethiopia and West Shoa shows that cooperative performance is strongly influenced by trust in management, transparency, and effective governance (Molla et al., 2023). Poor governance and

limited member engagement prevent cooperatives from fully addressing market challenges, leaving farmers exposed to varying prices and unreliable market access.

Although previous studies have studied dairy production, market access, and cooperative management in Ethiopia However, little research has explored the correlation between the level of market integration and the livelihood performances of individuals at the cooperative level. The existing body of knowledge tends to emphasize the aspects of production efficiency, input delivery, and the delivery of services, failing to sufficiently connect these aspects with the economic and societal well-being of the individuals.

This study's main objective is to check the level of market integration among dairy cooperatives in D/Birhan and investigate its influence on the livelihood performance. Therefore, this study analyzes the market chain structure, and household performances. Finally, it will provide how it affects the economic wellbeing of dairy farmers at D/Birhan.

Despite the presence of relatively well-established dairy cooperatives and formal milk marketing systems in Debre Birhan, significant challenges remain in ensuring consistent market integration and improved livelihood performances for cooperative members. Farmers continue to experience unstable milk prices, limited access to risk-protective financial services, and uneven value chain coordination, which affect their income stability and overall livelihood performance. Although Debre Birhan is considered one of the emerging urban milk sheds with strong cooperative presence, there is limited empirical evidence examining how the level of market integration within dairy cooperatives directly influences the livelihood performance of their members. Existing studies have largely focused on production constraints and cooperative service delivery, with insufficient attention given to the relationship between market integration factors and household livelihood performances at the cooperative member level in this specific context.

Despite the presence of organized dairy cooperatives and relatively better market access in Debre Birhan, many cooperative members continue to face unstable milk prices, weak value chain coordination, and limited access to appropriate financial services, which negatively affect their livelihood performance. Although Debre Birhan is recognized as an important urban milk shed, there is limited empirical evidence examining how the level of market integration within dairy cooperatives influences the livelihood performance of their members. Most previous studies have focused on production and cooperative services rather than their direct impact on household livelihood performance at the cooperative level. Therefore, this study aims to fill this gap by

examining the level of market integration and its influence on the livelihood performance of dairy cooperative members in Debre Birhan, providing evidence to support improved cooperative and policy interventions.

Therefore, this study seeks to fill this empirical and contextual gap by examining the level of market integration and its influence on the livelihood performance of dairy cooperative members in Debre Birhan, thereby providing evidence to support cooperative strengthening and policy interventions aimed at improving farmers' economic well-being.

1.3 Research questions

How does value chain function like input supply, distribution, and milk quality standards affect the livelihood performance of dairy cooperative members in Debre Birhan?

How do physical and facilitation functions like transportation, access to finance, and physical infrastructure influence the livelihood performance of dairy cooperative members?

How do market linkage factors like market information and value chain coordination affect the livelihood of performance of dairy cooperative members?

1.4 Objectives of the study

1.4.1 General objective

To evaluate the change of marketing chain integration on the livelihood performance of dairy cooperative members in Debre Birhan, Ethiopia.

1.4.2 Specific Objectives

To assess the relationship between value chain components like input supply, distribution, and milk quality standardization and the livelihood performance of dairy cooperative members.

To find out the effect of physical and facilitating functions like transportation, access to finance, and infrastructure on the livelihood performance of dairy farmers.

To prove the effect of market linkages and value chain coordination on the livelihood performance of dairy cooperative members.

1.5 Hypothesis

Hypothesis 1

Input supply has a significant positive effect on the livelihood performance of dairy cooperative members.

Hypothesis 2

Distribution & Transportation has a significant positive effect on the livelihood performance of dairy cooperative members.

Hypothesis 3

Financial access has a significant positive effect on the livelihood performance of dairy cooperative members.

Hypothesis 4

Physical infrastructure has a significant positive effect on the livelihood performance of dairy cooperative members.

Hypothesis 5

Market information access has a significant positive effect on the livelihood performance of dairy cooperative members.

Hypothesis 6

Value chain coordination has a significant positive effect on the livelihood performance of dairy cooperative members.

Hypothesis 7

Milk quality standardization has a significant positive effect on the livelihood performance of dairy cooperative members.

1.6 Significance of the study

This study is important as it fills a critical gap of knowledge. It shows how a market chain integration affects the livelihood of dairy cooperative members in Debre Berhan. This place is the main milk production area in the country. By analyzing how the factors such as the input supply, transportation, market information, coordination, access to finance, milk quality

standards and physical infrastructure affects smallholder dairy farmers livelihoods. The research helps with the improvement of the efficiency of the dairy value chain by providing valuable inputs.

This research finds key obstacles and opportunities in the dairy market integrations. This information helps farmers to increase their income. It helps them get better access to profitable markets. It also improves relationships between dairy farmers and buyers and improves post-harvest handling and value additional activities.

The study also supports with the Ministry of Agriculture *10 years development plan (A Pathway to Prosperity, 2021–2030)*, which prioritizes dairy as a key commodity for commercialization and rural income growth (Ministry of Agriculture, 2020). The research can guide policymakers, development partners, and cooperative unions. It improves market network, increases income and improves household welfare among smallholder dairy producers.

This research contributes to the national goals of promoting agricultural transformation, rural livelihood improvement and food security. It can also be a model for the other diary areas in Ethiopia. It shows a framework for the understanding of how better integrated market systems can lead to sustainable livelihood income for the small holder farmers.

1.7 Scope of the study

This study investigates how market chain integration affects the livelihood of dairy cooperative members in the area of Debre Birhan. It also focuses only on smallholder farmers who are the members of dairy cooperatives in this area. The study looks at a lot of factors such as access to inputs, transportation, market information, cooperative services and prince linkages. The research does not cover the commercial dairy farms and non-cooperative member farmers. It also does not include other regions of Ethiopia, so the results may not include all dairy producers in the country. Hence, the scope of the study is both sector specific and bounded by location.

This study employed a mixed-methods approach, combining quantitative analysis using multiple linear regression and qualitative analysis using thematic analysis. Temporally, the study is based on one time data collected from dairy cooperative members in Debre Birhan during the period from November 2025 to January 2026.

1.8 Limitations of the study

This study has several limitations. First, many dairy farmers in Debre Birhan have low education which may affect their understanding of some questions. This can lead to simple or incomplete answers during the quantitative survey. Second, the study uses both quantitative and qualitative methods. While this provides rich information, it may also create differences between what farmers say in surveys and what key informants report during interviews or focus group discussions. Third, the interviews and focused group discussions with government officers, cooperative leaders, processors, and traders may show personal opinions or the interest of their organization. Finally, the research is limited to dairy cooperatives in Debre Birhan. The findings may not apply to other areas with different market systems or cooperative performance.

In addition, the study faced budget and time constraints, which limited the number of respondents and the depth of data collection. The non-response of some sampled farmers may also have affected the representativeness of the findings.

1.9 Organization of thesis

This study is organized into five chapters. Chapter one is about the study's background, problem statement, research questions, research objectives, significance, scope, limitations, and organization. Chapter two is about a literature review, summarizing existing knowledge in the field with theoretical and empirical review. Chapter three is about the study’s methodology, indicating research design, sample size, sampling method, data sources, data collection, and analysis method. Chapter four focuses on data analysis and the discussion of results. Lastly, Chapter five offers a summary of the key findings, conclusions, recommendations, and further research.

Chapter two

2. Literature review

The fact that the dairy industry has shown weak production, weak market links, and infrastructural gaps have challenges and opportunities for rural livelihoods. An examination of related literature helps to mark theoretical grounding and empirical evidence for the examination of linkage between value chain integration and farmers' economic and social well-being. This chapter takes conceptual, theoretical, and empirical studies of value chain integration and implications for the livelihood of dairy cooperative members.

2.1 Theoretical review

2.1.1 Livelihood Performance

Livelihood Performance are the measurable results of activities undertaken by individuals or households to secure a means of living. These may include additional incomes, increased assets, improved food security, and social wellbeing (Molla, 2024). The livelihood performance in dairy farming depend on market participation, stable income, ownership of assets, investment in education and health. According to (Molla, 2024) a better integration of Ethiopian dairy farmers into the market chain and better coordination among value chain actors influence the above-mentioned performances.

The theory of the Sustainable Livelihood Framework (Chambers & Conway, 1992) was mainly used to study performances. According to this framework sustainable livelihoods rely on five essential assets human, social, physical, financial, and natural capital. Good institutions are important too as they help individuals make good use of those assets. Those assets can be improved by market integration and membership in cooperatives. Another theory that explains the importance of institutions, cooperatives and contracts in determining the benefits from market participation and how it affects the household well-being is the Institutional Economics theory (North, 1990).

In regions like Debre Birhan, dairy production is one of the key economic activities of most families. Market chain integration has a direct and measurable impact on household well-being.

However, market challenges such as fluctuating prices during fasting periods and competition from informal traders have existed. Poor infrastructure also reduces farmers' earnings (Debele, 2012). Therefore, improving coordination, input access, and market linkages through cooperatives can help solve this problem. This may benefit farmers' livelihoods and enhance their household and local economic development.

2.1.2 Market chain integration

The definition of Market Chain Integration is to connect all actors within a value chain. The actors include producers, processors, distributors, and consumers. They are linked in an organized way that makes it easy to move products, share information, and distribute benefits along the chain. Integration can be vertical, connecting the farmers to processors and retailers or horizontal, which strengthens collaboration between the producers themselves. (Porter, 1985; Kaplinsky & Morris, 2001)

Concerning the dairy market In Ethiopia, market chain implementation can be influenced by the structure of cooperation that allows small holders to take part in coordinates milk marketing chains (Desalegn & Eweg, 2018)

It's because market chain integration helps to reduce the cost of transactions, assuring quality, and helps in ensuring that benefits are fairly distributed by all parties in the value chain (Kuma, et al., 2022)

Kotler's marketing framework highlights that a well-integrated market aligns a product, price, place and promotion (the 4Ps) across all the value chain actors to enhance competition (Kotler & Keller, 2016). Kotler and Armstrong also show that integrated markets help with producers in getting better buyers, cutting costs and competing effectively (Kotler & Armstrong, 2011).

The value chain theory (porter, 1985) supports this, which emphasizes that competitive advantage is achieved when all activities within the chain are efficiently coordinated to create and deliver value. According to porter, strong links between producers and buyers determine how much value is placed by farmers. In the perspective of Ethiopia, where milk markets are mostly informal, the lack of formal Integration limits the farmers ability to access stable and profitable markets (Wageningen University & Research, 2019).

Furthermore, the value chain theory adds to this study in terms of highlighting how the dairy value chain system in which weakness in one part of it which are processing, transportation or market connectivity will affect the system as a whole (Porter, 1985). In areas such as D/Birhan, in which small holder dairy producers are the main suppliers of milk to Addis Ababa, Integration enables proper synchronization of production with patterns of consumption to improve livelihood performance.

2.1.3 Value chain coordination

Value chain coordination means how well the collaboration, control, and communication exists among actors in a value chain. It aligns production activities, quality standards, and pricing systems in order to ensure the smooth functioning of the market (Kaplinsky & Morris, 2001). Smallholder dairy farmers in Ada'a Berga district market is controlled by a few major players which makes it difficult for the smallholder farmers to control the market. This makes weak coordination within the dairy sector's value chain. Because information flow and market pricing are monopolized by a few players, enhancing coordination in the dairy sector's value chain can improve smallholder farmers' involvement and income (Ordofa et al., 2021). Coordination among actors through formal cooperative, contractual agreements, or informal partnership influences how value is allocated within producers, processors/ factories, and retailers (Molla, 2024). In the dairy sector in Ethiopia, Cooperatives play a crucial role in managing and overseeing milk collection, ensuring quality, and improving producers' access to markets (Molla, 2024).

The Global Value Chain Governance Theory (Gereffi et al., 2005) has effectively described the concept of coordination, which addresses how regulating arrangements such as market, modular, relational or hierarchical governance structures influence the flows and control over information resources within actors. For example, when cooperatives entertain rational governance, this encourages trust and collaboration, which leads to equitable allocation of benefits and better price for producers. In contrast, if the market system is un-organized, the probability of them serving as a risk to producers might manipulate their gain.

Similarly, the Institutional Theory, as proposed by (North, 1990), also sheds some light regarding the importance of rules and social norms in an attempt to promote coordination. Good

cooperative by-laws, good management, and leadership are some of the important factors that can promote coordination along the dairy value chain. Research conducted in Ethiopia, Ada'a, as well as Wolaita, shows that well-coordinated cooperatives can promote improved quality, improved price, as well as improved well-being, as proposed by (Kuma, 2012). It, therefore, goes without saying that enhancing coordination along the value chain is extremely important, as it promotes trust, ensures efficiency, and a sustainable living standard, as seen in the town of Debre Birhan.

2.1.4 Input

Input supply is another crucial part of the supply chain in the dairy market. By input supply, the market refers to the supply of feeds, breeding services, veterinary services, and the general equipment needed in the production of milk. The supply of these services is the core determinant of the level of productivity and the income of the producers (Tegegne, 2017). In the case of Ethiopia, the supply of the needed input is influenced by the poor market infrastructure and the cost of the input, which makes the producers opt for the informal market Yami, et al.,2012).

The sustainable livelihood framework (Chambers & Conway 1992; DFID 1999) asserts that dairy farmers with reliable access to high-quality resources have higher opportunities to maintain their productivity and achieve their income sustainability. On another note, Institutional Economics Theory (North 1990) highlights how market imperfections in information and transaction costs undermine dairy farmers' capacity to utilize production factors efficiently.

The dairy cooperative has an important role in the purchase of inputs in Ethiopian, which helps in achieving economy of scale as well as in negotiation power (Molla, et al., 2023). Yet, issues exist in the timely distribution of inputs, coordinating suppliers, as well as infrastructure.

In the case of Debre Birhan, the dairy production industry is on the increase because of its proximity to Addis Ababa.

Improvement in the existing supply chain systems through the cooperation and intervention of the government could lead to improved productivity among the small producers.

2.1.5 Distribution and transportation

Distribution and transport are some of the value chain elements. It enables the timely distribution of milk from dairy farms to the processors as well as the consumers, besides maintaining the quality of the milk. The use of efficient logistics in the dairy industry ensures that there is minimal spoilage of the product, besides protecting the income of the dairy farmers. Lack of transport infrastructure and cold storage space has also been cited as a major problem affecting the dairy industry in Ethiopia (Molla, et al., 2023).

The role of cooperative and private middlemen in collecting, storing, and distributing milk is inefficient, especially in the rural areas of our country, where transportation might be a problem. (Kuma et al., 2022).

In a theoretical understanding, the Systems Theory, (Von Bertalanffy in 1968), provides a general insight of the importance of distribution and transportation in a value chain. The theory suggests that everything in a system works together. Any problem in a distribution area would affect the efficiency of a particular value chain. 1985 Porter value chain theory suggests that logistics or distribution is a crucial service activity that directly increases a particular value chain. Good distribution channels improve a particular value chain through reduced costs assurance and satisfaction.

In the case of Debre Birhan, the dairy industry sector is expanding due to the area's proximity to Addis Ababa.

An improved supply chain system can be achieved through cooperation and the government's intervention. Productivity and livelihood can be improved among the small-scale producers.

2.1.6 Market information access

Access to market information is critical to dairy producers. This helps them make necessary production and marketing decisions. Market information involves information necessary for prices, preferences, demand, and quality. Market information access helps improve transparency and ensures that producers align production and marketing programs to attain maximum profits (Tegegne, et al., 2018). In Ethiopia, there is a lack of communication and institutional arrangements that have created a disparity of information between producers and traders. This makes producers less powerful compared to others (Tarekegn & Shitaye, 2022).

However, the Institutional Economics Theory (North, 1990), in particular, could be seen as an important conceptual framework in understanding the implications of the absence of information in the market in terms of inefficiency. The presence of information asymmetry could be seen as leading to transactional costs in the process, hence creating opportunities for 'opportunism' on the part of actors in the value chain, leading to inefficiency in the value chain. The Value Chain Theory (Kaplinsky & Morris, 2001) highlighted the importance of information in coordination, performance management, and innovation in the value chain. Information has been seen in the Sustainable Livelihood Framework (DFID, 1999) in terms of 'social capital' in enhancing the capacity to respond to opportunities or changes in the market.

2.1.7 Financial access

Financial inclusion means that the farmer can get and use financial services like loans, savings, and insurance. This lets farmers put money into their dairy business. Financial inclusion will let the farmer buy better breeds, feeds, and tools to make more milk and earn more money at home Goshme & Dadi 2024).

The Sustainable Livelihood Framework (Chambers & Conway, 1992; DFID, 1999) identifies financial capital as one key element needed to achieve sustainable livelihoods. It plays an important role in providing short-term productivity benefits while also being essential for resilience against economic shocks. North's Institutional Economics Theory (North, 1990) points out that the efficiency of market and policy institutions is significant for access to financial institutions.

Credit Market Imperfection Theory (Stiglitz & Weiss, 1981), which provides very strong ground to understand how lack of information between lenders and borrowers restricts credit access to small-scale farmers. Most cooperative societies in Ethiopia provide members with credit from other members or from the cooperative society itself; these sources do not have enough capital. There could be a close relationship between dairy cooperative societies and microfinance organizations that would cover this gap. In places like Debre Birhan, where dairy farmers have good market potential because they are near Addis Ababa, better access to finance will directly help raise productivity.

2.1.8 Physical infrastructure

Roads, milk collection points, cold storage facilities, power supply and the like physical infrastructures are crucial for the efficient working of the dairy value chain. Proper infrastructure ensures the availability of milk on time, decreases the loss of milk, and increases market accessibility (Kebede, et al., 2020). In Ethiopia, it has long been observed that a lack of infrastructure in the rural areas has emerged as one of the most important constraints in the commercialization of agriculture, including dairy production (Kuma, 2012). Limited access to improved roads and cold chain logistics constrains producers' ability to reach markets while maintaining product quality.

2.1.9 Milk quality standardization

According to a study (Kuma, et al., 2022) the quality of milk Standardization refers to the setting and execution of hygiene, safety, and compositional standards throughout the production, collection and processing steps of the dairy value chain, as quality of the milk enhances consumer trust, increases market competitiveness and improves the farmers profit. In Ethiopia, the quality of the milk is compromised by mishandling practice, the inability of the cooling facilities, and substandard quality control systems at collection and processing points (Kuma et al., 2022). According to the value chain theory (porter, 1985), adhering to the quality of the standards helps the farmers to get a better selling prince and stand out in the market. Ensuring that all the activities in the value chain meet specific quality benchmarks, producers (farmers) can gain a higher value through a premium pricing and market differentiation.

The institutional theory of economics (Von Bertalanffy, 1968) emphasizes ensuring the milk quality needs coordination among the different interdependent actors, from farmers and logistics to processors and retailers.

In Ethiopia, the dairy value chain sector cooperative are significant actors in setting and monitoring the quality standards through continuous training, production equipment provision and inspection systems (Tefera, 2008).

2.2 Empirical literature review

Studies conducted on the dairy sector of Ethiopia have greatly emphasized the aspect of market integration and participation in cooperatives toward achieving better livelihood performance.

However, specific differences exist in the degree and nature of such relationships across regions as a function of input supply systems, infrastructure development, access to finance, and mechanisms for market coordination. It is evidenced that value integration has been perceived by some as having an opportunity to increase smallholder income, enhance milk quality, and improve sustainability in the market; however, this integration does not take place uniformly everywhere. Very few studies have been undertaken on how these factors affect household livelihoods when they do not operate uniformly across areas, particularly Debre Birhan, where dairy activities are highly connected with Addis Ababa's market.

Input supply and productivity-related studies indicated that input supplies through cooperatives are meant to enhance milk yield and subsequently farmers' income. Dairy cooperatives provide access to improved breeds, quality feed, as well as veterinary services, which have enabled members achieve production efficiency and profitability much higher than non-members (Chagwiza, et al., 2016).

In the same vein, a study in Oromia and Amhara regions revealed that improved networks for input distribution significantly reduced production costs while increasing cooperative participation. Organized supply of feed and artificial insemination (AI) services through cooperative linkages was associated with higher milk yield and better herd productivity (Yami et al., 2012). Improved input access allowed farmers to increase productivity and household livelihoods (Tefera, 2008). Collectively, these studies indicate that input supply efficiency can be the basis for value chain performance, but very few have looked at how improvements trickle down into broader livelihood impacts.

Findings from the southern and central highland areas showed that bad road conditions, absence of cooling storage spaces, and ineffective milk collection centers add to spoilage and instability of income (Diro et al., 2019). In Wolaita Zone, cooperatives with a refrigerated transport system and a well-constructed milk collection center enjoyed better prices for their milk with low spoilage rates (Kuma, 2012). Also, improvements in cooperative infrastructure in Ada'adiary, especially the establishment of chilling centers and access roads, improved market access as well as farmer income (Debele, 2012).

Access to finance is another major factor that influences market chain participation and household welfare among Ethiopian dairy farmers. Availability of credit and cooperative schemes has a positive effect on productivity and profitability among the small holders (Debele,

2012). The Ministry of Agriculture (MoA, 2020) also reports that dairy producers with access to cooperative-based loans invested more in feed, animal health, and expansion of production, which subsequently led them towards better living standards. Financial institutions are accessible more easily for farmers using cooperative credit in managing market problems with higher income stability (Diro et al., 2019). Though it is generally known that access to finance helps farmers in other parts of Ethiopia, no such evidence exists as yet specifically looking into its role in Debre Berhan.

Market linkage and coordination among the dairy value chain actors are consistently shown to determine the efficiency of milk flow. Systematically organized cooperatives earned marginally higher returns than those using informal ones, mainly due to better price negotiation and decreased dependency on middlemen (Yigerm et al., 2008). Studies have found that well-coordinated value chains build trust and make good relationships among producers, processors, and traders (Debele, 2012). Cooperative involvements in the Sidama region lowered transaction expenses and increased price stability of milk (Chebura et al., 2025). However, market coordination is still very weak in most highland areas. Informal traders control the milk trade by a very large margin, leading to an unstable price and income ratio for farmers.

Milk quality and standardization have also been studied in a lot of Empirical studies. Research from a study showed that up to 20% of milk that is collected failed to meet the hygiene standards due to poor handling and lack of testing facilities (Yigerm et al., 2008). The Ada'a Dairy Cooperative similarly executes quality control mechanisms, including laboratory testing and farmer training, which results in improved market access and premium prices (Tefera, 2008). It was also found that meeting the quality of milk standards was positively correlated with a higher producer income and stronger buyer confidence (Haile, 2022).These studies suggest standardization is an essential factor for the improvement of competition, mainly in markets like Addis Ababa, where consumers' demand for quality is high. However, the data remains rare on how improved quality control translates into long-term livelihood performance for the cooperative members, especially in the regions of Amhara.

Research carried out in North-Western Ethiopia showed that cooperative members were characterized by higher levels of income, better lives, and access to education compared to non-

members (Molla et al., 2023). Through improved dairy farming in integrated value chains, dairy agricultural practitioners could raise their revenues by accessing different sources, increasing their wealth, and having more secured foods compared to before (Kebede, et al., 2020). The MOA reported in 2020 that in terms of strength in withstanding seasonal price changes, dairy agricultural practitioners in Debre Birhan were stronger compared to those not in a cooperative society. However, little information has been acquired concerning strength integration in terms of dairy farming in Debre Birhan, more so because of its key role in milk supply to Addis Ababa.

So, overall empirical evidence from Ethiopia shows that the input supply, infrastructure development, financial access, market coordination, and quality control are the most important for dairy farmers. But even with a lot of research in different regions, small studies looked at how these factors work together to affect farmers' livelihoods in Debre Berhan. The proximity of the area to Addis Ababa, its high milk production potential, and its exposure to both the formal and informal market systems make a unique context that has not been well studied. Therefore, this research provides new empirical insights into Ethiopia's dairy development policy and cooperative-based market strategies.

2.3 Hypothesis formation

Hypothesis 1

There is a significant positive relationship between value chain function and livelihood performance of dairy cooperative members in D/Birhan.

Literature highlights the importance of core value chain functions like input supply, distribution & transportation and milk quality standardization improve livelihood performance in the dairy sector.

Access to quality inputs including feed, improved breeds and veterinary services increase productivity and milk yield (Kebede, et al., 2020). Efficient distribution & transportation system reduce post-harvest losses and spoilage. It increases profit and household income (Tegegne et al.,2018). Quality milk standardization improves market acceptance, enables higher pricing, and strengthens trust with value chain actor (FAO, 2019). Together these value chain functions contribute to higher farmer income, food security and overall livelihood performance of dairy cooperatives members.

Hypothesis 2

There is a significant positive relationship between facilitating functions and the livelihood performance of dairy cooperative members in D/Birhan.

Facilitating functions, such as access to finance and physical infrastructure play a critical role in supporting the effective operation of dairy value chains. Financial access enables cooperative members to invest in improved dairy technologies and expand herd size. Which increase production lead to increase income. Physical infrastructure such as milk collection center and chilling facilities improves market access. It reduces costs and minimizes milk spoilage (Tegegne et al., 2018). Empirical studies in Ethiopia indicate that inadequate infrastructure and limited financial services are major constraints to dairy farmers livelihood performance.

Hypothesis 3

There is a significant positive relationship between market linkages and coordination the livelihood performance of dairy cooperative members in D/Birhan.

Market linkages and coordination such as market information and value chain coordination are important factors. Timely and accurate market information improves farmers bargaining power, price negotiation, and decision-making regarding production and sales (FAO, 2019). Effective coordination's among producers, cooperatives, processors, and traders reduces costs, improve trust, sustain price and improve market efficiency (Gereffi, et al., 2005). Empirical evidence indicates that weak coordination and information limit the income of dairy farmers.

2.4 Conceptual framework

The conceptual framework for this study proves how market integration (input supplies, distribution, transportation, physical infrastructure, access to market information, value chain coordination, access to finance, and milk quality standardization) affects farmers' income. Household Characteristics (Land size, herd size, farming experience, and education level) are control variables that provide an organized framework to test the effect of dairy cooperatives on members' livelihoods.

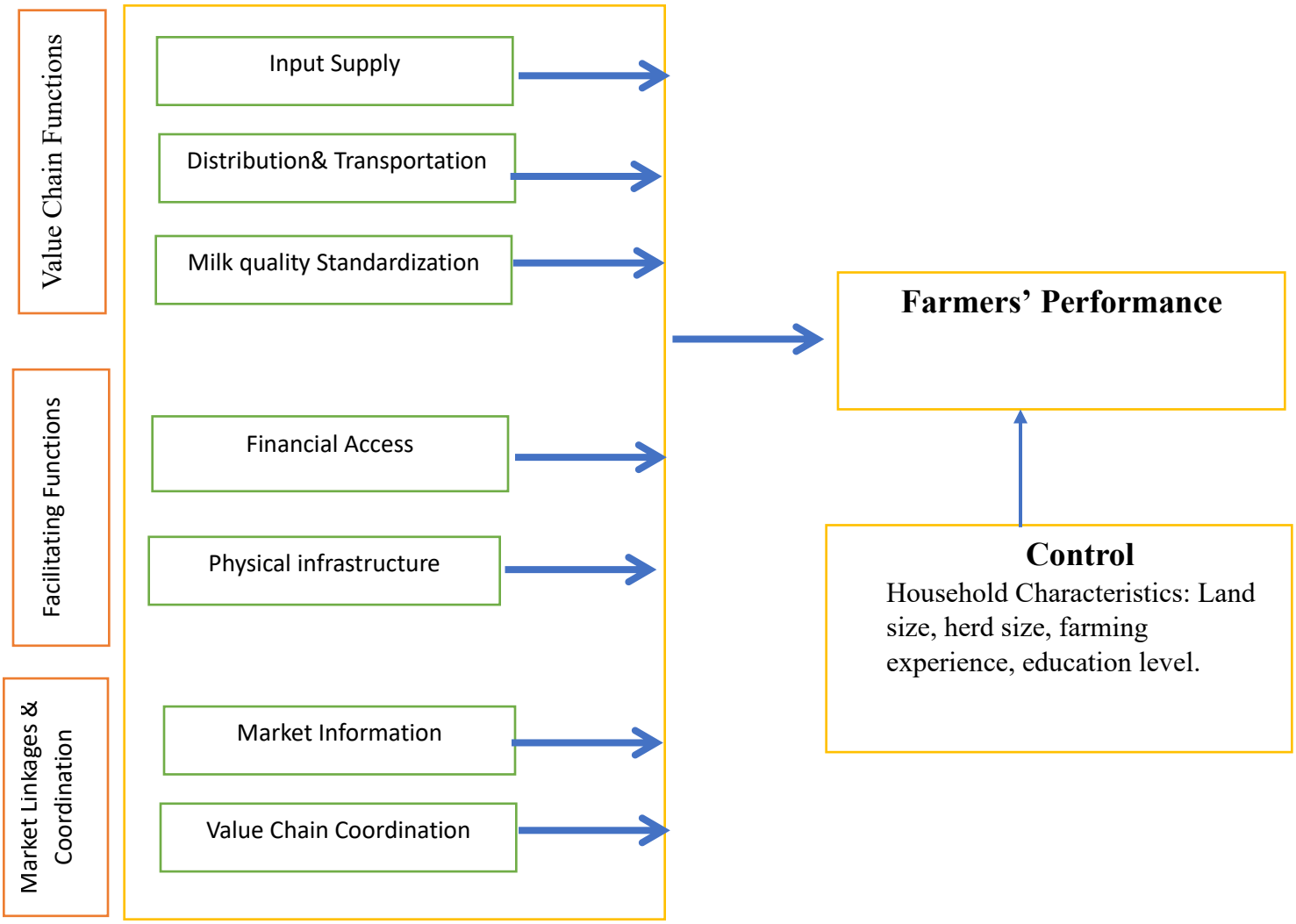


Figure 1 Conceptual Framework of the Study

Independent variables

Input Supply: This variable indicates the availability and access to the key inputs for dairy production, which include improved breeds, feeds, veterinary services, and artificial insemination (AI). It also evaluates the effect of timely and adequate delivery of these inputs on productivity, milk yield as well as general livelihood performances of farmers.

Distribution and Transportation: This variable assesses the adequacy of milk collection and transportation infrastructure, including cold chain facilities for maintaining quality. Adequate

transport reduces spoilage rates, widens market access, and helps farmers secure consistent incomes.

Milk Quality Standardization: This factor measures the extent to which the farmers and cooperatives adhere to the hygienic indications in the production, collection, and storage of high-quality milk to obtain a good price on the market.

Financial Access: Financial access enables farmers to invest in better inputs to increase their milk production as well as diversify their sources of income. This variable evaluates how easily farmers can obtain loans, credit, and savings services.

Physical Infrastructure: It represents the level of accessibility and development of facilities like roads, storage facilities and milk collection centers. Where the facilities are well developed the farmers will be able to transport the milk in a more efficient way and develop more links to the market.

Market Information Access: This variable assesses adequacy with which farmers are able to access reliable and timely information about milk prices, demand, and buyer requirements. Timely information enables farmers to make informed decisions that will lead them to secure better prices through strong negotiations.

Value Chain Coordination: Strong coordination among value chain actors enhances trust among chain actors improves operational efficiencies as well as strengthens bargaining power of farmers in the market. This variable assesses communication and collaboration between different actors within the dairy value chain: farmers, cooperatives, processors, and traders.

Dependent variable

Livelihood Performance: This variable captures the livelihood performance of members belonging to a dairy cooperative, an assessment on how well their children are going to school, what improvement has taken place in the homes, what assets they own (like animals or perhaps a small vehicle), and what an amount of money they make.

Chapter three

Research methodology

3.1 Introduction

This chapter illustrates the research design, approach, area of the study, and total population. It also how the sample is selected, how the data is collected, how to do it ethically, and the methods of data analysis. The study aim to find out how market chain integration affects the livelihood performance of dairy cooperative members in D/Birhan, Ethiopia.

3.2 Research design

The research used a mixed method design, which are quantitative and qualitative elements, for investigation of how market integration affects the livelihood performance. The quantitative part tests the independent variables (input supply, distribution and transportation, market information, financial access, value chain coordination, milk quality and physical infrastructure) affect the livelihood performance of the dairy cooperatives.

The qualitative parts include additional information by using interviews and focus group diss missions with farmers, traders, processors and government officials. This helps to add real pictures that are behind the numbers and prove the reality of the findings.

3.3 Research approach

The quantitative approach of this research is collected on structured data from the dairy farmers using a likert-scale questionnaire. It measures the market integration and its effects in Income, assets, and overall well-being. For the qualitative approach, it used interviews and focused group discussions. The target group for the focus group discussions are cooperative board members and hired staff. It helps to have a better understanding of the market systems, coordination problems and challenges of the sectors. Mixing these approaches gives clear and full pictures of how market integration affects livelihood performance.

3.4 Study area

This study was conducted in D/Birhan town. It is located in the Norh Shoa Zone of Amhara Region. The town is about 130 Km northeast of Addis Ababa. D/ Birhan town sits at around 2,750 meters above sea level and it has a highland climate. D/Birhan has a total population of around 107,886 people, with 48,901 men and 59,245 women (CSA,2022).

The study was carried out from February 2025 to January 2026, including both surveys with farmers and interviews with key stakeholders.

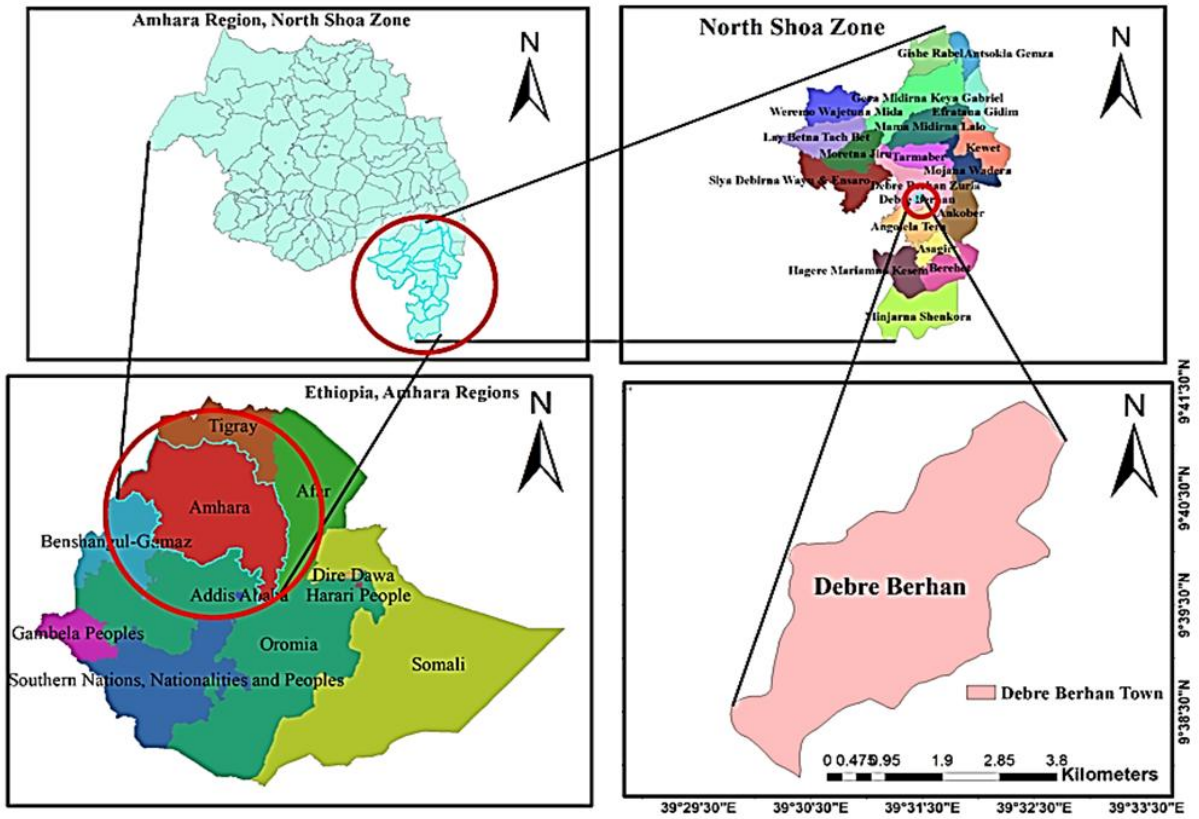


Figure 2 Maps of the study area

3.5 Sampling method and procedure

3.5.1 Target population

The total target population of the study area is 2,000 farmers who are members of the cooperatives. These farmers produce and sale milks to different marketing channel making them the main group affected by market integration.

In addition to this the qualitative parts the targeted key stakeholders are cooperatives, government officials, milk processors and individual traders in the D/Birhan. These participants were chosen based on their experience and role in the dairy value chain, proof the study captured both farmer-level and institutional perspectives.

3.5.2 Sampling selection

I used a random sample selection technique to select farmers from the cooperative membership list. This gave each member an equal chance of being included in the sample to minimize biasness of the data. For the qualitative part, 5-10 key stakeholders were selected using purposing sampling. These individuals were selected based on their knowledge in the dairy value chain. Their inputs provided a deeper understanding of how market integration processes, challenges, and opportunities in Debre Birhan.

3.5.3 Sample size determination

The sample size was determined using Korharis (2004) formula below.

N=2,000

$n=1+(N*e^{2)}$

Where:

n=sample size

N=target population

e =standard error (5%)

$N=\frac{2,000}{1+(2,000*0.05^2}$

n=333.33

This farmer was randomly chosen from the cooperative membership list using the lottery method.

3.6 Source of data and data collection methods

3.6.1 Data collection methods

I used structured questionnaires to collect the primary data from stallholder dairy framers who are members of the cooperatives at D/Birhan. The questionnaire contained 5-point Likert-scale

items designed to measure various components of market integration and their influence on livelihood performance. Individual farmers fill their level of agreement from strongly disagree (1) to strongly agree (5). Qualitative data were gathered through open interviews and focus group discussions (FGDs) with selected stakeholders, including cooperatives, government officials, dairy processors, and traders.

3.6.2 Data collection instruments

For quantitative data the tools that are used to collect the data are a questionnaire and for quantitative data I used interview and focus group discussion. I adopted these tools from different previous studies and edited them to fit with the local context.

3.6.3 Data collection procedure

First, I trained 4 university students about the objectives of these studies and how to do questionnaires. Then by using 333 farmers list the trained students conduct a questionary at milk collection center in the morning.

For the qualitative component, focus group discussions (FGDs) were held with 5 groups of cooperatives board members and hired staff. while key informant interviews were conducted with dairy processors, traders, and government officials. All discussions and interviews were conducted with prior consent, recorded for accuracy, and finally written down word-for-word for analysis.

3.6.4 Measurement and operationalization of variables

In this study, livelihood performance was the dependent variable, while the components of market chain integration serve as independent variables. Each variable was broken down into measurable indicators to make sure accurate and reliable data. A five-point Likert scale (where *1 = strongly disagree* and *5 = strongly agree*) was used so farmers could share their views and experiences on how market integration affected their livelihoods.

Livelihood performance was measured based on farmers' monthly income, housing conditions, and children's education. The indicators were adapted from (DFID's,1999) Sustainable Livelihoods Framework and previous dairy value chain studies.

The table below shows the definition, measurement, and expected effect of the main variables in the study.

Table 1 Measurement of Variable

Variables	Definition of the Variable	Measurement	Expected Effect
Input Supply	The availability and timely provision of quality dairy inputs such as feed, veterinary drugs, and artificial insemination services.	Likert scale (1 = strongly disagree to 5 = strongly agree)	+
Distribution and Transportation	The efficiency and reliability of milk collection, transportation, and delivery systems from farmers to markets or processors.	Likert scale (1 = strongly disagree to 5 = strongly agree)	+
Milk Quality Standardization	The degree to which milk handling, testing, and grading follow quality standards to meet market requirements.	Likert scale (1 = strongly disagree to 5 = strongly agree)	+
Financial Access	The ability of farmers to obtain financial services such as loans, credit, and savings for dairy production and marketing activities.	Likert scale (1 = strongly disagree to 5 = strongly agree)	+
Physical Infrastructure	The adequacy of physical facilities such as roads, storage, and cooling centers supporting dairy marketing activities.	Likert scale (1 = strongly disagree to 5 = strongly agree)	+
Market Information	The accessibility and accuracy of information regarding milk prices, market demand, and buyer requirements.	Likert scale (1 = strongly disagree to 5 = strongly agree)	+
Value Chain Coordination	The extent of collaboration, communication, and linkages among dairy value chain actors (farmers, cooperatives, traders, and processors).	Likert scale (1 = strongly disagree to 5 = strongly agree)	+
Livelihood Performance (Dependent Variable)	The perceived improvement in farmers' income, asset ownership, housing conditions, and access to education because of market chain integration.	Likert scale (1 = strongly disagree to 5 = strongly agree)	-

3.7 Methods of data analysis

The responses of 210 data collected were entered into SPSS statistical analysis. For socio economic characteristics, descriptive statistics were used.

Correlation between each variable were analyzed to show how each variables related to each other and strength of their relationship.

The regression assumptions were tested before the regression analysis. Finally multiple linear regression analysis was used to test the hypotheses and find out how market integration affects livelihoods performance. For qualitative data, NVivo was used for thematic analysis. This helped identify patterns, key themes, and relationships from interviews and focus group discussions. Finally the quantitative and qualitative data analysis are combined to give a clear picture on how market integration affects dairy farmers' livelihood in D/Birhan.

3.7.1 Econometric models

To analyze the effect of market integration on household performance the below multiple regression model were used.

$$Y=\beta_0+\beta_1 IS_1 +\beta_2 DT_2 +\beta_3 MQ_3+\beta_4 FA_4+\beta_5 PI_5+\beta_6 MI_6+\beta_7 VCC_7+AGE+\varepsilon$$

Where:

Y = Livelihood Performance

β_0 = Constant term

$\beta_1$to β_7= Regression coefficients

IS_1 = Input Supply

DT_2 = Distribution and Transportation

MQ_3 = Milk Quality Standardization, FA_4= Financial Access, PI_5 = Physical Infrastructure, MI_6= Market Information, VCC_7= Value Chain Coordination, AGE = Age of household head, ε = Error term

3.8 Reliability analysis

Checking the quality of the study reliability test is important. Therefore, Cronbach's Alpha was used using SPSS software to evaluate the internal consistency and reliability of the data. Cronbach's Alpha is a reliability measurement should exceeding 0.70 Nunnally (1978) and Hair et al (1998). As indicated in Table 2, the results confirm the reliability of the instruments utilized in this study.

Table 2 Reliability Test

Variables	Number of Items	Cronbach's Alpha (α)
Input Supply	10	0.935
Distribution & Transportation	10	0.951
Milk Quality	14	0.822
Financial Access	10	0.969
Physical Infrastructure	10	0.999
Market Information	10	0.999
Value Chain Coordination	12	0.969
Household performance	12	0.974

Source: (Own Survey, 2026)

3.9 Ethical considerations

The study followed all ethical rules. Participants were informed the purpose of the study and that participation was completely voluntary. They were also notified that they could stop at any time. Informed consent was obtained from all participants before collecting any data.

All answers were kept confidential, and no personal information appeared in the final reports. Audio recordings from interviews and focus groups were safely stored and will be deleted after the final defense. Ethical approval were obtained from the proper institutional body to make sure the study meets academic and professional standards.

Chapter four

Results and discussions

In this chapter, the data collected through questionnaires are presented, analyzed and interpreted. Data is analyzed based on the research objective. Accordingly, the chapter deals with general information of the respondents and presents detailed analysis and discussion of data collected and information obtained from administered questionnaires.

4.1 Descriptive Analysis of socio demographic factors

The demographic profile of the respondents was analyzed in this section, covering aspects such as gender, age, educational level, total years of work experience, herd size, herd compositions, other income & monthly income. The aim of this analysis was to provide a comprehensive background of the respondents. Thus, this section presents an overview of the respondents' characteristics based on the above mentioned factors.

4.1.1 Response Rate of Respondents

Table 3 Response Rate

Woredas	Total Distributed Questionnaire	Returned Questionnaire	Not Returned Questionnaire	Response Rate In Percentage
WushawusheKebele	65	50	15	77%
Genet Kebele	40	19	21	48%
Bakelo&KeyitKebele	60	38	22	63%
Chacha Kifleketema	68	45	23	66%
KabigizawKebele	50	28	22	56%
AngolelaKebele	50	30	20	60%
Total	**333**	**210**	**123**	**63%**

Source: (Own Survey, 2026)

Based on the survey results, the overall response rate of 63% (210 questionnaires returned out of 333 distributed) provides a solid and reliable foundation for this study.

4.1.2 Gender of the respondents

Figure 3 presents the gender distribution of respondents. The results show that 62.9% of the respondents were male, while 37.1% were female. This indicates that male respondents constituted the majority of the sample.

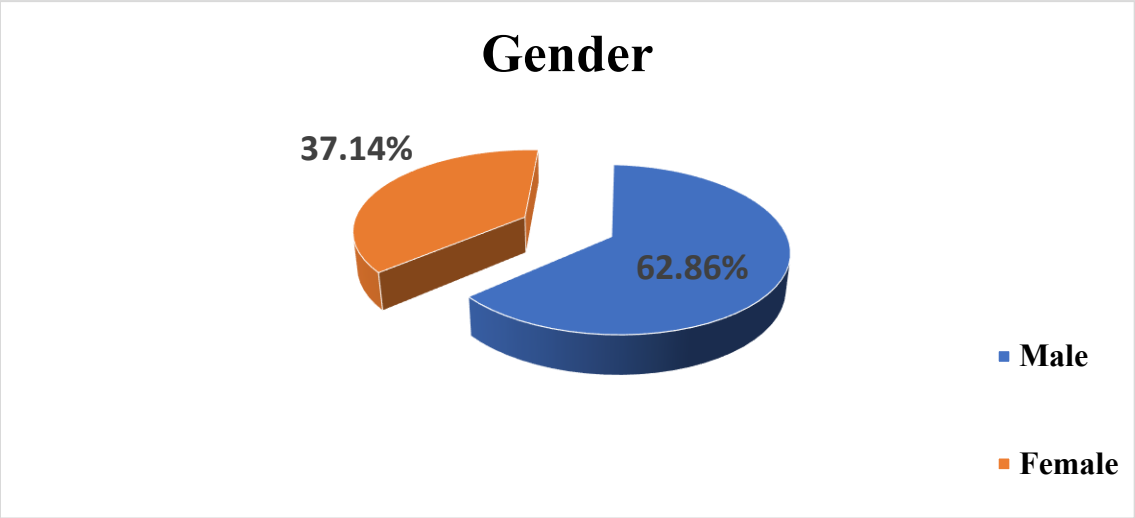


Figure3 Gender

Source: (Own Survey, 2026)

4.1.3 Age of the respondents

Figure4 presents the age distribution of the respondents involved in the study. The results show that the largest group of respondents, 35.7%, are above 50 years of age, followed by 28.6% in the 39 to 49 years category, and 25.2% in the 31 to 39 years range. Only 10.5% of the respondents are below 30 years old. The majority of respondents are older than their age.

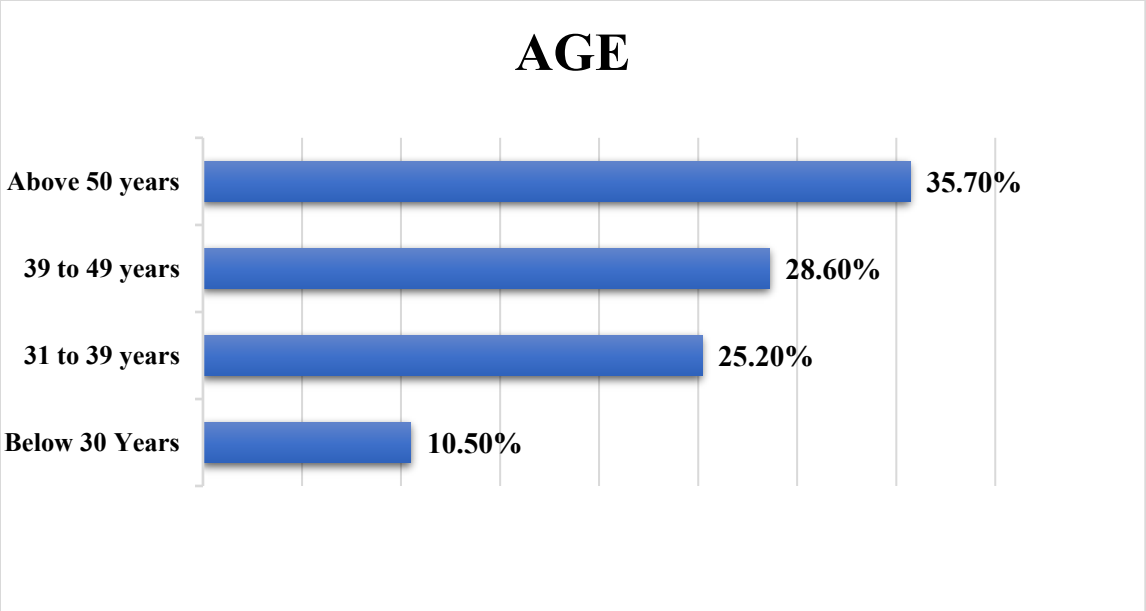


Figure4 Age Bracket

Source: (Own Survey, 2026)

4.1.4 Education of the respondents

Figure5 shows the educational level of respondents. Almost half of the respondents (46.2%) are no formal education. This figure shows the majority of dairy cooperative members have low level of formal education.

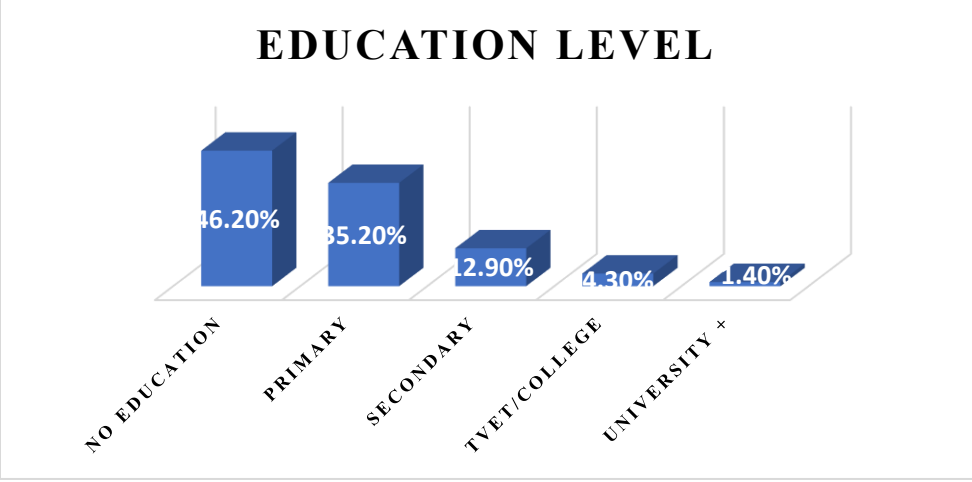


Figure 5 Educational Level

Source: (Own Survey, 2026)

4.1.5 Experience in farming of the respondents

Figure 6 shows respondents experience in dairy farming. The majority of respondents are well experienced in dairy farmers.

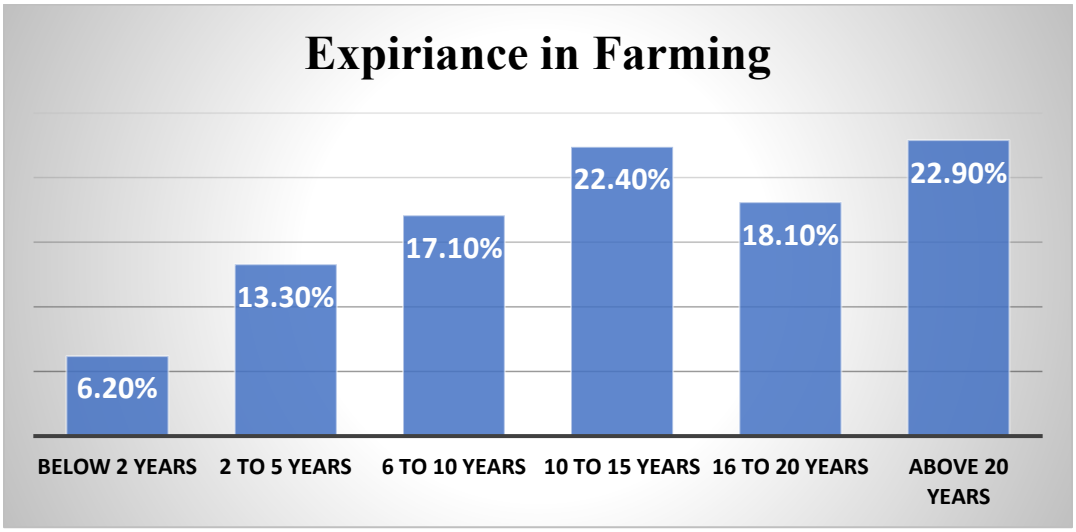


Figure 6 Experience in farming

Source: (Own Survey, 2026)

4.1.6 Herd size of the respondents

Figure 7 presents respondents herd size. The results show that the majority of respondents (44.8%) owned 2 cows, followed by 35.7% owning 1 cow. Herds of 3 cows were reported by 14.3% of respondents, while only 3.8% and 1.4% of respondents had 4 and 5 cows, respectively. This indicates that most dairy households in the study area maintain small herds, which is typical for smallholder dairy farming systems.

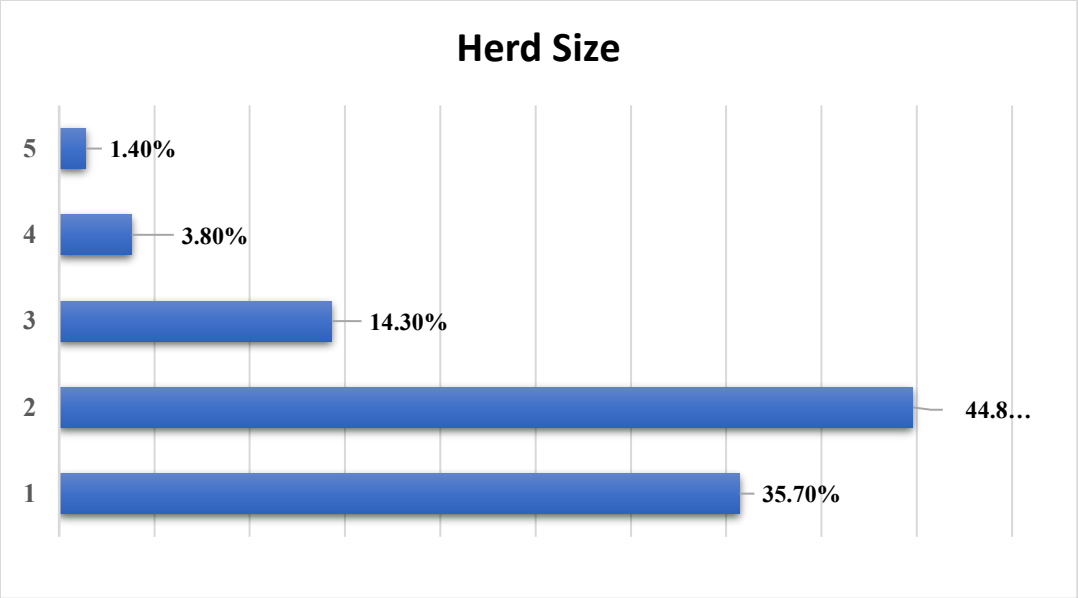


Figure 7 Herd Size

Source: (Own Survey, 2026)

4.1.7 Herd composition of the respondents

Figure 8 presents the composition of respondents' herds. The findings indicate that many respondents (98.1%) have hybrid dairy cattle, while only 1.4% have purely local cows and 0.5% have purely exotics cows.

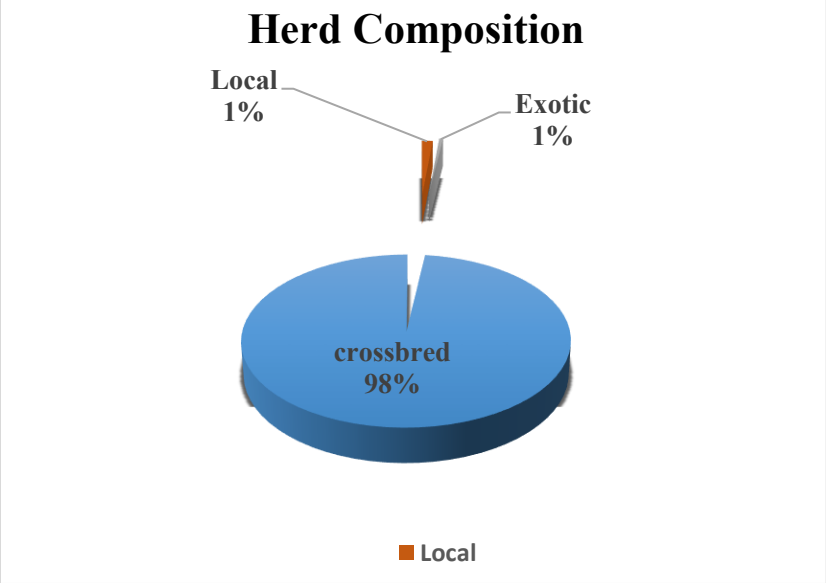


Figure8 Herd Composition

Source: (Own Survey, 2026)

4.1.8Main other income of the respondents

Figure9 shows the main other income sources of respondents besides dairy. The majority of respondents (73.8%) rely on crop sales as their primary source of additional income, while 26.2% have other income sources. This indicates that crop production is the most common supplementary livelihood activity among dairy farmers in the study area.

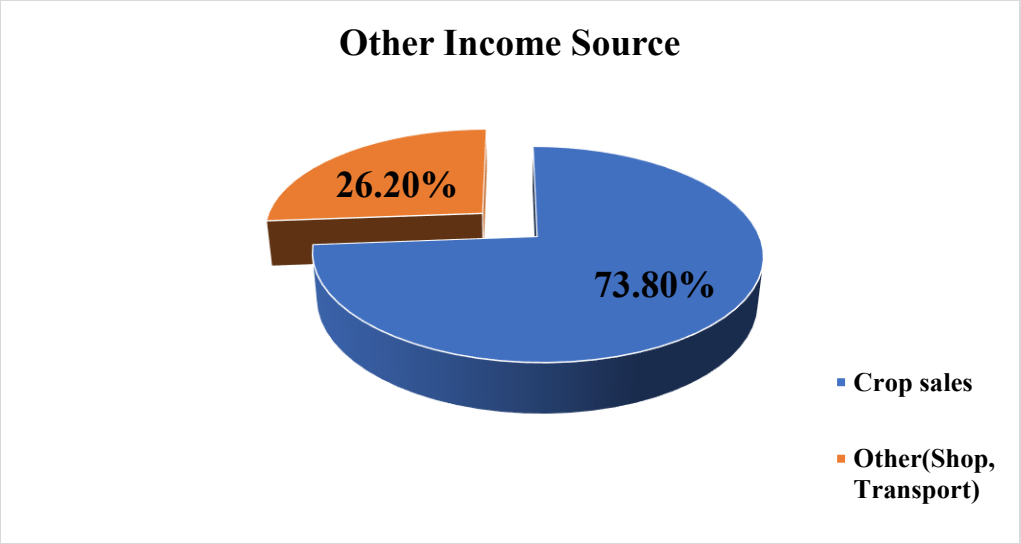


Figure9 Main other income sources

Source: (Own Survey, 2026)

4.1.9 Monthly Dairy Income of the Respondents

Figure 10 presents the monthly income of dairy farmers in D/Berhan. The average farmers' monthly income is around 19,300.00 ETB.

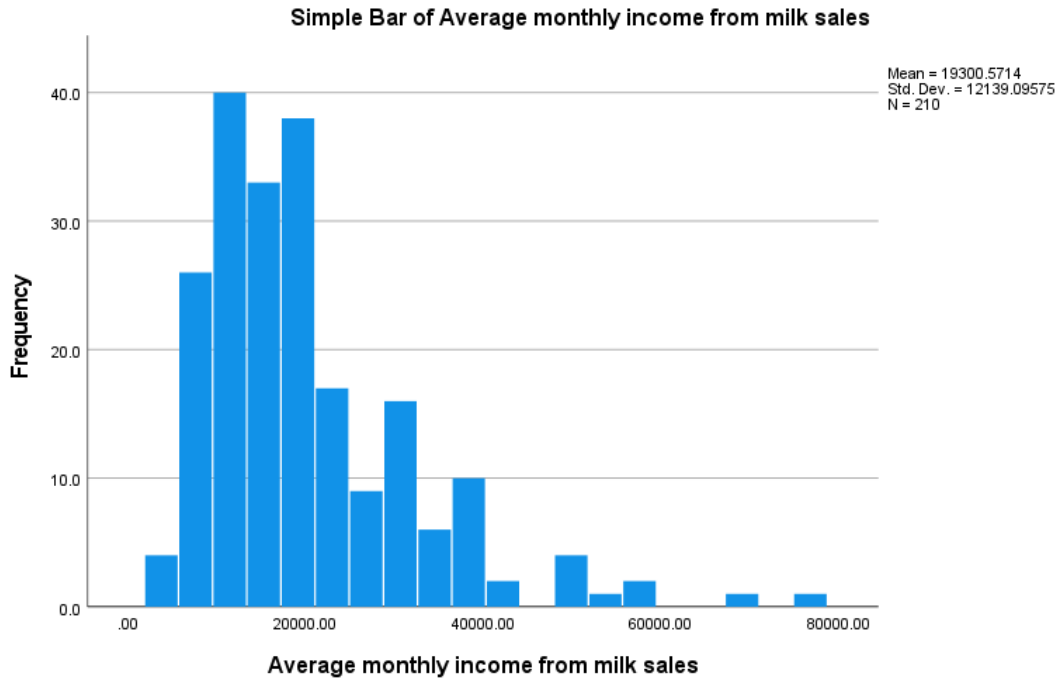


Figure 10 Farmers monthly income

Source: (Own Survey, 2026)

4.2 Descriptive statistics of main study variables

The total responses of 210 dairy cooperative members show a moderate level of household livelihood performance. It has a mean score of 3.36 (SD=0.67) indicating relatively similar performance levels among respondents. The mean score for input supply is 2.64 (SD=0.78).It reflects weakness to moderate access to production inputs. While the Value chain coordination has a mean of 2.93 (SD = 0.94). It indicates a moderate level of coordination with noticeable variation among members. Financial access records with comparatively low mean of 2.11 (SD = 0.84). It means limited access to credit and financial services. In comparison, distribution and transportation shows a high value of mean of 4.52 (SD = 0.52). It indicated very high and consistent transportation services. Market information access comparatively is good, with a mean score of 3.60 (SD = 0.88). The value of the mean for milk quality standardization is 4.11 (SD = 0.27). There are high and similar milk quality practices across the cooperatives. Likewise physical infrastructure, including milk collection centers and cooling storage facilities, records a high mean of 4.58 (SD = 0.73). It shows well-established infrastructure support.

Table 4 Descriptive Statistics

Descriptive Statistics

	N	Mean	Std. Deviation
Household performance	210	3.3552	.66693
Input Supply	210	2.6371	.78145
Distribution & Transportation	210	4.5210	.51600
Milk Quality	210	4.1078	.26983
Financial access	210	2.1076	.83748
Physical Infrastracture	210	4.5771	.72906
Market Information	210	3.5971	.88301
Value Chain Coordination	210	2.9317	.94223
Valid N (listwise)	210		

Source: (Own Survey, 2026)

4.3 Correlation analysis

Based on the correlation analysis, the relationship between household performance and various market integration factors show mixed results. Household Performance shows a strong, statistically significant positive correlation with Input Supply ($r = .752$, $p < .001$) and Value Chain Coordination ($r = .768$, $p < .001$). This indicates that improved access to inputs and better coordination within the dairy value chain are strongly associated with higher household performance. Correlation is also found with Financial Access ($r = 0.538$, $p < 0.001$). It suggests that better access to credit and financial services contribute positively to livelihoods. The other variable are non-significant like, Market Information ($r = 0.127$, $p = 0.065$), Distribution & Transportation ($r = -0.035$), Milk Quality ($r = -0.098$), and Physical Infrastructure ($r = -0.011$). It implies that while these are present, they are not direct drivers of performance differences among households.

Among independent variables like Input Supply, Value Chain Coordination, and Financial Access are all strongly and significantly correlated with each other (r ranging from 0.731 to 0.830, $p < 0.001$). It indicates that these constraints are closely linked and likely reinforce one another. A separate strong relationship exists between Distribution & Transportation and Physical Infrastructure ($r = 0.601$, $p < 0.001$), confirming they form a distinct logistical cluster. In conclusion, the results highlight that Value Chain Coordination, Input Supply, and Financial Access are the most critical, interlinked factors associated with improving household performance. Whereas the existing strengths in infrastructure and logistics, while important, do not in themselves explain differences in household performances.

Table 5 Correlation analysis

Correlations									
		IS	VCC	FA	D&T	MI	MQ	PI	Age
Household performance (HP)	Pearson Correlation	.752**	.768**	.538**	-0.035	0.127	-0.098	-0.011	-0.020
	Sig. (2-tailed)	<.001	<.001	<.001	0.615	0.065	0.157	0.869	0.771
Input Supply (IS)	Pearson Correlation	1							
	Sig. (2-tailed)								
Value Chain Coordination (VC)	Pearson Correlation	.830**	1						
	Sig. (2-tailed)	<.001							
Financial access (FA)	Pearson Correlation	.731**	.825**	1					
	Sig. (2-tailed)	<.001	<.001						
Distribution & Transportation (DT)	Pearson Correlation	0.008	0.017	0.050	1				
	Sig. (2-tailed)	0.908	0.810	0.467					
Market Information (MI)	Pearson Correlation	.151*	.206**	.215**	0.039	1			
	Sig. (2-tailed)	0.029	0.003	0.002	0.574				
Milk Quality (MQ)	Pearson Correlation	-0.133	-0.088	-0.091	0.056	<.001	1		
	Sig. (2-tailed)	0.055	0.206	0.188	0.421	0.998			
Physical Infrastructure (PI)	Pearson Correlation	0.021	0.011	0.020	.601**	0.115	0.041	1	
	Sig. (2-tailed)	0.762	0.869	0.775	<.001	0.098	0.551		
Age	Pearson Correlation	-0.028	0.023	-0.049	0.026	-.248**	0.040	-0.040	1
	Sig. (2-tailed)	0.683	0.740	0.482	0.705	<.001	0.561	0.568	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: (Own Survey, 2026)

4.4 Regression analysis

Five assumptions were verified to confirm that the data fulfil the requirements before regression analysis.

4.4.1 Ordinary least square (OLS) assumptions result

This process is important to ensure the accuracy of explaining the relationships between dependent and independent variables. Therefore, five assumption tests of the Classical Linear Regression Model (CLRM) linearity, homoscedasticity, autocorrelation, multicollinearity, and normality were tested below.

4.4.1.1 Linearity Test

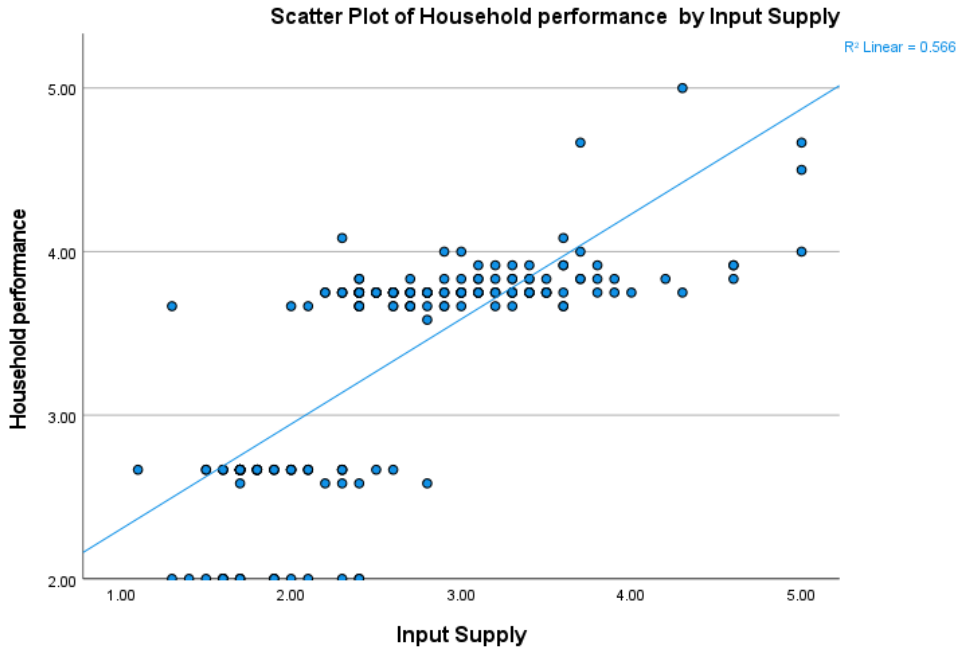


Figure11 Linear regression HOP as a function of Input Supply

Source: (Own Survey, 2026)

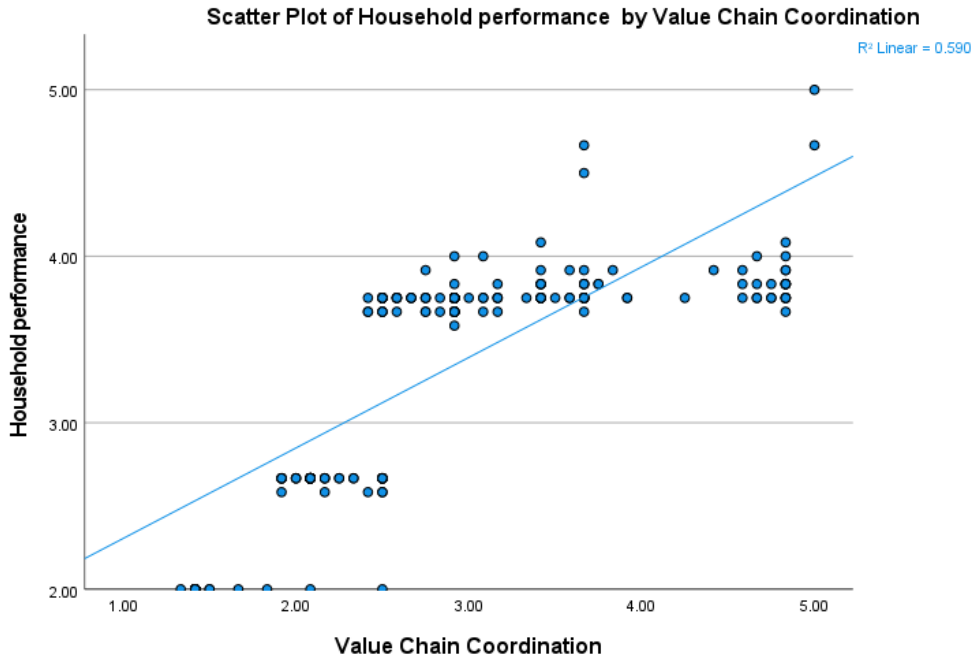


Figure 12 Linear regression HOP as a function of Value Chain Coordination

Source: (Own Survey, 2026)

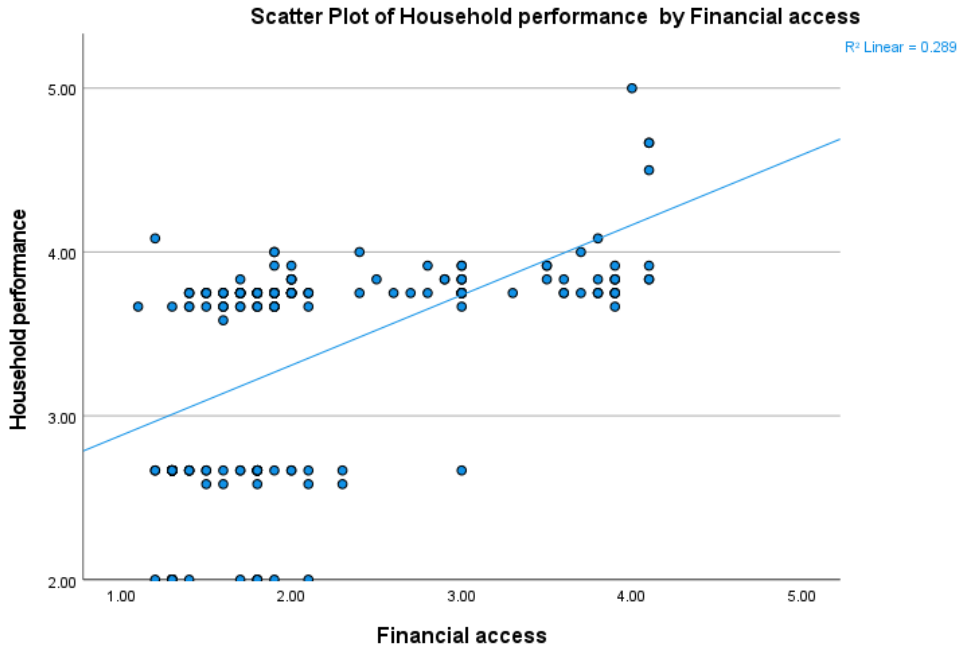


Figure 13 Linear regression HOP as a function of Financial Access

Source: (Own Survey, 2026)

The regression analysis shows that Value Chain Coordination (R^2= 0.590) and Input Supply (R^2= 0.566) are the main predictors of Household Performance. Individually it explains over 56% of

the variance. Financial Access also shows a positive linear trend, its impact is significantly lower only 28.9% of the performance performances (R^2= 0.289). These findings indicate that while all three factors are relevant, improving coordination and input delivery provides a much stronger contribution to household success than financial access alone.

In conclusion, these visual analyses confirm the prior correlation results. Value Chain Coordination and Input Supply are the most powerful and consistent linear predictors of household performance. Financial Access shows a meaningful but weaker linear relationship. The other variables like distribution and transportation, milk quality, Milk information and physical infrastructure show non-linear patterns. You can find the linear graph in the annex.

4.4.1.2 Normality of Residuals

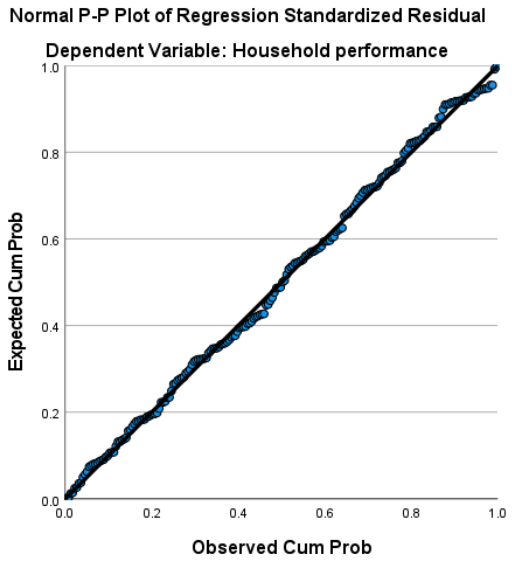


Figure14 Normality of Residuals

Source: (Own Survey, 2026)

Figure 14 illustrates the Normal P-P Plot of regression standardized residuals for the dependent variable, Household Performance. The results show that the observed data points closely follow the diagonal reference line without significant deviations. This pattern indicates that the residuals (errors) of the model are normally distributed, thereby satisfying the assumptions of multiple linear regression. Consequently, the p-values and coefficients reported in the regression table can be considered reliable for making inferences about the factors affecting dairy farmer performance in the study area.

4.4.1.3 Multi collinearity test

Table 6 presents the collinearity statistics for the independent variables to ensure that there is no excessive correlation between them. The results show that the Variance Inflation Factor (VIF) values for all variables range from 1.024 to 4.939, which are well below the commonly accepted threshold of 10. Similarly, the Tolerance values are all above 0.10, ranging from 0.207 to 0.977. This indicates that multicollinearity is not a concern in this model, confirming that each independent variable provides unique and independent information to the prediction of Household Performance.

Table 6 Multi collinearity test

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Input Supply	.297	3.363
	Distribution & Transportation	.630	1.588
	Milk Quality	.976	1.025
	Financial access	.306	3.269
	Physical Infrastracture	.627	1.596
	Market Information	.875	1.143
	Value Chain Coordination	.202	4.939
	Age	.912	1.096

a. Dependent Variable: Household performance

Source: (Own Survey, 2026)

4.4.1.4 Test of Heteroscedastic

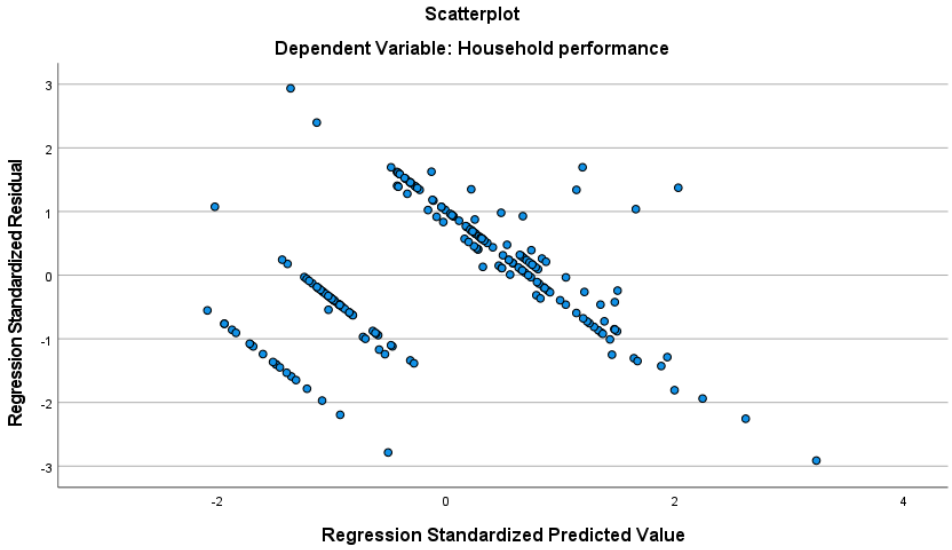


Figure 15 Test of Homoscedasticity

Source: (Own Survey, 2026)

Figure15 presents the scatter plot of regression standardized residuals against regression standardized predicted values to test heteroscedasticity. The results show that the data points are distributed across the plot without forming a clear funnel shape. It indicates that the variance of the residuals is relatively constant. While there are some linear patterns within the scatter, the overall spread confirms that the assumption of homoscedasticity is met. This further validates the use of a linear regression model, as it suggests the prediction errors are consistent across all levels of independent variables, such as Value Chain Coordination and Input Supply.

4.4.1.5 Autocorrelation test

Figure 16 presents the autocorrelation test. Using the Durbin-Watson statistics the autocorrelation results show 1.663. This which falls within the acceptable range of 1.5 to 2.5. This indicates there is no serious autocorrelation among the residuals.

Figure 16 Outlier test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.822[a]	.676	.663	.38726	1.663

a. Predictors: (Constant), Age, Value Chain Coordination, Distribution & Transportation, Milk Quality, Market Information, Physical Infrastracture, Financial access, Input Supply

b. Dependent Variable: Household performance

Source: (Own Survey, 2026)

4.4.2 Multiple linear regression analysis

4.4.2.1 Model Summary (R^2)

Table 7 shows model summary regression analysis. The result (R=0.822) indicates that there is a strong relationship between independent and dependent variables. The value of (R^2=0.676) indicates that 67.6% of the variation in household performance explained by the model. However, the value on $R^2$is not fully show the explanatory as the variable is increased. The adjusting R^2 shows us 66.3% of the variation in household performance explained by the independent variable. This indicates that there is a strong explanatory power for a cross-sectional livelihood. Overall, the model is statistically significant (F=52.361, df1=8, df2=201, P<001). It indicates that the set of explanatory variables jointly provides a good fit to the model.

Table 7 Consolidated Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.822[a]	.676	.663	.38726	.676	52.361	8	201	<.001

a. Predictors: (Constant), Age, Value Chain Coordination, Distribution & Transportation, Milk Quality, Market Information, Physical Infrastracture, Financial access, Input Supply

Source: (Own Survey, 2026)

4.4.2.2 ANOVA Results

Table 8 shows the ANOVA results for the model. The results indicate that the model is statistically significant ($p < 0.001$), which confirms that the independent variables jointly explain household performance.

Table 8ANOVA Table

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.819	8	7.852	52.361	<.001[b]
	Residual	30.143	201	.150		
	Total	92.962	209			

a. Dependent Variable: Household performance

b. Predictors: (Constant), Age, Value Chain Coordination, Distribution & Transportation, Milk Quality, Market Information, Physical Infrastracture, Financial access, Input Supply

Source: (Own Survey, 2026)

4.3.2.3 Regression Coefficients

Table 9 presents the coefficient results of the models. The results show that input supply and value chain coordination have a positive and significant effect on household performance. Financial access has a significant negative effect on household performance. Other variables (distribution and transportation, market information, milk quality, physical infrastructure, and age) are not statistically significant in the models.

Table 9 Regression Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.925	.497		3.876	<.001
	Input Supply	.353	.063	.413	5.608	<.001
	Distribution & Transportation	-.035	.065	-.027	-.535	.593
	Milk Quality	-.023	.101	-.009	-.225	.822
	Financial access	-.289	.058	-.363	-4.999	<.001
	Physical Infrastracture	-.004	.046	-.005	-.089	.929
	Market Information	-.012	.032	-.016	-.380	.705
	Value Chain Coordination	.516	.063	.728	8.161	<.001
	Age	-.030	.028	-.046	-1.097	.274

a. Dependent Variable: Household performance

Source: (Own Survey, 2026)

4.*4.3* Regression equation

Based on the regression coefficients the regression equation model is as follows.

$HOP_i=1.925+0.353IS_i-0.035DT_i-0.023MQ_i-0.289FA_i-0.004PI_i-0.012MI_i+0.516VCC_i-.030AGE+\varepsilon_i$

Where:HOP = Household performance (dependent variable)

IS = Input supply

DT = Distribution and transportation

MQ = Milk quality

FA = Financial access

PI = Physical infrastructure

MI = Market information

VCC = Value chain coordination

AGE=Age group

ε = Error term

4.4.4 Hypothesis testing

Hypothesis 1: There is a positive and significant relationship between value chain functions and the livelihood performance of dairy cooperative members. Based on the regression analysis results, input supply shows a statistically significant positive coefficient (β=0.413, P<0.001). It indicates that input supplies significantly affect livelihood performance. But distribution and transportation (β=-0.027, P<0.593) and milk quality standardization (β=-0.009, p=0.822), both show that they are statistically insignificant.

Although distribution and milk quality were statistically insignificant, the strong positive impact of input supply (β=0.413, P<0.001), provides sufficient evidence to reject the null hypothesis and support H1 confirming that value chain functions significantly influence livelihood performance.

Hypothesis 2: There is a positive and significant relationship between facilitating functions and the livelihood performance of dairy cooperative members. The regression results indicate that financial access has a statistically significant but negative coefficient (β=-0.363, P<0.001), which contradicts the expected positive relationship. Physical infrastructure (β=-0.005, P=0.929) was found to be statistically insignificant.

These findings show that facilitating functions do not positively contribute to livelihood performance in the study area as hypothesized. Therefore, the null hypothesis is accepted, and the hypothesis H2 is rejected.

Hypothesis 3: There is a positive and significant relationship between market linkages and coordination and the livelihood performance of dairy cooperative members. The regression analysis results show that value chain coordination has a statistically significant positive coefficient (β=0.728, P<0.001), but market information (β=-0.016,P<0.705) was statistically insignificant. The strong positive effect of value chain coordination confirms the importance of coordinated relationships among value chain actors in improving income and livelihood performance. Therefore, the null hypothesis is rejected, and Hypothesis H3 is accepted.

Table 10 Individual variable Hypothesis Testing

Hypothesis	Variable	Expected Effect	Path coefficient (β)	P Values	Status
H1	Input Supply	*Positive (+)*	0.413	<0.001	Accepted
H2	Distribution & Transportation	*Positive (+)*	-.027	.593	Rejected
H3	Market Information	*Positive (+)*	-.016	.705	Rejected
H4	Value Chain Coordination	*Positive (+)*	0.728	<0.001	Accepted
H5	Financial Access	*Positive (+)*	-0.363	<0.001	Rejected *(Negative)*
H6	Milk Quality	*Positive (+)*	-.009	.822	Rejected
H7	Physical Infrastructure	*Positive (+)*	-.005	.929	Rejected

Source: (Own Survey, 2026)

4.5 Qualitative findings

Qualitative Analysis was conducted to estimate the effect of market linkages and value chain coordination on the livelihood performance of the dairy cooperative members in Debre Berhan. The qualitative findings support quantitative results by providing a deep insight into the stakeholder experiences. It clears up institutional and operational challenges within the dairy value chain.

Theme 1: Impact of cooperative Merging

The merger of the nine cooperatives to one entity emerged as the most significant development in the Debre Berhan dairy sector. This consolidation has basically changed power dynamics and market functioning.

- **Bargaining power and market influence**

  Before the merger, the individual traders dominated the price setting. Especially during the fasting periods, these traders disappeared. As the government officer noted, "*Before the merger, the trader was the one who had the power to set the price because the cooperative was weak... Now the cooperative takes the milk on its own and has the power to set the price with discussion.*" This change has created fairer market conditions.

- **Stable price and Market security**

  The consolidated cooperative has brought price stability, even during the fasting periods. The government officer explained "*Even during the fasting periods the price is the same. Before, traders would not collect milk during fasting and made the prices very low*." This stability represents a critical livelihood improvement for the farmers who previously faced market rejection during the fasting seasons.

- **Increased Operational Capacity**

  After the merger, the cooperatives have strengthened their capital and human skills. One of the participants from FGD said "*Now we have better skilled employees, enough capital, vehicles, cooling storage and processing for cheese and yoghurt*." This vertical integration has strengthened the cooperatives market position and delivery of the services.

Theme 2: Input Supply Systems and Infrastructure Gaps

- **Cooperative input distribution**

  The merged cooperatives have taken an active role in input supply, particularly animal feed. Participants in FGD reported that "*We provide animal feed at a lower price than the market to support members productivity."* This represents a strategic service that improves loyalty of the members and production capacity."

- **Milk Quality Standards**

Multiple quality control systems operated simultaneously. Government officers conduct inspections at five regional gates, while trades and processors implement their own testing methods. The processor mansions "*We check quality with alcohol and lactose tests. If milk lacks quality, we reject it immediately*."

Theme 3: Luck of Financial Access and Emerging solutions

Financial services remain a major problem, with systemic failures, emotional fears and innovative responses.

- **Institutional financial service failure**

  The formal financial sector shows significant gaps. The government officer mentions "*There are around 10 SACCOs, but they do not function properly. They have certificates and members but don't provide loans*." The institutional failure pushes stakeholders towards informal choices.

- **Farmers fear of loans**

  A critical insight emerged about why farmers be unwilling to use loans, even when they are available. A farmer explained that

  "*We are afraid to take loans because some farmers did, and they bought improved breeds. after some time, the breed died because of the inability to adapt to the weather. Then the loan could not be repaid. The farmers are at a loss, because these farmers have a big fear of not taking loans."*

  This shows that the problem is not just access but also risky and bad past experiences that make the farmers avoid debt.

- **Cooperative-Based Financial innovations**

  In response to formal sector gaps and the fear of farmers, the cooperative develops a safer internal financial mechanism. FGD participant outlined: *"We plan to provide loans to farmers and deduct payments from the milk income. We also offer animal insurance."* These innovations represent bottom-up solutions that address both financial access and risk security.

- **Payment security improvements**

  The value chain has been significant improvements in payment reliability. Contrasting last problems where the "traders would take milk for a month and disappear", current

systems improved "payment within 15 days" (individual traders). This payment risk solved and farmers building trust in formal transactions.

Theme 4: Value Chain Coordination Challenges and Conflicts

Even though the cooperatives become stronger, coordination problems still exist because of a deeper structural issue.

- **Territorial conflicts and Market Overlap**

  There is a constant conflict in the milk collection areas. The processor explains "There is interference in territories, some traders interfere during cooperative collection times." The individual traders similarly notes, "if there were defined territories, the traders would operate smoothly." Because there no clear structure problems that keep happening.

- **Corruption and Governance Challenges**

  Several stakeholders reports that there is corruption. The government officer identifies, "some board members allow individual traders to buy milk from the cooperative for personal gain, selling farmers milk at a lower price while taking money from traders." Such governance create trust issue and market in efficiency.

- **Seasonal Trader Problems**

  The value chain faces trouble from opportunistic actors. The processor described, "Seasonal traders offer high prices, then disappear during fasting periods, tricking farmers." This unpredictability will create instability and take advantage of the farmers.

- **Policy and regulatory Gaps**

  Stakeholders identified policy weaknesses. The government officer said, "we need specific dairy rules to control the marketing", while the processor includes, "strict licensing for milk traders only, not general food licenses." These regulatory Gaps allow the coordination problems to continue.

Theme 5: Trust Building and Institutional Development

Rebuilding trust and developing institutional resilience emerged as critical for a sustainable value chain integration.

- **Trust Gap**

  Past cooperative failures continue to affect current operations. A participant on FGD said, "some members sell half to the cooperative and half to traders because they don't fully

trust the cooperative due to past actions." This history of mistrust needs careful efforts to rebuild the trust.

- **Digitalization**

  The cooperative are using technological solutions to build trust. A participant on FGD said, "we propose digitalization, starting with systematic accounting to increase transparency and attract non-members." This is a forward step to improve the cooperative's credibility.

- **Market Structuring**

  Many stakeholders advice formalization seriously. The processor suggested "All milk should pass through cooperatives, with a defined work area for each trader." Similarly, the individual trader requested "policy protects traders and clear business territories" These actions would make market relationships more predictable.

- **Stakeholders Collaboration**

  Despite the conflicts, evidence of a collaboration exists. The government officer described regular meetings to regular conflicts, while the processor explains, "we have meetings where traders agree to buy from cooperatives." These platforms are important conflict resolution methods.

4.6 Discussion of Quantitative and Qualitative Findings

This research shows the effects of market integration on the livelihood performance of dairy cooperative members in D/Birhan. The regression model explains 66.3% of the variation in farmers' livelihood performance, indicating strong explanatory power. The qualitative findings were used to clarify why certain variables had stronger, weaker or insignificant effects.

Value Chain Coordination

Value chain coordination shows the strongest and most significant predictor of livelihood performance (β=0.714). Evidence from interviews indicates that the recent merger of dairy cooperatives has strengthened collective bargaining power. It reduces price fluctuations and protects farmers from seasonal traders especially during fasting seasons. Well-coordinated dairy value chains improve price stability, market access, and income security of smallholder farmers (Gebreyohanes et al. 2021).

Input Supply

Input supply Shows a significant and positive effect on livelihood performance (
(β=0.419). Findings from the interviews confirmed that cooperatives play a key role in creating reliable and affordable access to animal feed. These improve milk yield and farmers income. This production input is a critical determinant of productivity and household income (Gebreyohanes et al. 2021).

Financial Access

Financial access showed a significant but negative effect on livelihood performance(β=-0.356). The qualitative findings indicates that many farmers used credit to purchase exotic dairy breeds that were poorly adapted to the local environment resulting in financial losses.

(Goshme & Dadi, 2024) further emphasize that limited access to molecular and genomic technologies, combined with challenges in maintaining genetic diversity, increases the risk associated with cattle breeding, making households more vulnerable to financial shocks.

Weak SACCO performance and lack of insurance leads to financial risk. Studies indicates that poorly designed rural credit can increase farmer dependability and indebtedness rather than improve livelihoods (Tegegne, 2017). This supports the argument that access to finance alone does not guarantee positive performances without appropriate risk management.

Distribution and Transportation

Distribution and Transportation were not statistically significant. This insignificance is explained by the cooperative and processor milk collection system. Where transportation services are provided for all farmers, from collection centers to markets. Since all members receive the same transportation services it does not affect individual livelihood performances. Studies on dairy cooperatives report that centralized milk transport eliminated household level variation (Tegegne, 2017).

Physical infrastructure (Milk Collection centers and cold chain)

Physical infrastructure was also insignificant in the regression model. Qualitative evidence shows that milk collection centers and basic cold chain facilities are established and managed by

cooperatives and processors, not by individual farmers. All members can access it, meaning infrastructure affects performance at the cooperative level rather than at the household level. This explanation is consistent with findings by (Debele, 2012). who argue that collective infrastructure provision reduces individual level variation in performances.

Milk Quality Standardization

Milk Quality was not significant because quality compliance is a mandatory requirement. Alcohol and lactometer tests at all collection centers is a mandatory standards to all farmers. Since all farmers must meet minimum quality standards to sell milk, quality does not explain differences in livelihood performance. Similar conclusions were drawn in Ethiopian dairy studies where strict quality control system transformed quality from a competitive factor into a basic requirement (Tegegne et al., 2018).

Market Information

Market information was insignificant because farmers do not interact directly with final markets. Instead, cooperative collect, interpret, and communicate market information and process to members. This collective communication system ensures equal access to market information for all cooperative members. This eliminates individual level variation. Previous studies in Ethiopian confirm that cooperative mediated market information reduces information imbalances. It does not directly affect individual income differences (Debele, 2012).

Governance Factors

The remaining 33.7% of unexplained variation is largely attributed to governance related factors such as trust, leadership quality, and transparency. Interview revealed issues related to board accountability and seasonal trader behavior. The cooperative move toward digital accounting is an important step in improving governance and trust, consistent with evidence from Ethiopian cooperative governance studies (Tefera, 2008).

In general, the finding indicates that value chain coordination and input supply are key drivers of livelihood performance. Financial access can negatively affect farmers when credit is poorly managed. Variables such as market integration, infrastructure, transportation and milk quality are

insignificant because they are unimportant factors. They are successfully institutionalizing and uniformly provided by cooperatives and processors.

Chapter Five

Summary, conclusions and recommendations

5.1 Summary of findings

To identify the critical factors of livelihood performance among diary cooperatives members in Debre Birhan was the primary objective of this particular study. By assessing different analysts through mixed-methods approach, this research showed huge importance of Value-chain coordination and Input Supply. These elements appeared as the most important attributes to a farmer's success. Showing that 66.3% of the variance in household performance.

The research shows that the latest merger of primary cooperatives has incrementally changed the sector, shifting the bargaining power from traders to the farmers themselves. This process has regulated prices and secured market access, which are a must for the long-term improvement of income. Furthermore, the role of the cooperatives to provide affordable animal feed (Input Supply) has proven to be the leading factor of productivity.

On the other hand, this study showed a risky situation regarding financial access, which appears to be in a significant negative relationship with household performance. Primary evidence indicates that it was the lack of specialized knowledge and insurance for foreign breeds, leads to constant debt. Plus, the infrastructure and standards were found to be insignificant. This research suggests that they are already essential requirements in the area of the study rather than differentiating factors.

5.2 Conclusions

This study investigated how market integration through dairy cooperatives affects the livelihood performance of smallholder dairy farmers in Debre Birhan. The findings show that household livelihood success is primarily driven by value chain coordination and access to production inputs. The recent merger of cooperatives has strengthened collective bargaining power, reduced price fluctuations, and ensured stable market access, benefiting all cooperative members. Input supply, particularly affordable and reliable animal feed, significantly improved milk productivity and household income.

However, financial access in its current form was found to negatively affect livelihoods. Poorly designed credit, lack of insurance, and risky investments in exotic breeds exposed farmers to debt and financial losses. Other factors such as transportation, physical infrastructure, market information, and milk quality standards were not significant determinants of livelihood performance at the household level, as these services are uniformly provided through the cooperative.

Overall, the study highlights that smallholder dairy farmers in Debre Birhan are directly affected by the effectiveness of cooperative governance, trust, and coordinated market actions. To improve livelihoods, it is essential to strengthen cooperative-led value chain coordination, ensure reliable input provision, implement dairy-specific financial services with risk protection, and foster transparent leadership and member trust. These actions will help stabilize income, reduce vulnerability, and promote sustainable growth in the local dairy sector.

5.3 Recommendations

Based on the findings the following recommendations are made.

- **Strengthening of the Value Chain governance and Digitalization**: Since coordination is the primary driver of success, the cooperatives should adopt digital recording, payment and milk tracing systems.
- **Restructuring financial services:** Instead of providing generic loan products, SACCOs should design and **deliver dairy-specific financial services** that reflect the unique risks and production cycles of the dairy business. These financial packages should include credit linked with animal insurance, veterinary and extension services, and technical training. By aligning loan repayment schedules with milk production and integrating risk-management mechanisms, SACCOs can prevent farmers from falling into unsustainable debt, particularly in cases of exotic breed mortality. Tailoring financial services to the dairy value chain will improve credit effectiveness, repayment performance, and overall livelihood stability of dairy cooperative members.
- **Merging of SACCOs:** The study found that there are ten saving and credit cooperative organizations (SACCOs) in the area. Most are non-functional and fails to provide real

credit to the farmers. It is advised that the government and regional cooperative bureau facilitate a merger of the non-functional SACCOs to one or two centralized entities. Just as the dairy cooperatives gained power by merging, merging the SACCOs would allow for better capital pooling, professional management and the ability to provide package deals to the farmers.

- **Expanding localized cooling infrastructure**: by getting donations of small-scale cooling centers from NGOs and Governments. It would reduce transportation cost of milk and decrease spoilage to significantly increase farmer profits.
- **Formalizing Trader cooperative partnerships:** Policies that create a clear framework where private sectors and cooperatives work together, instead of competing against each other. Making special collection territories and license dedicated dairy traders will create a more stable and peaceful market.
- **Establishing a Cooperative Breeding and Multiplication Center:** To address the high death rates of exotic breeds, it is recommended that the unified cooperative establishes its own animal breeding farm and research station. Once these animals adapt to the local environment and climate of region, the cooperative can then sell them to the members on a loan-repayment basis (deducted from milk income). This model ensures that farmers receive healthy, weather-tested animals along with the necessary technical training, significantly reducing the financial risk to the household.
- **Establishment of a Cooperative-Owned Modern Farm:** The merged cooperative should establish its own modern, commercial-scale dairy farm to focus on the industrialization of the region. By managing its high-tech facility featuring zero-grazing and automated systems the cooperative can ensure a consistent milk supply and act as a show and tell, for its members. This allows the cooperative to test and help improved breeds in a managed environment before selling them to farmers.

5.4 Further research

While this study shows a clear picture of the diary sector in the region of Debre Berhan.
Comparative studies between Ethiopian dairy value-chain with successful models like Kenya, India, and the Netherlands. Kenya holds regional benchmark for smallholder cooperative operations. While India provides lessons on scaling production. Diving into the Dutch model could offer lessons in High tech breed management and quality control. Comparing these nations with Ethiopia would help to find the best road map for national diary development.

Appendix 1: Quantitative research questionnaire

Quantitative research questionnaire

Addis Ababa University College of Business and Economics

Department of Business Administration

Research Title:

"Market Chain Integration and Livelihood Performance among Dairy Cooperative Members in Debre Birhan, Ethiopia"

Dear Respondent,

My name is **Beza Tadesse**, and I am conducting this research as part of my master's thesis in Business Administration at Addis Ababa University. The study aims to examine how market integration and value chain efficiency influence the livelihood performances of smallholder dairy farmers in Debre Birhan.

Your responses will be used solely for academic purposes and treated with strict confidentiality. Please answer honestly based on your own experience. You do not need to write your name anywhere on this questionnaire.

Phone No.: 0911-120589

Email: beza.tadesseb@gmail.com

Please note: **You do not need to write your name anywhere on this questionnaire.**

Thank you very much for your time and valuable participation.

Sincerely,

Beza Tadesse

Study title: Market Chain Integration and Livelihood Performances among Dairy Cooperative Members in Debre Birhan, Ethiopia.

Name: _____ Date: _____ Kebele: _____ Respondent ID: _____

Hello. I am conducting a study about Market chain integration and farmers' Performance. Your participation is voluntary. The interview will take about 25–40 minutes. Your answers will be anonymous and used only for research. You may stop at any time.
Do you agree to participate?

☐ Yes ☐ No

Section A — Household & Farm background (controls)
(These items are needed to control in analysis; keep short.)

1. Respondent sex: ☐Male ☐Female

2. Age: Below 30 Years☐ 31 to 39 years☐ 39 to 49 years ☐ Above 50 years ☐

3. Highest education level completed:

☐ No formal ☐ Primary ☐ Secondary ☐ TVET/College ☐ University +

4. Household size (number of people living/working on farm): _____
5. Years of experience in dairy farming:

Below 2 years☐2 to 5 years ☐ 6 to 10 years ☐ 1 to 15 years☐16 to 20 years ☐Above 20 Years

☐

7. Herd size (number of milking cows): _____

8. Herd composition: ☐ Local ☐ Crossbred ☐ Both (specify %) _____

9. Main other income sources (tick all that apply): ☐ Crop sales ☐ Off-farm wage ☐ Remittances

☐ Other: _____

Section B —Livelihood Performances (Dependent Variable)

1. Average milk sold per day (liters): _____ liters
2. Average monthly income from milk sales (ETB): _____
3. In the past 12 months, my household's income from dairy has: ☐ Decreased ☐ Stayed the same ☐ Increased slightly ☐ Increased moderately ☐ Increased greatly
4. Frequency: How many days per week do you deliver milk to the cooperative? _____ days/week
5. Distance from farm to nearest market/collection center (km): _____ km

Instructions: Dear respondents, depending on your experience please rate and tick [√] in the appropriate box for your answers and rank each statement as follows:
5 = strongly agree (SA), 4= Agree (A), 3 = Neutral/ not sure (N), 2 = Disagree (D) , 1= strongly disagree (SD)

Household performance (dependent variable)

No	Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	NA
1	Household income from dairy activities increased over the past year.	1	2	3	4	5	NA
2	Dairy farming has improved my family's living conditions	1	2	3	4	5	NA
3	I can cover household expenses mainly from dairy income.	1	2	3	4	5	NA
4	After I joined the cooperative, my cash savings have increased.	1	2	3	4	5	NA
5	Dairy income contributes significantly to household food security.	1	2	3	4	5	NA
6	Dairy activities have improved my household's ability to pay for health services.	1	2	3	4	5	NA
7	Dairy income has improved children's school attendance in my household.	1	2	3	4	5	NA
8	I have been able to invest dairy earnings into productive assets.	1	2	3	4	5	NA
9	Dairy income provides stable cash flows across seasons.	1	2	3	4	5	NA
10	Dairy income reduces my household's vulnerability to shocks.	1	2	3	4	5	NA
11	I am satisfied with the contribution of dairy to my household welfare.	1	2	3	4	5	NA
12	Overall, dairy activities have positively impacted my household livelihood.	1	2	3	4	5	NA

(Items adapted from Tegegne, 2017)

Input Supply

No	Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	NA
1	The required inputs (e.g., feed) are consistently available when needed.	1	2	3	4	5	NA
2	The quality of the supplied input meets our standards.	1	2	3	4	5	NA
3	The delivery times for input are predictable.	1	2	3	4	5	NA
4	The availability of input supplies meets our production demand consistently.	1	2	3	4	5	NA
5	Input supplies are delivered on time without frequent delays.	1	2	3	4	5	NA
6	The quality of input supplies from our suppliers is reliable and meets specifications.	1	2	3	4	5	NA
7	The cost of input supplies is competitive and predictable.	1	2	3	4	5	NA
8	Our suppliers maintain adequate stock levels to avoid shortages.	1	2	3	4	5	NA
9	Communication with suppliers regarding input supply issues is effective and prompt.	1	2	3	4	5	NA
10	Overall, our input supply chain supports business growth efficiently.	1	2	3	4	5	NA

(Items adapted from Tegegne, 2017)

Distribution and Transportation

No	Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	NA
1	Milk transportation from farms to collection centers is efficient and timely.	1	2	3	4	5	NA
2	The vehicles used for milk transport maintain hygienic conditions.	1	2	3	4	5	NA
3	Milk is rarely spoiled during transportation.	1	2	3	4	5	NA
4	Transportation delays rarely affect milk delivery to buyers.	1	2	3	4	5	NA
5	There are adequate milk collection centers within reasonable distance.	1	2	3	4	5	NA
6	Road networks connecting farms to markets are well maintained.	1	2	3	4	5	NA
7	Milk is transported under proper temperature control.	1	2	3	4	5	NA
8	The cost of transportation is reasonable compared to milk prices.	1	2	3	4	5	NA
9	Reliable transportation systems help prevent milk losses.	1	2	3	4	5	NA
10	Overall, the distribution and transportation system supports efficient milk marketing.	1	2	3	4	5	NA

(Items adapted from Tegegne, 2017)

Milk quality Standardization

No	Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	NA
1	Milk is routinely tested for quality at collection points.	1	2	3	4	5	NA
2	There is a clear, commonly understood standard of acceptable milk quality.	1	2	3	4	5	NA
3	Our milk that we provide to the market consistently meet customer expectations for quality.	1	2	3	4	5	NA
4	The quality of the milk is reliable and consistent over time.	1	2	3	4	5	NA
5	The milk is free from defects.	1	2	3	4	5	NA
6	Payment is adjusted based on measured milk quality.	1	2	3	4	5	NA
7	The cooperative prioritizes high-quality standards in its processes.	1	2	3	4	5	NA
8	Customer support related to the milk quality is prompt and effective.	1	2	3	4	5	NA
9	The milk meets or exceeds industry quality standards.	1	2	3	4	5	NA
10	I am satisfied with the overall quality of the milk that I supply to the market.	1	2	3	4	5	NA
11	Chillers or cooling are used to preserve milk quality before sale.	1	2	3	4	5	NA
12	Quality control procedures are enforced consistently.	1	2	3	4	5	NA
13	Poor-quality milk is rejected or downgraded by buyers.	1	2	3	4	5	NA
14	Overall, milk quality standardization has improved in recent years.	1	2	3	4	5	NA

(Items adapted from Abebe et al., 2013)

Financial access

	Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	NA
1	I have easy access to affordable banking services to take credit.	1	2	3	4	5	NA
2	Obtaining a loan or credit is easy for me once I joined the cooperative.	1	2	3	4	5	NA
3	Financial institutions in my area provide services that meet my needs.	1	2	3	4	5	NA
4	I feel confident in my ability to access financial advice or support when needed.	1	2	3	4	5	NA
5	The costs associated with financial services (e.g., fees, interest rates) are reasonable.	1	2	3	4	5	NA
6	The process to apply for credit is clear and simple.	1	2	3	4	5	NA
7	I am aware of and can easily access financial products tailored to my income level.	1	2	3	4	5	NA
8	Financial services are equally accessible to all members of my cooperative, regardless of income or background.	1	2	3	4	5	NA
9	I have experience of taking a loan from financial institutions for my work.	1	2	3	4	5	NA
10	Overall, financial services meet the needs of my dairy business.	1	2	3	4	5	NA

(Items adapted from Chopra & Meindl, 2016)

Physical infrastructure

No	Statement	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	NA
1	Roads between farms and collection points are in good condition.	1	2	3	4	5	NA
2	The distance to the nearest cold storage is acceptable for preserving milk.	1	2	3	4	5	NA
3	Electricity supply is reliable for operating chilling and processing equipment.	1	2	3	4	5	NA
4	There are sufficient collection centers or cooling facilities in my area	1	2	3	4	5	NA
5	Market infrastructure (roads, loading areas) supports timely transport of milk.	1	2	3	4	5	NA
6	Lack of physical infrastructure causes post-harvest losses. *(reverse scoring)*	1	2	3	4	5	NA
7	Investment in infrastructure would significantly reduce milk spoilage.	1	2	3	4	5	NA
8	Transport and storage infrastructure are well-maintained and available.	1	2	3	4	5	
9	Public or private investment has improved dairy infrastructure recently.	1	2	3	4	5	
10	Overall, physical infrastructure enables efficient milk marketing.	1	2	3	4	5	

(Items adapted from Chopra & Meindl, 2016)

Market Information

No	Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	NA
1	I receive timely information about milk market prices.	1	2	3	4	5	NA
2	I know who the main buyers of milk are in my area.	1	2	3	4	5	NA
3	I get updates on market demand and supply for dairy products.	1	2	3	4	5	NA
4	Market information helps me decide when to sell milk.	1	2	3	4	5	NA
5	I use cooperative meetings or bulletin boards to access market updates.	1	2	3	4	5	NA
6	I have access to mobile or radio-based dairy price information.	1	2	3	4	5	NA
7	The market information I receive is reliable and accurate.	1	2	3	4	5	NA
8	There is transparency in milk pricing between producers and buyers.	1	2	3	4	5	NA
9	I get information about quality standards and buyer requirements.	1	2	3	4	5	NA
10	Overall, I am satisfied with the availability of dairy market information.	1	2	3	4	5	NA

(Items adapted from Abebe et al., 2013)

Value Chain Coordination

No	Statement	StronglyDisagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	NA
1	Coordination mechanisms (e.g., meetings, shared systems) effectively support value chain operations.	1	2	3	4	5	NA
2	There is effective communication between producers, collectors and processors.						NA
3	Communication between stakeholders in the value chain is clear and timely.	1	2	3	4	5	NA
4	All partners in the value chain collaborate effectively to achieve common goals.	1	2	3	4	5	NA
5	Information sharing (e.g., demand forecasts, inventory levels) across the value chain is efficient.	1	2	3	4	5	NA
6	Roles and responsibilities of each partner in the value chain are clearly defined	1	2	3	4	5	NA
7	The value chain operates smoothly with minimal delays or disruptions.	1	2	3	4	5	NA
8	There is strong trust and mutual understanding among value chain partners.	1	2	3	4	5	NA
9	The value chain is responsive to changes in market demand or external challenges.	1	2	3	4	5	NA
10	Conflict resolution mechanisms exist for disagreements among actors.	1	2	3	4	5	NA
11	Regular coordination meetings are held between producers and buyers.	1	2	3	4	5	
12	The cooperative or lead firm facilitates linkages between smallholders and processors	1	2	3	4	5	

(Items adapted from Chopra & Meindl, 2016)

Section H — Short Open Questions (qualitative complement — optional)

1. What is the main challenge you face when selling milk?

_____

_____

_____

2. What improvement would most help you increase your dairy income?

_____

_____

_____

Appendix 2: Qualitative research guide

A. Key Informant Interview (KII) Guide — Government Offices

Introduction

Dear Participant,

My name is **Beza Tadesse**, and I am conducting a master's research on "Market Chain Integration and Livelihood Performances among Dairy Cooperative Members in Debre Birhan, Ethiopia"

The purpose of this interview is to gain insights from experts about the status, challenges, and opportunities related to market chain integration and livelihood performance among dairy cooperatives in Debre Birhan.

Your responses will be kept confidential and used only for academic purposes. This interview will take approximately 30–45 minutes.

Interview Questions

1. Institutional Role and Overview

- Can you describe your office's role in supporting dairy value chain development and cooperative market integration in this zone/region?
- How many dairy cooperatives are currently engaged in milk marketing and value addition in your jurisdiction?

2. Market Integration and Value Chain Coordination

- How well are dairy cooperatives linked with processors, traders, and other market actors?
- What mechanisms (contracts, coordination meetings, joint planning) exist to strengthen coordination along the dairy value chain?
- What are the major challenges to achieving smooth market integration among actors?

3. Financial Access and Support Services

- What financial services or credit facilities are available for dairy cooperatives and their members?

- How do cooperatives access working capital for milk collection, processing, or transportation?
- What are the main barriers to improving financial access for cooperatives and farmers?

4. Infrastructure and Milk Quality

- How adequate are physical infrastructures such as roads, electricity, and cold chain systems for milk transportation and storage?
- What is being done to improve milk quality standardization and safety along the chain?
- How do these factors affect market participation and income for farmers?

5. Value Chain Efficiency and Livelihood Performances

- In your view, how efficient is the overall dairy value chain in Debre Birhan (in terms of coordination, cost, and timely delivery)?
- How has improved efficiency affected farmers' livelihoods and income generation?

6. Policy, Investment, and Data

- What policy measures or investments are most urgently needed to strengthen dairy market integration and value chain efficiency?
- Does your office collect and monitor data on cooperative market performance and farmers' income? If yes, how is it used?

7. Final Comments

- What advice would you give to policymakers or development partners to enhance market chain integration and improve the livelihoods of dairy farmers?

B. Key Informant Interview (KII) Guide – Milk Processors

Introduction

This interview seeks your insights about milk procurement relationships with dairy cooperatives, value chain coordination, and challenges affecting market efficiency.

Interview Questions

1. Please describe your processing operations and current milk procurement sources (cooperatives, traders, or individual farmers).
2. How would you describe your coordination with dairy cooperatives (e.g., contracts, communication, pricing, delivery schedules)?
3. What are the main challenges you face when sourcing milk from cooperatives? (quality, consistency, logistics, delayed supply)
4. Do you provide incentives or premiums for high-quality or timely delivered milk? How are these determined?
5. How do physical infrastructure (roads, cold storage) and electricity supply affect your operations and procurement efficiency?
6. What improvements in coordination or financing would help strengthen your linkages with cooperatives?
7. In your view, how can better market integration improve efficiency and benefit both processors and farmers?
8. What policy or institutional support would you recommend to improve the dairy value chain?

C. Key Informant Interview (KII) Guide – Traders/Collectors

Introduction

This interview aims to understand the role of milk traders/collectors in market integration, their linkages with cooperatives, and challenges affecting value chain performance.

Interview Questions

1. Please describe your role in the milk marketing chain (collection, transport, sales).
2. From whom do you mainly collect milk — individual farmers or cooperatives? Why?
3. How do you coordinate with cooperatives and processors to ensure smooth milk flow?
4. How do you determine prices and handle payments? (cash/credit, delays, bargaining)
5. What challenges affect your ability to deliver milk efficiently (infrastructure, storage, quality control)?
6. How do you ensure milk quality during collection and transport?
7. What kind of financial or logistical support would help improve your business efficiency?
8. What are your recommendations for improving coordination and reducing transaction costs along the dairy value chain?

D. Focus Group Discussion (FGD) Guide – Cooperative Members

Introduction

Thank you for joining this group discussion. The purpose is to collect members' views on market chain integration, financial access, infrastructure, milk quality, and their effects on livelihood performance.

Your participation is voluntary, and your information will be kept confidential.

Discussion Questions

1. **Market Integration:** How easily can you sell milk through your cooperative or other market channels?
2. **Coordination:** How well does your cooperative coordinate with processors, traders, and other buyers?
3. **Financial Access:** Does you or your cooperative have access to credit or financial services to support milk production or marketing?
4. **Infrastructure:** How do roads, storage, and electricity conditions affect milk collection and delivery?
5. **Milk Quality:** What practices are followed to maintain milk quality and hygiene before sale?
6. **Efficiency:** Do you think the current system allows for timely and cost-effective milk marketing?
7. **Livelihood Impact:** How has participation in the dairy market improved your household income or wellbeing?
8. **Challenges:** What are the main constraints you face in milk marketing and cooperative participation?
9. **Recommendations:** What should government, NGOs, or cooperatives improve to strengthen dairy market integration?
10. **Closing:** What final message would you like to share with cooperative leaders, policymakers, or processors?

E. Ethical Considerations for All Interviews/FGDs

- Participation is **voluntary**. Respondents may skip any question or stop at any time.
- **Confidentiality**: No names will be recorded in the final report.
- **Informed consent**: Before each interview or discussion, participants will be informed about the purpose, duration, and use of the data and asked for verbal consent to participate and to be recorded.

Appendix 3: NVivo coding statistics table

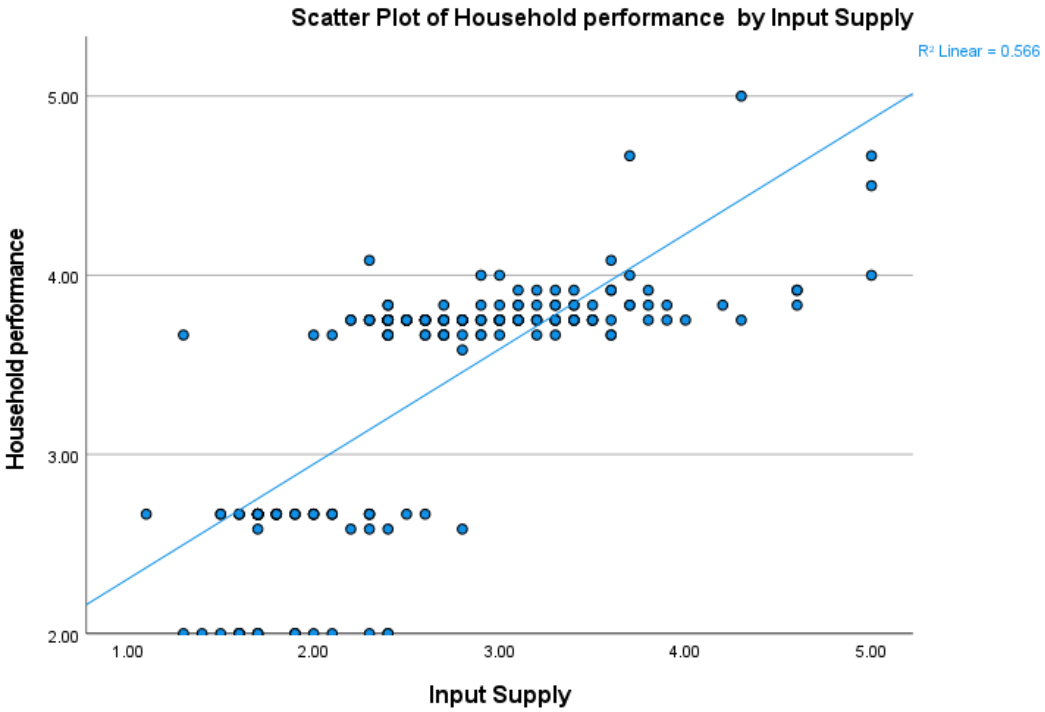
QUALITATIVE DATA SOURCES
├── Key Informant Interviews (3)
│ ├── Government Officer
│ ├── Individual Trader
│ └── Dairy Processor
└── Focus Group Discussions (1)
└── Cooperative Board Members (5 participants)

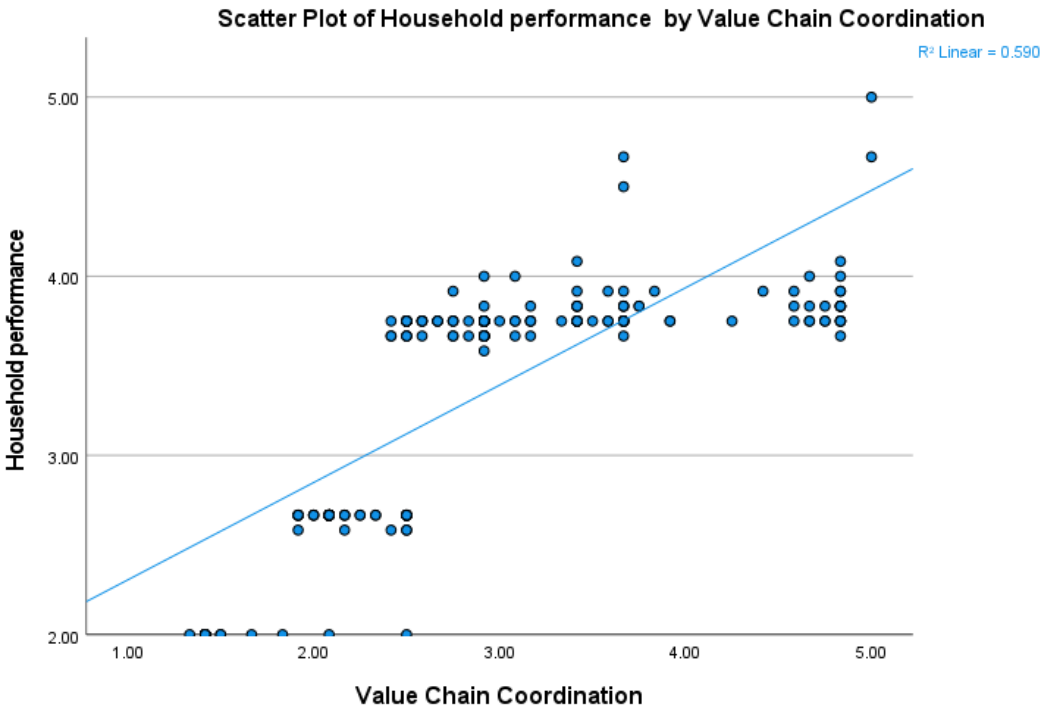
Theme	Sub-Theme	Source References	Participant Mentions	Key Stakeholders
1. Cooperative Merging	1.1 Bargaining Power	5	8	GO, FGD
	1.2 Price Stabilization	3	6	GO, FGD
	1.3 Operational Capacity	2	5	FGD

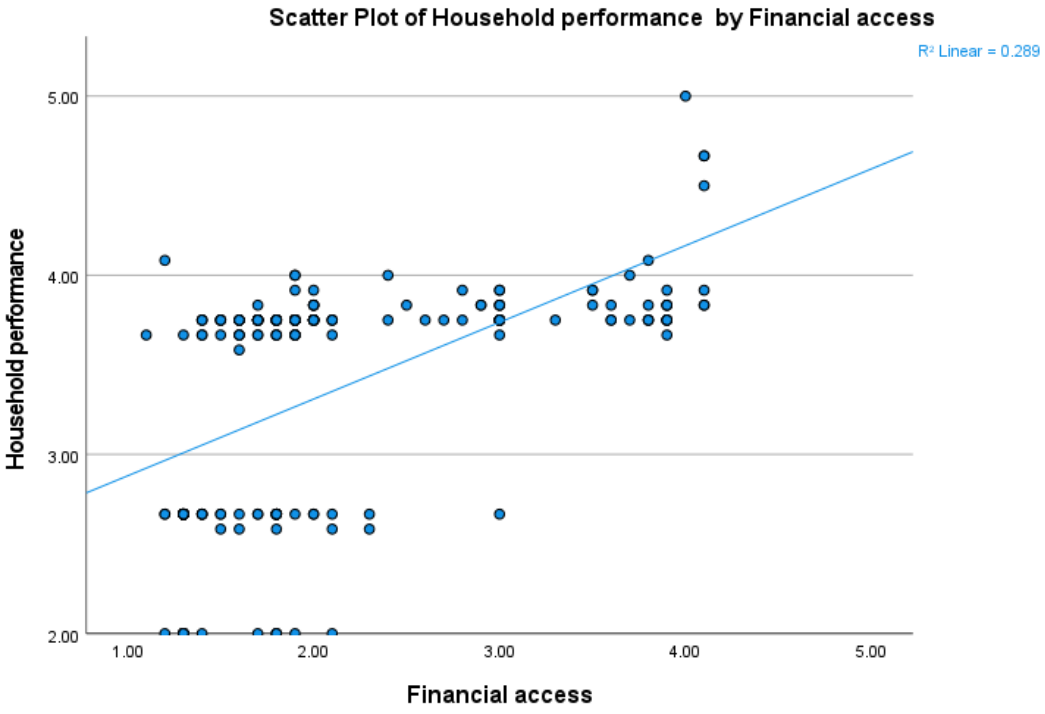
Theme	Sub-Theme	Source References	Participant Mentions	Key Stakeholders
2. Input & Infrastructure	2.1 Cooperative Input	1	5	FGD
	2.2 Infrastructure Gaps	2	4	IT, P
	2.3 Quality Assurance	2	3	P, GO
3. Financial Access	3.1 SACCO Failure	1	3	GO
	3.2 Fear of Loans	1	5	FGD
	3.3 Cooperative Innovations	1	4	FGD
	3.4 Payment Security	1	2	IT
4. Coordination Challenges	4.1 Territorial Conflicts	2	4	P, IT
	4.2 Corruption	1	3	GO
	4.3 Seasonal Traders	1	2	P
	4.4 Policy Gaps	2	4	GO, P
5. Trust Building	5.1 Trust Deficits	1	3	FGD
	5.2 Digitalization	1	2	FGD

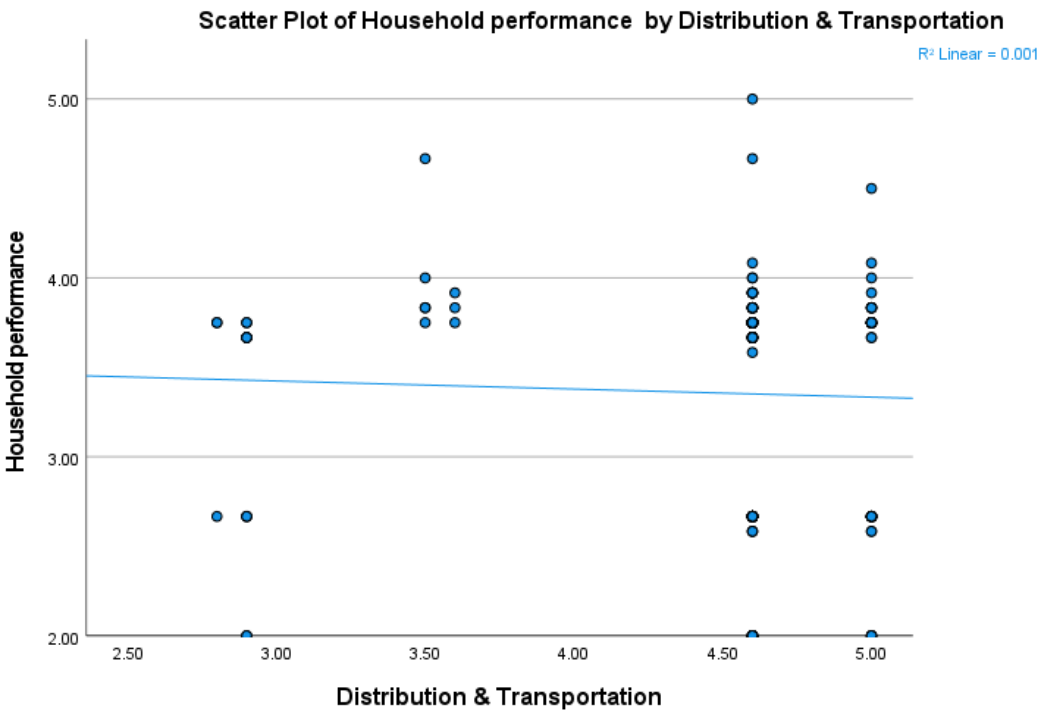
Theme	Sub-Theme	Source References	Participant Mentions	Key Stakeholders
	5.3 Formalization	2	2	P, IT
	5.4 Collaboration	2	2	P, GO

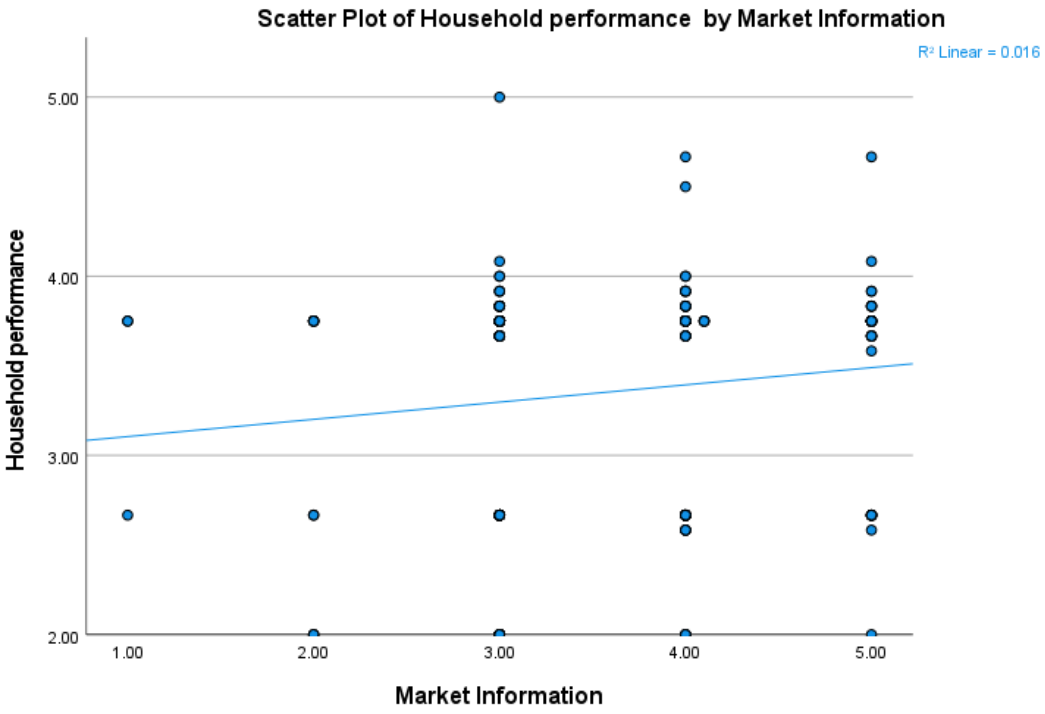
Appendix 4: Linearity test for nonlinear variables

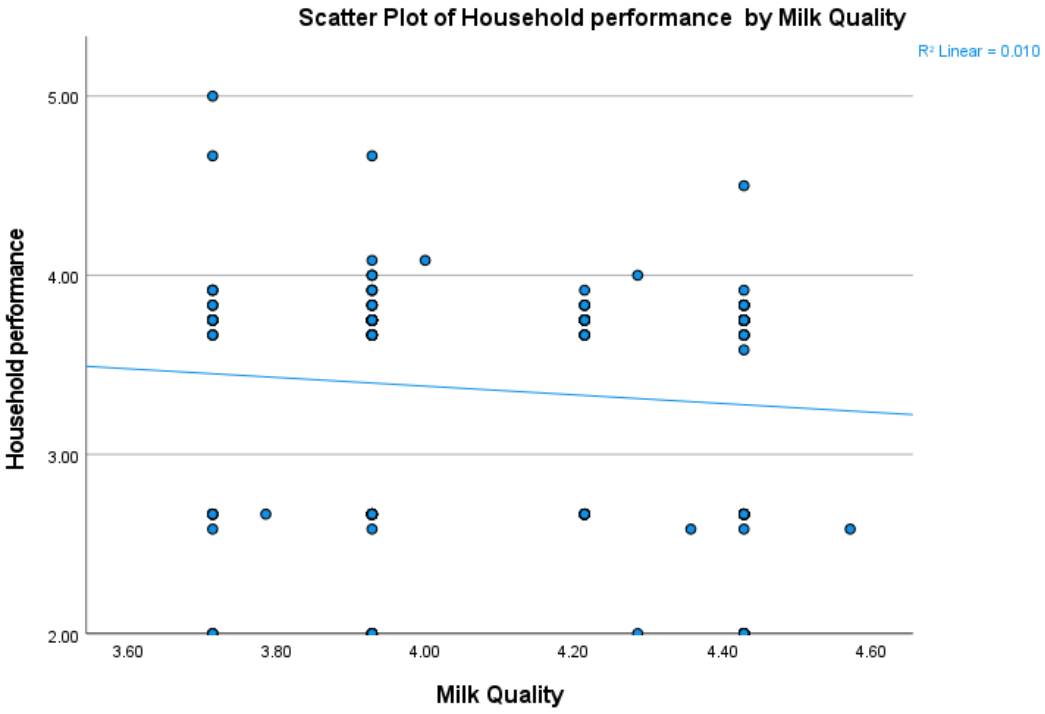


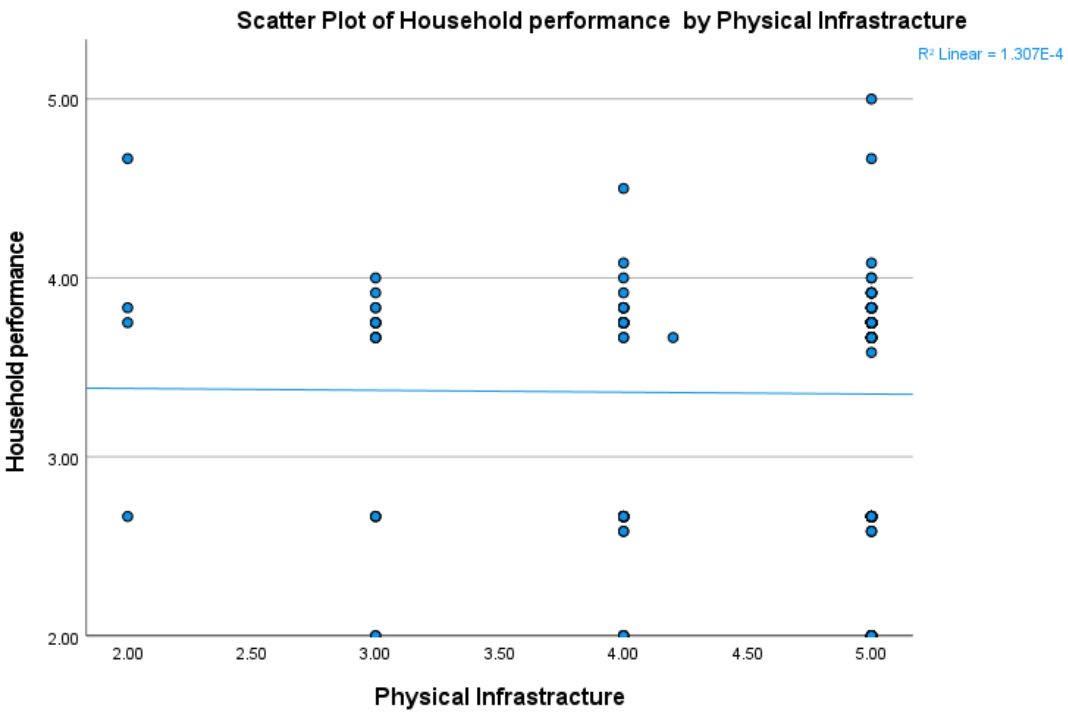

Scatter Plot of Household performance by Value Chain Coordination
R² Linear = 0.590
Household performance
5.00
4.00
3.00
2.00
1.00
2.00
3.00
4.00
5.00
Value Chain Coordination


Scatter Plot of Household performance by Financial access
R² Linear = 0.289
Household performance
5.00
4.00
3.00
2.00
1.00
2.00
3.00
4.00
5.00
Financial access


Scatter Plot of Household performance by Distribution & Transportation
R² Linear = 0.001
Household performance
5.00
4.00
3.00
2.00
2.50
3.00
3.50
4.00
4.50
5.00
Distribution & Transportation


Scatter Plot of Household performance by Market Information
R² Linear = 0.016
Household performance
5.00
4.00
3.00
2.00
1.00
2.00
3.00
4.00
5.00
Market Information


Scatter Plot of Household performance by Milk Quality
R² Linear = 0.010
Household performance
5.00
4.00
3.00
2.00
3.60
3.80
4.00
4.20
4.40
4.60
Milk Quality


Scatter Plot of Household performance by Physical Infrastracture
R² Linear = 1.307E-4
Household performance
5.00
4.00
3.00
2.00
2.00
2.50
3.00
3.50
4.00
4.50
5.00
Physical Infrastracture

Lists of photos

Photo 1: Cold chain vehicle



Photo 2: Milk collection center







Photo 3: Questionary with individual farmers



Photo 4: Animal feed



Photo 5: Milk at processor



Photo 6: Confirmation Letter of FGD Conducted at D/Birhan Cooperative



ደ/ብርሃን ወተት ልማትና ግብይት ኃላ.የተ. ህብረት ስራ ማህበር
Debre Birhan Dairy Marketing & Development cooperative

ቁጥር-ደ/ብ/ወ/ል/ግ/ህ/ኪ/ማ/-624/2018

ቀን 08/03/2018 ዓ.ም

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አዲስ አበባ

ጉዳዩ፡-መረጃ መስጠትን ይመለከታል ::

ከላይ በርዕሱ ለመግለፅ እንደተሞከረዉ ተማሪ ቤዛ ታደሰ በአዲስ አበባ ዩንቨርስቲ እየተማረች መሆኑንና በደብረብርሀን አካባቢ የወተት ግብይት ላይ በማርኬት ኢንተግሬሽን /Market integration/ ላይ ሪሰረች አሰራች መሆኑን ገልፃልን መረጃ እንድንሰጣት ከቀን ህዳር 2-4/2018 በአካል በመገኘት በጠየቀችው መሰረት የፅሁፍ መረጃዎችን ቃለመጠይቆችን፣እና የቡድን ውይይቶችን ከማህበሩ የስራአመራር፣ ቅጥር ሰራተኞችና የወተት አምራች አባል አርሶ አደሮችን በማወያየት መረጃ የወሰደች መሆኑንና የሰጠናት መረጃም ትክክለኛ ለመሆኑ ይህን ደብዳቤ የሰጠናት መሆኑን ለመግለፅ እንወዳለን

"ከሰላምታ ጋር"

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