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Analysis of Farmer's Perception and Constraints on Dairy Cooperatives in Amhara Region, Ethiopia

Abateneh Molla[1], Azanaw Abebe[2], Mulugeta Balew[1], Desyalew Assefa[3], Senait Kehali[4]*
1) College of Agriculture, Woldia University, P.O.Box 400, Woldia, Ethiopia
2) College of Agriculture and Environmental Sciences, Bahir Dar University, P.O.Box 5501, Bahir Dar, Ethiopia
3) College of Agriculture and Natural Resource, Debre Markos University, P.O.Box 269, Debre Markos, Ethiopia
4) College of Agriculture and Natural Resource, Mekdela Amba University, P.O.Box 32, Tuluawuliya, Ethiopia
**) Corresponding Author: abate0918@gmail.com*

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***Abstract*—This study was done to examine the farmer's perception and constraints on dairy cooperatives in Amhara region, Ethiopia. A sample of 266 smallholder dairy farmers was selected using a multi-stage sampling technique. Perception of farmers was analyzed using relative importance index, and constraints of dairy cooperative performance were analyzed using Henry Garrett's ranking technique. The result indicates that farmers have a positive perception of certain attributes of dairy cooperatives; such as increasing social networks, improving income, and serving as a saving source. This suggests that farmers believe these aspects of dairy cooperatives are beneficial. Conversely, farmers have concerns and dissatisfaction with the way the cooperative is running, the loyalty of members to the cooperative, member's treatment by cooperatives, and the decision-making process. The study also identified that lack of milk processing facilities, poor member awareness, and member involvement in the decision-making process are the foremost internal challenges of dairy cooperatives, while high cost of cross-breed cows, occurrence of animal disease, and low productivity of local breed cows are external constraints hindering dairy cooperative performance. Thus, to enhance farmers' perception and participation in cooperative activities, emphasis should be given to addressing concerns and improving the overall functioning of dairy cooperatives.**

Keywords*— Constraint, dairy cooperative, Ethiopia, perception, relative importance index

I. INTRODUCTION

Between 1990 and 2015, all developing regions worldwide, except Africa, successfully achieved the Millennium Development Goal of reducing poverty [1]. Given that a significant portion of Africa's impoverished population relies heavily on agriculture for their livelihoods [2], improving the efficiency, benefits, and sustainability of the rural sector is considered the primary means of alleviating poverty on the continent [3, 4, 5]. Agriculture plays a crucial role for all countries in meeting food requirements and enhancing the quality and productivity of crops and livestock [6, 7].

However, the agricultural sector faces several challenges, including low productivity, lack of capital, inadequate support, poor organization, shortage of farmers, and limited competitiveness with other sectors [8, 9]. Despite these obstacles, the agricultural sector's growth in Africa has been slow [10]. Particularly in Sub-Saharan Africa (SSA), including Ethiopia, agricultural productivity remains stagnant [11]. In such circumstances, cooperatives play a crucial role in providing essential support services to overcome these challenges and drive transformation in the agricultural sector [12].

Cooperatives are considered a suitable tool for rural development in Ethiopia [13]. Consequently, the government of Ethiopia places significant emphasis on promoting cooperatives as a primary means to enhance farmers' access to inputs, credit, and output markets, as well as to improve coordination within the smallholder sector [14]. This focus has led to a notable increase in the number of cooperatives and overall membership over the past decade. According to the report of the International Cooperative Alliance [15], Ethiopia currently has over 92,755 primary cooperatives and 131 unions, with a total membership of 21,043,370. However, these figures remain relatively low compared to the country's potential and the size of its population.

Despite the potential benefits, cooperatives in Ethiopia face various challenges that impede their ability to achieve their intended goals. These challenges include resistant attitudes, a lack of dedicated leadership, inadequate governance, insufficient working capital, prevalent attitudes and practices of corruption, limited knowledge and skills, inadequate provision and utilization of improved technology, weak connections and collaboration within and between cooperatives, and inadequate support from the government and other stakeholders [16]. These problems serve as barriers to the effective functioning and impact of cooperatives in Ethiopia.

Moreover, the Theory of Planned Behavior, proposed by Ajzen [17, 18], suggests that attitudes, subjective norms, and perceived behavioral controls influence individuals' intentions, which subsequently shape their behaviors and decision-making,

particularly in specific situations. In the context of agricultural cooperatives, members' attitudes towards the governance system can play a significant role in influencing their actions and level of involvement [19]. Furthermore, from a behavioral perspective, attitudes are recognized as one type of factor of behavior [18]. Several studies have explored farmers' perceptions of cooperatives in various regions worldwide. For instance, research conducted by Harishree [20], Mishra [21], and Sevinç [22] has revealed that a majority of farmers hold positive attitudes regarding the significant role played by cooperatives. However, there is a lack of extensive research on farmers' perceptions specifically towards dairy cooperatives in the Ethiopian context, which prompted the initiation of the current study.

II. Research Methodology

A. Description of the Study Area

The study was conducted in Amhara Region (Machakel District), which is recognized as one of the primary dairy-producing areas in the country. The district geographical coordinate ranges from 10º 19' 75'' to 10º 41' 00'' N latitude and 37º 16' 46'' to 37º 45' 42'' E longitude [23]. It is located approximately 330 km northwest of Addis Ababa, the capital city of Ethiopia, and 237 km south of Bahir Dar, the capital city of the Amhara Regional State. Machakel District comprises 25 rural and 2 urban kebeles, with Amanuel serving as the administrative town. The total area of the district is approximately 79,556 hectares, with elevations ranging from 1200 to 3200 meters above sea level (m.a.s.l). The district has an estimated population of 145,219 individuals.

Agriculture serves as the primary source of livelihood in Machakel District. The district's agroecology is conducive to diverse agricultural production. Both crop cultivation and livestock rearing contribute significantly to the income and sustenance of the local population. The main crops cultivated in the area include wheat, maize, teff, and barley. Livestock plays a vital role in the local production system, with cattle, sheep, goats, horses, donkeys, mules, poultry, and honey bees (apiculture) being commonly practiced. While there is some market-oriented production, the majority of livestock production is for subsistence purposes. According to the annual report of the Animal Production and Fishery Development Office of the District, there are a total of 35,022 dairy cows in the area. Among them, 1,591 are crossbreed cows, while the remaining 33,431 cows are local breeds. The district is witnessing rapid growth in smallholder dairy production, with a strong emphasis on milk production and marketing cooperatives, along with a smaller number of privately owned dairy farms.

B. Sampling Design and Sample Sources

The study was conducted using cross-sectional data collected from 266 dairy farmers who were members and non-members of two dairy production and marketing cooperatives in Machakel District. The data collection took place from January 2021 to March 2021. The sample households were selected using a multi-stage sampling technique.

In the first stage, two dairy production and marketing cooperatives, Embuli and Yewobesh, were randomly selected. In the second stage, a stratified sampling method was employed due to the heterogeneity of the population in terms of dairy cooperative membership. Dairy farmers in the kebeles (local administrative units) where the dairy cooperatives were located were divided into two strata: cooperative member dairy farmers and non-member dairy farmers. Finally, a total of 266 dairy farmers, consisting of 123 cooperative members and 143 non-members, were randomly selected based on probability proportionate to size.

Both primary and secondary data were collected for the study, encompassing qualitative and quantitative information. Primary data was obtained through interviews conducted with the sample households using an interview schedule, and focus group discussions. Secondary data, which included relevant information from previous studies and reports, were also utilized in the research.

C. Method of data analysis

1) Perception of farmers towards dairy cooperatives

Farmer's perceptions towards dairy cooperatives were analyzed using Likert scale. In addition, Relative Importance index (RII) was used to analyze the item's relative importance, which was calculated as follows,

$$RII = \frac{\sum w}{AN} = \frac{5n5+4n4+3n3+2n2+1n1}{5N} \quad (1)$$

Where w is weighting given to each factor by the respondent, ranging from one to five. For instance, n1 = number of respondents for little important, n2= number of respondents for some important, n3= number of respondents for quite important, n4= number of respondents for important, n5=number of respondents for very important.

A is the highest weight (i.e. 5 for this study) and N is the total number of respondents. The relative importance index (RII) ranges from 0 to 1 (24). Scales for measuring farmer's preferences were given from 1-5, "1" for the lowest value and "5" the highest value in the case of positive statements, and the reverse is true for negative statements.

2) Constraints of dairy cooperative performance

Henry Garrett's ranking technique was employed to analyze the constraints of dairy cooperative performance. This technique was used to evaluate and prioritize the constraints of dairy cooperative performance. The orders of merit given by the respondents were converted into rank by using the formula given in equation 2. Thus, Garrett's ranking technique was used to find out the most significant factor that influences cooperative performance. Based on this method, respondents were asked to assign the rank for all factors, and the outcomes of such ranking were converted into score values by using a specified formula developed by [25].

$$\text{Percent position} = 100\left(\frac{Rij - 0.5}{Nj}\right) \quad (2)$$

Where, Rij = Rank given for the i^{th} variable by j^{th} respondents, and

Nj = Number of variables ranked by j^{th} respondents

III. Results and Discussions

A. Socio-Economic Characteristics of Households

The socio-economic characteristics of sample households are presented in Table 1. The result indicates that members of the dairy cooperative are more aged, better educated, and have more resource ownership like land and livestock as compared to non-members.

Age: The higher mean age among cooperative members may indicate that older individuals are more interested in and inclined to join the cooperative. This could be due to factors such as experience, stability, and a desire to secure additional income or social connections through cooperative membership.

Educational level: The significant difference in educational attainment between members and non-members suggests that higher education may contribute to cooperative membership. Individuals with higher levels of education may have a better understanding of the benefits and opportunities provided by the cooperative, leading to increased participation.

Livestock holding: The higher mean livestock holding among cooperative members indicates that households with larger livestock holdings are more likely to join the cooperative. This could be because cooperative membership offers access to resources, training, and markets that can benefit livestock production and income generation.

Distance to market: The significant difference in mean distance to the market between members and non-members suggests that proximity to the market may influence cooperative membership. Members residing closer to the market may find it more convenient to access markets for their products.

Distance to milk cooperative: The significant difference in mean distance to the milk cooperative between members and non-members indicates that proximity to the cooperative may play a role in membership. Being closer to the cooperative can make it easier for members to access services, training, and support provided by the cooperative, leading to increased involvement.

Improved cow ownership: The significantly higher mean number of improved cows among cooperative members suggests that ownership of improved cows is positively associated with cooperative membership. The cooperative likely promotes and supports the adoption of improved cow breeds, leading to increased ownership among its members.

Extension contact: The higher mean number of extension contacts among cooperative members indicates that greater interaction with extension services is associated with membership. Cooperative members may actively seek extension services for technical advice, training, and support, which can enhance their agricultural practices and productivity.

Market information access: The significantly higher proportion of market information access among cooperative members highlights the cooperative's role in providing market-related information to its members. This access to market information can help members make informed decisions about pricing, market trends, and marketing strategies, contributing to their economic success.

Table 1: Socio-economic characteristics of sample households

Variables	Members (N=123)	Non-members (N=143)	t-test/χ2 value
Age(years)	47.39	43.85	-3.09**
Educational level (Grade completed)	3.00	2.10	-5.69***
Household size (man equivalent)	3.20	2.94	-1.731*
Livestock holding (TLU)	8.00	6.39	-4.60***
Landholding size (ha)	1.61	1.64	0.26
Off-farm participation (yes)	0.27	0.32	0.01
Improved cow ownership (#)	1.37	0.36	-10.57***
Extension contact (#)	5.12	2.52	-5.13***
Distance to market (minute)	116.91	106.12	-3.73***
Distance to milk cooperative (minute)	26.21	48.74	9.18***
Access to credit(yes)	0.13	0.11	1.61
Market information access (yes)	0.43	0.17	104.09***

Note: ** and *** = significant at 5 and 1% level, respectively

B. Farmers Perception towards Dairy Cooperatives

Farmer's perceptions towards dairy cooperatives were analyzed based on the relative importance index for the likert statement scales. Both positive and negative likert scale statements were equally included in the analysis. Positive likert statements were developed by considering the relative advantage of dairy cooperatives (Table 2). On the other hand, as presented in Table 4, negative statements were also prepared considering the concerns and relative disadvantages of dairy cooperatives. These Likert scale measurements used composite scores derived from an individual's responses to the multiple items on the scale [26]. According to Tefera & Gebre [27] farmers with a good perception of the current and future performances of the cooperatives are more likely to participate in dairy marketing cooperatives.

1) Farmers' perception of the relative advantage of dairy cooperatives.

Table 2 shows the distribution of items based on the perception of farmers towards dairy cooperatives. Five-point scales were used to identify how certain attributes of dairy cooperatives meet the preferences of farmers being members of dairy cooperatives. The scales are 1 (strongly disagree), 2 (disagree), 3 (not decided), 4 (agree), and 5 (strongly agree). In the advantage list of attributes the value given greater than the mean score of three (the midpoint of a five-point scale) indicates how the farmer perceives the attributes under evaluation as good or positive and vice versa for the dis advantage lists.

Based on the analysis result shown in Table 3, among the listed advantageous attributes of dairy cooperatives: increasing social network among farmers, improving income of dairy farmers, serving as a Saving source and having sound pricing method take the highest score with a rank of 1st , 2nd , 3rd , and 4th , respectively. The rest positive attributes like serving as a

source of market information, improving farmers' knowledge in buying and selling livestock, supplying dairy farm inputs at fair prices, and serving as a source of credit receive 5th, 6th, 7th, and 8th ranks, respectively. Tables 2 and 3 present the detailed result of farmer's perception of dairy cooperatives. The percentage distributions of farmer's perception towards advantageous attributes of dairy cooperatives are presented in Fig. 1.

TABLE II: FARMER'S PERCEPTION OF THE RELATIVE ADVANTAGE ATTRIBUTES OF DAIRY COOPERATIVES

List of attributes	Dairy cooperative members (123) Distribution of respondents						Dairy cooperative non-members (143) Distribution of respondents						χ^2
	Sa	A	Nd	D	Sd	Ms	Sa	A	Nd	D	Sd	Ms	
It is good in the Provision of credit service	16	11	16	25	55	2.3	12	14	25	27	65	2.1	2.3 ns
It can improve the income of farmers	61	49	13	-	-	4.4	75	42	20	2	4	4.2	8.0*
It increases the social network of farmers	67	48	8	-	-	4.5	73	54	12	2	2	4.4	3.9ns
It Supplies dairy farm inputs at fair price	20	27	7	33	36	2.7	14	12	20	51	46	2.3	16.7***
It serves as a Saving source	58	39	19	6	1	4.2	57	55	12	13	6	4.0	9.0*
It provides sufficient market information	17	32	24	31	19	3.0	18	24	15	59	27	2.6	11.9**
It do have a sound pricing method	28	36	17	37	5	3.3	36	37	26	40	4	3.4	1.6ns
It is good for improving knowledge of buying and selling of livestock's	19	18	12	30	44	2.5	17	22	19	43	42	2.5	2.9ns

Where; Sa=strongly agree, A=agree, D=not decided, D=disagree, Sd=strongly disagree. Ms=mean score. ***, **, and * =Significant at 1%, 5%, and 10% significant level, respectively. Source: own household survey, 2021

Dairy cooperatives increase the social network among farmers: The relative importance index analysis (Table 3) indicates that increasing the social network of farmers received the 1st rank among the listed advantageous attributes of dairy cooperatives. The results of Table 2 and Figure 1 also presented that, 67(54.5%) dairy cooperative members and 73(51%) non-members strongly agree that, dairy cooperatives improve the social linkage among farmers. Even though the percentage of members is greater than non-members, both of them have perceived that cooperatives are effective in increasing social linkage among farmers since cooperatives require cooperation and coordination. Similar findings were reported by Feng et al. [28], who described that the social capital of members is significantly higher in Sweden. Another study in India also revealed that the willingness of farmers to join cooperatives depends on the social contacts that can be developed by organizing events such as fairs [29].

Dairy cooperatives improve the income level of farmers: As indicated in Table 2, 89.4% (49.6% strongly agree and 39.8% agree) of members and 81.8% (52.4% strongly agree and 29.4% agree) of non-members perceived the profitability of dairy cooperatives through improving the income level of farmers. The RII presented in Table 3 also depicted that, the role of cooperatives in enhancing the income level of farmers gained the 2nd rank among the advantageous attributes of dairy cooperatives. The result indicates that the majority of farmers in the study area have a good perception of the positive contribution of dairy cooperatives in improving the income of farmers. This result is consistent with Sindhia et al. [30], who revealed the positive perception of farmers about farmer producer organizations and feel it is good for their economic development

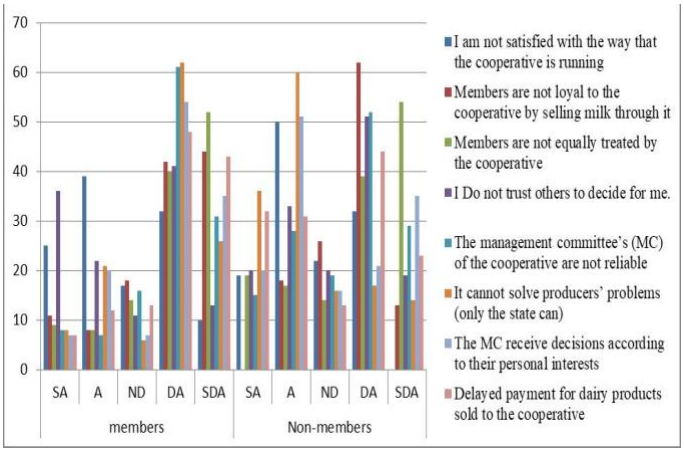

Fig. 1. Distributions of farmers' perception towards advantageous attributes of dairy cooperatives (in %)

Dairy cooperatives serve as a saving source: This attribute is the 3rd most important item based on its relative importance index (Table 3). The analyzed result showed that 47.2% of dairy cooperative member farmers strongly agree on the role of cooperatives in serving the community as a saving source (Table 2). This might be because farmers supply their milk product

throughout the month and receive their money at the end of each month from the cooperative. On the other hand, only 39.9% of non-member farmers strongly agree that dairy cooperatives can improve the saving capacity of farmers. The result in Table 2 indicates that a significant perception difference was found between member and non-member farmers in the study area. The finding is in line with Petcho et al. [31], who reported that there is a strong farmer's perception of rice producer cooperatives' role as a saving source and supplying farm inputs at fair prices.

Dairy cooperatives do have sound pricing methods: Table 2 shows that almost half of the cooperative member households have a positive perception of the pricing method of cooperatives. Similarly, 50% of non-member households perceived that dairy cooperatives have good prices. The result indicates that a significant perception difference was not found among member and non-member farmers concerning this attribute. Contrary to this result, the study conducted in Turkey reported that the majority of farmers did not agree on the effectiveness of cooperatives in selling products at competitive prices [22].

It provides sufficient market information: As shown in Table 2, about 26 % of members positively agreed on the significant contribution of dairy cooperatives in providing market information. On the other hand, the majority of non-members were dis agreed on the positive role of dairy cooperatives in providing market information. The result is contradicted by Karadas et al.[32], who pointed out that, cooperatives serve as a sort of information exchange.

Both members and non-members of dairy cooperatives have weak perceptions of the rest of the advantageous attributes. As depicted in Table 2, the mean score of these attributes is below the midpoint of the five-point scale (that is 3) implying that farmers perceived that dairy cooperatives were not good at improving knowledge of buying and selling livestock; did not supply dairy farm inputs at a fair price; and it is not good in providing credit service for farmers. This finding is consistent with Pecho et al. [31], who reported that farmers have a weak perception of the credit provision role of rice production community enterprises in Thailand.

2) Farmers' perception of the relative disadvantages attribute of dairy cooperatives

The analysis result of dis advantageous attributes of dairy cooperatives in Table 4 showed variations in the perceptions of dairy cooperative members and non-members across different attributes. Non-members tend to have a more critical view of loyalty, reliability of the management committee, problem-solving abilities, decision-making processes, and delayed payments. In contrast, members generally exhibit a more positive perception in these areas. These findings highlight the importance of addressing concerns and improving communication, trust, and transparency to foster a positive perception of the cooperative among both members and non-members. Fig. 2 depicts the percentage of sample respondents on relative disadvantageous attributes of dairy cooperatives.

TABLE III: RELATIVE IMPORTANCE INDEX OF ADVANTAGEOUS ATTRIBUTES OF DAIRY COOPERATIVES

Attributes	RII	Attribute rank
List of positive statements		
It is good in the provision of credit service	0.44	8th
It can improve the income of farmers	0.87	2nd
It increases the social network of farmers	0.88	1st
It supplies dairy farm inputs at a fair price	0.49	7th
It serves as a Saving source	0.79	3rd
It provides sufficient market information	0.56	5th
It do have a sound pricing method	0.68	4th
It is good for improving knowledge of buying and selling of livestock's	0.50	6th

Source: own household survey, 2021

The RII results in Table 5 indicate that, not satisfied with the way the cooperative is working, don't trust others' decisions, inability to solve producer problems, make decisions based on the interest of the management committee, delayed payment, members are not loyal to the cooperative, unequal treatment of members by the cooperative, and unreliability of the management committee take 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, and 8th ranks, respectively.

Not satisfied with the way the cooperative is running: This statement takes the 1st rank among the listed eight negative likert statements of dairy cooperatives (Table 5). Based on the surveyed result presented in Table 4, the highest proportion of respondents (both members and non-members) agreed on unsatisfactory way of running the cooperative. Thus, the result depicts that the cooperative must identify the specific areas of concern and take steps to address them to enhance overall satisfaction among stakeholders.

Don't trust others to decide for me: As shown in Table 4, the mean score value for members is greater than non-members implying that a higher level of trust is expressed by members compared to non-members. This indicates that members have more confidence in the decision-making processes within the cooperative. Further underscores the importance of involving members in decision-making and ensuring that their voices are heard and considered, which can help build trust and strengthen their commitment to the cooperative. The RII result showed that this attribute takes the 2nd rank among other disadvantageous attributes. Similarly, participants of the focus group discussion also revealed that the collective decision-making process is in favor of opinion leader farmers and they are unhappy about the influence of others on their views and issues. The result is consistent with Hakelius & Hansson [33], who explored that individual members, cannot influence the business decisions since it is the chief executive officer and the directors who decide.

Dairy cooperatives cannot solve producer problems (only the state can): As shown in Table 5, this attribute receives the 3rd rank among these listed disadvantageous attributes of dairy cooperatives. The surveyed result in Table 4 also shows that the majority of members disagree on the inability of cooperatives to

solve producer problems. On the contrary, the majority of non-members agree that cooperatives cannot solve producer problems (only the state can solve it). The significant difference in perception between members and non-members regarding the cooperative's ability to solve producers' problems highlights a potential gap in communication and understanding. The cooperative should actively communicate its efforts in addressing producers' concerns and emphasize its role in providing solutions. This can help bridge the perception gap and enhance confidence in the cooperative's problem-solving capabilities

The management committee receives decisions according to their interests: The result indicates only 5.7% of member and 14% of non-member respondents strongly agree with the interference of cooperative management committees in the decision-making process. Even though the number of respondents who agreed on this attribute is few there are still concerns about the transparency and fairness of the cooperative's governance processes especially by non-members. Therefore, the cooperative needs to demonstrate its commitment to the collective good, ensure transparent decision-making processes, and actively engage stakeholders to address these perceptions and build trust. Similar findings were reported by Hakelius & Hansson [33], who reported the board and the chief executive officer usually govern the cooperative in their way, without caring about what the members think.

TABLE IV: FARMER'S PERCEPTION OF THE RELATIVE DISADVANTAGES OF DAIRY COOPERATIVES

List of attributes	Dairy cooperative members (123) Distribution of respondents						Dairy cooperative non-members (143) Distribution of respondents						χ^2
	Sa	A	Nd	D	Sd	Ms	Sa	A	Nd	D	Sd	Ms	
I am not satisfied with the way that the cooperative is running	25	39	17	32	10	3.3	19	50	22	32	-	3.1	4.67ns
Members are not loyal to the cooperative by selling milk through it	11	8	18	42	44	2.1	24	18	26	62	13	2.8	29.5***
Members are not equally treated by the cooperative	9	8	14	40	52	2.0	19	17	14	39	54	2.4	5.39ns
I Do not trust others to decide for me.	36	22	11	41	13	3.2	20	33	20	51	19	2.9	10.2**
The management committee (MC) of the cooperative is not reliable	8	7	16	61	31	2.2	15	28	19	52	29	2.6	14.35***
It cannot solve producers' problems (only the state can)	8	21	6	62	26	2.4	36	60	16	17	14	3.6	69.26***
The MC receives decisions according to their interests	7	20	7	54	35	2.3	20	51	16	21	35	3.0	36.54***
Delayed payment for dairy products sold to the cooperative	7	12	13	48	43	2.1	32	31	13	44	23	3.0	29.32***

Where; Sa=strongly agree, A=agree, D=not decided, D=disagree, Sd=strongly disagree. Ms=mean score. ***, and ** =Significant at 1%, and 5% significant level, respectively. Source: own household survey, 2021

Delayed payment for dairy products sold to the cooperative: This attribute takes the 5th rank among the negative likert statements (Table 5). The analysis result in Table 4 showed that only 7(5.7%) of members agreed the payments are delayed for the dairy products sold to the dairy cooperative. However, about 63 (32 strongly agree and 31 agree) non-member respondents were dissatisfied by the time of payment for the dairy products sold to the cooperative. this implies that The dissatisfaction expressed by non-members regarding delayed payments emphasizes the importance of timely and fair payment practices. The cooperative should prioritize efficient payment systems and clear communication to ensure prompt payment to producers, which can contribute to increased trust and satisfaction among members and non-members alike.

Members are not loyal to the cooperative by selling milk through it: many authors showed that having loyal members is crucial for the success of the cooperatives [34, 35]. However, the surveyed result indicated that only 8.9% of members and 16. 8% of non-members agreed on the loyalty problem of members to their cooperative in selling their dairy products. This indicates that non-members were more critical, with higher proportions of

disagreeing and strongly disagreeing compared to members. This suggests that non-members perceive a lack of loyalty among members in selling milk to the cooperative. The RII result in Table 5 showed that it takes the 6th rank among negative attributes. The result of this study agrees with the finding that indicates farmers must support their cooperatives by patronizing and financing them [36]. The finding by Karadas et al. [32], also explored that, if members are committed to the farmer cooperatives, the economic situation of all members will improve in the long run.

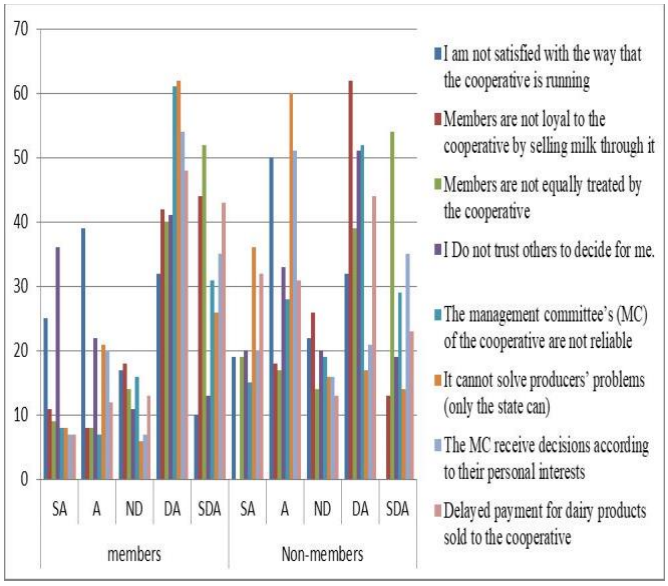

Fig.2. Distributions farmers' perception on disadvantageous attributes of dairy cooperatives (%)

Members are not equally treated by the cooperative: The unequal treatment of members by the cooperative ranked 7th among other negative attributes (Table 5). Both members and non-members were less likely to agree on member discrimination by the cooperative suggests that both groups have a similar view on this aspect (Table 4). The majority of both members and non-members perceive that members are equally treated by the cooperative. This indicates a positive perception regarding fairness within the cooperative. However, it is crucial to monitor and address any potential disparities or instances where members may feel they are not receiving equal treatment to maintain a harmonious and inclusive cooperative environment. This result is in line with the study by Karadas et al. [32], who point out everybody is equal in the cooperative.

The management committee (MC) of the cooperative is not reliable: Both members and non-members generally view the management committee as reliable, although there is a significant difference in perception between the two groups (Table 4). This indicates a certain level of trust in the committee's ability to fulfill its responsibilities. However, the cooperative needs to maintain transparency, communicate effectively, and ensure that the management committee acts in the best interest of all members to foster continued trust and support

TABLE V: RELATIVE IMPORTANCE INDEX OF DIS ADVANTAGEOUS ATTRIBUTES OF DAIRY COOPERATIVES

Attributes	RII	Attribute rank
I am not satisfied with the way that the cooperative is running	0.64	1st
Members are not loyal to the cooperative by selling milk through it	0.51	6rd
members are not equally treated by the cooperative	0.44	7th
I do not trust others to decide for me.	0.61	2nd
The MC of the cooperative is not reliable	0.49	8th
It cannot solve producers' problems (only the state can)	0.60	3rd
The MC receives decisions according to their interests	0.53	4th
Delayed payment for dairy products sold to the cooperative	0.52	5th

Source: own household survey, 2021

C. *Constraints of Dairy Cooperatives*

To identify the most significant constraint that influences dairy cooperatives' performance, Garrett's ranking technique was used. As per this method, respondents were asked to assign a rank for all the constraints, and outcomes of the ranking were converted into score value based on its formula as it was specified in the methodology part. The total Garrett scores of each factor were estimated by multiplying the Garrett value with the respective frequency of the factor. Hence, the total score is essential to calculate the average score given by the total respondents under different factors of a particular phenomenon. Constraints of dairy cooperatives in the study area were grouped into internal and external constraints. Similarly, according to Haile & Debeb [19], the challenges of cooperatives are broadly categorized into internal and external constraints. The ranks of internal and external constraints are presented in Figures 3 and 4, respectively.

1) Internal constraints of dairy cooperative performance

Lack of milk processing facilities: Among the listed internal constraints, the lack of milk processing facilities was the foremost challenge of dairy cooperatives in the study area with a mean Garrett score of 60.67 (Table 6). Milk is a highly perishable product that needs to be processed into other forms of dairy products (butter, cheese, etc.) to increase its shelf life. Thus, Cooperatives usually acquire new manufacturing technology by buying new machinery and equipment [37]. However, they are not well equipped with these processing facilities which will decline cooperatives' performance. This result is similar to Misganaw et al. [38], who reported that lack of milk processing machines is a major problem for dairy cooperatives in Axum and Adwa towns of Ethiopia. In addition to this, studies by Ahmed et al. [39], the title of dairy development in Ethiopia reported that lack of milk processing facilities and skills is one of the critical bottlenecks for dairy cooperatives among other constraints.

Poor member's awareness about dairy cooperative: Following lack of milk processing facilities, lack of awareness about (principles and values, bylaws, objectives, duties, and responsibilities of members and MC) was another critical constraint with an average Garrett score of 57.25 (Table 6).

People are not well informed about the objective of the cooperative, the principles, and values, the responsibilities and duties of members and MC, the contributions it can make in rebuilding the society, and the rules and regulations of dairy cooperatives. This limits dairy cooperatives' development and performance. Consistent results were reported by Haile & Dejen [19], Low awareness background of members is an internal challenge for agricultural cooperatives. Similarly, ILRI [40], reported lack of awareness about dairy cooperatives is a problem for South Ethiopian dairy cooperatives.

Poor involvement in the decision-making process: as shown in Table 6, low involvement in decision-making processes (setting up of objectives, approving bylaws and annual plan and budget) was the third important internal constraint of dairy cooperatives in the study area. Participation in decision-making processes is very critical for members to develop a sense of ownership of the cooperative. In addition to this if members are involved /participated/ in whatever the decisions made by the cooperative they will accept, obey, and implement it because they are part of the decision.

But, Members' participation in the decision-making process is very low, based on the information reported in the interviews and group discussions. Similarly, Nakkiran [41]; Brandão & Breitenbach [42]; Etefa [43] reported that members participate as listeners in the decision-making process which is a challenge for cooperatives. Besides that, lack of good management system, lack of coordination, and the problem of participation and commitment of members are the savior challenges of agricultural cooperatives in eastern Ethiopia [44].

Lack of adequate milk collection centers: as shown in the garrets ranking table, lack of adequate milk collection centers was the fourth important internal constraint of dairy cooperatives in the study area. Members need to supply their milk morning and afternoon to the dairy cooperative. However, it is difficult to supply twice a day for members who are far from the dairy cooperative and farmers having small family members. Therefore, milk collection sub-centers are highly recommended to alleviate such a problem. But, in the study area milk collection centers are not enough leading members to incur additional transaction costs for transportation and sometimes decide to consume in-house.

Lack of transparency and accountability, poor commitment and member participation in the cooperative and lack of innovative managers were other constraints of dairy cooperatives in the study area ranking fifth, sixth, and seventh respectively. In this respect studies by Haile & Debeb [19] pointed out lack of transparency and accountability and limitations on the capacity of the management committee are challenges for agricultural cooperative developments in Ethiopia. Another study by Ferreira & Arbage [45] reported that the greater the effectiveness of the fiscal council of a cooperative, the greater tends to be the loyalty of that cooperative.

TABLE VI: HENRY GARRETT RANKING FOR INTERNAL CONSTRAINTS OF DAIRY COOPERATIVES

Constraints	Tot. Garrett score	Mean Garrett score	Rank
Lack of milk processing facilities	7463	60.67	1st
Poor member awareness about dairy cooperative (principles and values, bylaws, objectives, duties, and responsibilities of members and MC)	7042	57.25	2nd
Poor involvement in the decision-making process (setting up of objectives, approving bylaws and annual plan and budget)	6768	55.02	3rd
Lack of adequate milk collection centers	6193	50.35	4th
Lack of transparency and accountability	6112	49.69	5th
Poor commitment and member participation in the cooperative	6069	49.34	6th
Lack of innovative managers	5881	47.81	7th
Lack of cooperation and coordination among members	5689	46.25	8th
Poor management	5503	44.74	9th
Delayed payment	4886	39.72	10th

Source: own household survey, 2021

On the other hand, as shown in Figure 3, delayed payment, poor management and lack of cooperation and coordination among members were less important constraints of dairy cooperatives in the study area ranked in tenth, ninth, and eighth place respectively. However, cooperatives may face problems such as conflict of interest among members, exploitation of members by dishonest members, lack of effective leadership, lack of total commitment by members, and inadequate and ill-timed supply of inputs by some members [46].

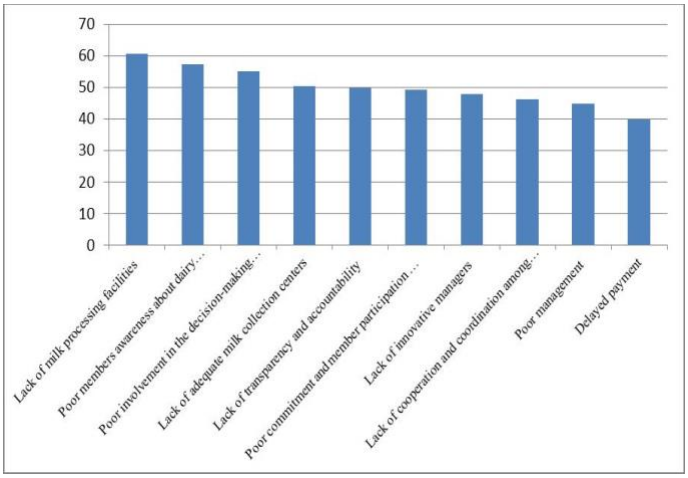

Fig.3. Internal constraints of dairy cooperatives

IV. EXTERNAL CONSTRAINTS OF DAIRY COOPERATIVE PERFORMANCE

High cost of improved dairy cows: Among external constraints affecting dairy cooperative performance; high cost of improved dairy cows was the leading constraint hindering the performance of dairy cooperatives in the study area with an

average Garrett score of 68.53 (Table 7). Improved dairy cows are good in terms of milk production which will improve member's milk production potential and dairy cooperatives' performance. But, as shown in Table 6 costs of those improved cows are very high and ranked as a primary external constraint in the study area. Studies by Panchbhai et al. [47], in India reported that high cost of crossbreed dairy animals restricts farmers' adoption of recommended technologies.

TABLE VI. HENRY GARRETT RANKING FOR INTERNAL CONSTRAINTS OF DAIRY COOPERATIVES

Constraints	Tot. Garrett score	Mean Garrett score	Rank
High cost of crossbreed dairy animal	8431	68.53	1st
Occurrence of animal disease	6830	55.54	2nd
Low milk production and productivity of local breed cows	6763	54.98	3rd
Unavailability of infrastructure	6503	52.87	4th
Inadequate training for members (awareness creation and management of dairy farms)	6169	50.15	5th
Inadequate access to capital and credit service	6087	49.49	6th
Strong computation from the private sector	5694	46.29	7th
low milk prices and high transportation costs	5519	44.87	8th
Inadequate support and weak regulation and supervision	5247	42.65	9th
Low awareness and Negative attitude of non-members	4498	36.57	10th

Source: own household survey, 2021

Occurrence of animal disease: On the other hand, as presented in Table 7, the occurrence of animal disease was the second most important external constraint of dairy cooperatives having an average Garrett score of 55.54. Results from focus group discussions also support the finding, i.e. farmers are frequently losing their dairy animals due to different animal diseases. In this regard, improved cows are highly affected by disease and there is a limitation of animal vaccination and medical service in the study area based on the reports of group discussion.

Low milk production and productivity of local breed cows: following the above constraints; Low milk production and productivity of local breed cows was another important external constraint of dairy cooperatives placed in the third position based on Henry Garrett's ranking value. The present finding is in agreement with Misganaw et al. [38], who reported that the poor milk yield potential of cows is a problem of dairy cooperatives in Axum and Adwa towns.

Unavailability of infrastructure: farmers in the study area faced several physical constraints to market their products and buy production inputs. Small-scale dairy farmers are confronted by insufficient means of transportation, absence of roads or bad roads, lack of energy, unavailability of banks, and lack of market access coupled with lack of agricultural processing equipment and storage facilities leads to a reduction of their income. Since the bargaining power of farmers is very low. Thus, the absence of updated and reliable market information and lack of established market linkage critically hinders cooperative performance. Similarly, Etefa [43] reported lack of adequate infrastructure is a challenge for cooperatives in Ethiopia. A study conducted in eastern Ethiopia showed that Lack of well-developed market infrastructures such as communication and transportation are the challenges for agricultural cooperatives [44]. Inadequate training for members is the fifth important external constraint for dairy cooperatives based on the surveyed results.

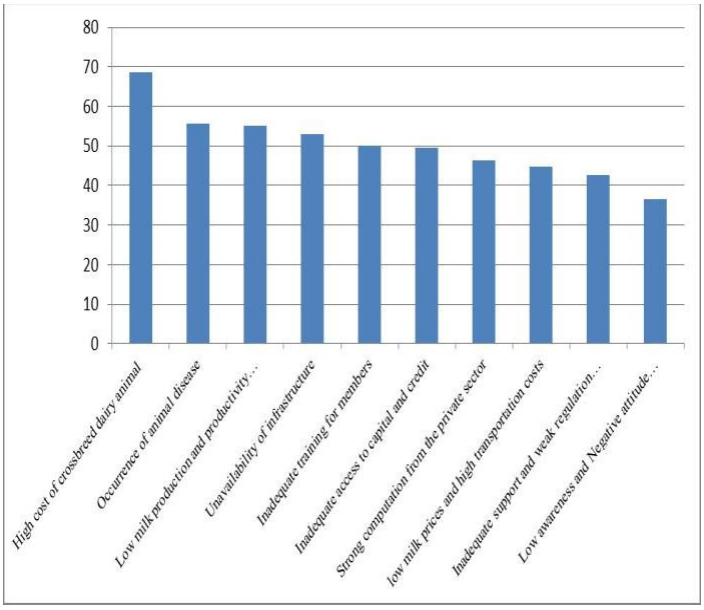

Fig. 4. External constraints of dairy cooperatives

Inadequate access to capital and credit service, and low milk prices and high transportation costs were relatively less important external constraints for dairy cooperatives in the area ranked sixth and seventh. Finally, low milk prices and high transportation costs, Inadequate support and weak regulation and supervision, and Low awareness and negative attitude of non-members were very less important constraints restricting dairy cooperative performance as compared to so far listed constraints ranked as eighth, ninth, and tenth, respectively (Fig. 4).

V. CONCLUSIONS AND POLICY IMPLICATIONS

Farmers had a positive perception of dairy cooperatives based on the average scores of the likert statements. Attributes such as increasing social networks, improving income, serving as a saving source, and having a sound pricing method received relatively high average scores, indicating that farmers perceive these attributes positively. However, there were also attributes related to not being satisfied with the way the cooperative is running, inability to solve producers' problems, and lack of trust in others' decisions that received average scores above the median value of the likert scale, suggesting that farmers have concerns and negative perceptions regarding these aspects of dairy cooperatives. Members had a higher mean perception of the advantages and a lower mean perception of the disadvantages of cooperatives compared to non-members. This indicates that being a member of a dairy cooperative influences farmers' perceptions of the advantages and disadvantages associated with cooperative membership.

The study identified that the absence of milk processing facilities negatively impacts the cooperatives' ability to increase the shelf life of milk and the value-addition of dairy products. Lack of awareness among members about the cooperatives also hinders the development and performance of dairy cooperatives. Low member participation in decision-making processes, limits their sense of ownership and hampers effective cooperative management. Insufficient milk collection centers pose challenges for members who need to supply milk to the cooperative. This leads to additional transaction costs and sometimes members resort to consuming the milk themselves. In the study area expensive crossbreed dairy animals hinder farmers' adoption of recommended technologies and limit the cooperatives' milk production potential. Furthermore, frequent outbreaks of diseases among dairy animals, limited access to animal vaccination and medical services, and the subpar milk production and productivity of local breed cows adversely affect the cooperatives.

Thus, emphasis should be given to: Addressing concerns and improving the overall functioning of dairy cooperatives to enhance farmers' perception and participation in cooperative activities; improving the cooperative's ability to solve producers' problems and build trust among members; enhancing awareness and education of farmers to foster a sense of ownership and promote active participation in cooperative activities; invest in milk processing facilities; improve access to veterinary services; facilitate access to affordable crossbreed cows and establish more milk collection centers to reduce transportation costs and ensure timely and efficient milk collection, benefiting both the farmers and the cooperative.

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