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Role of Cooperatives and Participation of their Members in Agricultural Output Marketing: Empirical Evidence from *Hetosa* District, Ethiopia

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Abstract

Today, in an era where many people feel powerless to change their lives, cooperatives represent a strong, vibrant, and viable economic alternatives. Cooperatives are formed to meet peoples' mutual needs. They are based on the powerful idea that together, a group of people can achieve goals that none of them could achieve alone. This research paper aims to analyse the role of cooperatives in agricultural output marketing, promoting linkages and to examine factors influencing the level of members' participation. The cooperatives under investigation have played significant role in output marketing and promoting value adding linkages with different stakeholders. Results of the Tobit model revealed that: farm size, years of membership, amount of improved seed used, output produced and members' perception on cooperatives price for agricultural outputs were significantly and positively related to the level of participation. Lack of equal opportunity of members in passing decisions, inefficient cooperatives' employees and incompetent management committee members are found to be the major constraints which hinder cooperatives to properly deliver agricultural output marketing services. To this end, Government, NGOs and other stakeholders need to give emphasis on improving the organizational and institutional capacity of cooperatives.

Keywords:
Agricultural cooperatives
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Management capacity
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1. Introduction

Policy makers have applied a wide variety of strategies to promote agricultural development in developing countries (Haki & Fedes, 2018). Except Africa, all developing regions of the world have achieved the Millennium Development Goal of reducing poverty by half between 1990 and 2015 (UN, 2015). As most of Africa's poor depend largely on agriculture for their livelihoods (IFAD, 2011) improving the productivity, profitability, and sustainability of the agricultural sector is argued to be the main pathway out of poverty in the continent (Asfaw, Shiferaw, Simtowe, & Lipper, 2012; Christiaensen, Demery, & Kuhl, 2011; Dawson, Martin, & Sikor, 2016). In spite of this fact, agricultural sector growth in Africa has been lagging (Diao, Thurlow, Benin, & Fan, 2012). Particularly the agricultural productivity in Sub Saharan Africa (SSA) remains stagnant (Tittonell & Giller, 2013). Over the past four decades, agricultural productivity growth in SSA averaged only 2.4% while the productivity of the rest of the developing world improved by 4% (Dzanku, Jirström, & Marstorp, 2015).

Ethiopia is among the countries in this region where agriculture plays a vital role in the economy. In the country, agriculture accounts for 40.2% of GDP, 80% of employment, and 70% of export earnings (UN, 2015). About 85% of its population live in rural areas and depend on agriculture for necessities and as a source of employment (Negatu, Kromhout, Mekonnen, & Vermeulen, 2016). Therefore, the performance of this sector determines the fate of the economy of the country. Nonetheless, smallholder farmers who are illiterate, living on the threshold between subsistence and poverty, dominate the sector. Their production system depends on outdated technologies coupled with lack of access to credit, market information, improved technologies, functioning markets (for inputs, outputs, finance, consumer goods, and services, etc.), and other infrastructure. Farmers can overcome those problems by acting cooperatively to obtain collective strength that they couldn't achieve individually, and in doing so, they find the pathway out of poverty and powerlessness (Bibby & Shawl, 2005; Birchall & Simmons, 2009).

Cooperatives, as economic enterprises and self-help organizations, play a meaningful role in uplifting the socio-economic conditions of their members and their local communities. The people of Ethiopia have a very long social history of working together to fulfil their socio-economic needs. Many social events are still taking place in rural Ethiopia through collective efforts. The Government of Ethiopia has identified the cooperative form of business organizations as instrumental to socioeconomic development and has paved the way for better cooperative development in the country by creating the legal basis and expansion of human resource development at higher institution levels (MoA, 2012).

An important service provided by cooperatives is through the enhanced bargaining power they offer farmers in purchasing inputs from suppliers or selling outputs to clients. The main advantage of cooperatives is through economies of scale in physical transaction costs (Bernard, Gashaw, & Solomon, 2013). According to Zerihun (2003) cooperatives are indispensable in Ethiopia where farm holdings are small, low application of modern technology and subsistence nature of production with low marketable surpluses. Nevertheless, in Ethiopia studies have shown that cooperatives were taken as a threat, a source of insecurity and burden. For example, Dessalegn (1992) revealed that, in the previous period only a few weeks after the Ethiopian government announced the mixed economic policy, majority of cooperatives were dissolved by their own members.

Currently, cooperatives are playing a central role in the country's rural development strategy. Cooperatives in general and that of the agricultural cooperatives in particular play significant role in improving outputs marketing activity of farmers. Since farmers have poor marketing skill and limited bargaining power, they are usually price takers. Although cooperatives are considered as an appropriate tool of rural development they are facing critical problems, which hinder them from their positive contribution in the economy of the country. Some of the constraints of agricultural cooperatives are: low institutional capacity, inadequate qualified personnel, low entrepreneurship skill, lack of financial resources, lack of market information and poor members' participation in different activities of the cooperatives (Bishop & McCone, 1999).

Agricultural cooperatives are longstanding and widespread throughout the country with varying degrees of success. There have been only a few attempts made to understand their commercialization role in collecting and selling members' produces. According to Francesconi and Heerink (2010) there is a higher commercialization rate for the farmers that belong to agricultural cooperatives, which suggest the importance of organizational form in cooperative inquiries.

In Ethiopia, output commercialization is much less important as reasons for joining a cooperative, although with significant variations across regions. Commercialization of outputs through cooperatives is much less common. In the country, supplying agricultural inputs and credit are the most important activities of cooperatives. On the other hand, commercialization services (i.e., aggregating and selling agricultural outputs) through cooperatives, are more limited (Bernard et al., 2013). Though there are some cooperatives which are playing significant role in agricultural output marketing, information about the success of these cooperatives and the intensity of their members' participation is limited.

Therefore, the focus of this study is to generate information on agricultural output marketing of cooperatives, by taking sample cooperatives in the country by which research has not been conducted so far. The specific objectives of the study are: to assess the role of cooperatives in promoting linkage for delivering agricultural output marketing, to identify factors influencing the level of participation of cooperative members in agricultural output marketing and to identify the major constraints of agricultural cooperatives in delivering agricultural output marketing services. Results of the study will give clear insights for policy makers and development actors for designing appropriate policy directions in promoting agricultural cooperatives.

2. Hypotheses

For this study, monetary value of wheat marketed through agricultural cooperatives in the year 2016 is taken as a dependent variable. On the other hand, level of participation of members in selling their output through cooperatives is hypothesized to be influenced by a combined effect of various factors such as household characteristics, socioeconomic characteristics, organizational characteristics and other institutional

characteristics; which all are considered as an independent variables. Based on literatures and formal assessment held in the area, the major independent variables hypothesized to influence the level of participation are:

Education Level (EDUCATION): It is a continuous variable and refers to the number of years of formal schooling that members attended. The higher the education level, the better would be the awareness of the member towards the cooperative and acquire information and education about the benefits of the cooperative easily (Klein, Richards, & Walburger, 1997). Hence, those members with higher formal education are in a better position to know the benefits of cooperatives and more likely to participate in output marketing activities. So, this variable is expected to influence the level of participation of output marketing positively.

H1: Education level of the household head affects the level of participation in output marketing through cooperatives positively.

Years of membership (MEMBERSHIP): This variable is a continuous variable and it refers to number of years since the farmer has been the member of the cooperatives. Farmers having longer years of membership are in a better position to know the benefits of the cooperative than farmers with shorter years of membership (Cain, Toensmeyer, & Ramsey, 1989).

H2: Farmers with long years of membership experience are in a better position to sale their outputs through cooperatives.

Family Size (FAMILYSIZE): This variable is a continuous variable and refers to the total number of people in the family the household has in terms of adult equivalent (AE). It is assumed that households with larger family size consume more of what is produced in the house and little will remain to be marketed.

H3: Family size is expected to have negative influence on the level of participation of output marketing through cooperatives.

Nonfarm Income (NONFARMI): It is a dummy variable taking a value 1 if members get income from nonfarm activities, 0 otherwise. This additional income improve members' financial position that in turn enable them to invest in purchasing the needed amount of farm inputs especially fertilizer and renting land. This increases the yield to be marketed. At a highest level of nonfarm income, grain farmers tend to use cooperatives more intensively (Klein et al., 1997).

H4: Nonfarm income affects the level of participation of members in output marketing positively.

Farm Size (FARMSIZE): This variable is a continuous variable and it refers to the total area of farmland that a member owns in hectare. The usage of the cooperative as marketing agent requires substantial economic resources of which land is the principal one (Wadsworth, 1991). It is assumed that the larger the total area of the farmland the member owns, the higher would be the output.

H5: Farm size has positive influence on the level of participation of members in output marketing through cooperatives.

Total Livestock Holding (TLSH): This variable is a continuous variable and refers to the total number of livestock members owned in terms of tropical livestock unit (TLU). It is assumed that members with larger TLU have better economic strength and financial position to purchase sufficient amount of agricultural inputs to produce more amount of outputs.

H6: Having more number of livestock has positive association with the level of participation in output marketing through cooperatives.

Output Produced (OUTPUTPROD): This is a continuous variable and refers to the amount of outputs that members get in quintal. It is assumed that the level of participation of members in output marketing is positively related to the amount of output they get. The higher the output, the higher would be their participation.

H7: The higher the output produced by members of the cooperatives, the higher their participation in output marketing through cooperatives.

Member's Perception on Cooperative Price for Agricultural Output (OUTPUTPRI): This variable takes a value of 1 if members' perceive, cooperatives price of output is better than the market price in the area and, 0 otherwise. The price effect is one that the cooperative passes on the farmers' economy (Chukwu, 1990). Therefore, if the cooperative charges competitive price for agricultural outputs in the area, farmers sell through the cooperative (Klein et al., 1997; Misra, Carley, & Fletcher, 1993).

H8: Members' perception on cooperative price of outputs influence their level of participation positively.

Availability of other marketing agents (OMARKAG): This is a dummy variable taking a value of 1 if there are other marketing agents in the area, 0 otherwise. Members will get alternative market outlet to sell their output if there are other marketing agents in their area. Cooperatives face market competition if there are other marketing agents in the area of the farmer performing similar activity with them (Bishop & McCone, 1999).

H9: The presence of other marketing agents in grain marketing activity is expected to influence the level of participation through cooperatives negatively.

Credit (CREDIT): This is a dummy variable which takes a value of 1, if members get credit from their cooperatives or other financial institutions, 0 otherwise. Credit plays an important role to purchase fertilizer

and other agricultural inputs that increase productivity. This in turn leads to increase production and the amount to be marketed.

H10: The presence of credit has positive influence on the level of participation of members in output marketing.

Members' Perception on Price of Inorganic Fertilizer (FERTILIZERPRI): This is perception of members on the cost of inorganic fertilizer (DAP and UREA) which is supplied by the respective cooperatives. It can be perceived as high or low by assigning the value of 1 and 0, respectively. If members perceived that there is high price of inorganic fertilizer, the lower would be fertilizer use and there by lower output produced.

H11: Members perception on price of inorganic fertilizer has negative influence on the level of their participation in agricultural output marketing through cooperatives.

Amount of Improved Seeds Used (SEEDUSED): This is a continuous variable and refers to the amount of improved seeds that members used in kilogram. It is assumed that the level of participation of members in output marketing is positively related to the amount of improved seeds used.

H12: Adequate amount of improved seeds used by members, the higher would be the output and there by the higher would be their participation in output marketing.

Distance of the Cooperatives Output Collection Centres from Members' Residence (DCFR): It is a continuous variable measured in kilometre to reach the cooperatives output collection centres. The proximity of the cooperatives for members' residence reduces the cost of time and labour that farmers spent in searching for buyers. The other advantage is that as the member is close (near) to the cooperative, he/she will have more knowledge about the cooperative and its benefits (Bishop & McCone, 1999).

H13: Distance of the cooperatives output collection centres from the members' house is expected to influence their participation negatively.

3. Materials and Methods

3.1. Sampling and Data Collection

A two-stage random sampling procedure was adopted for the selection of the sample households who are members of the agricultural cooperatives. In the first stage, out of 15 agricultural cooperatives who are practising output marketing activities, three cooperatives were randomly selected. In the second stage, from the total number of 1,198 members of the respective cooperatives, 122 cooperative members were selected randomly using probability proportionate to size. Data were collected both from primary and secondary sources.

3.2. Data Analysis

3.2.1. Descriptive Statistics

Descriptive statistical tools were used to analyse the quantitative data. The important statistical measures that were used include means, percentages and frequencies. To test if there were significant differences between market participants and non-participants in terms of explanatory variables, t-test for continuous variables and Chi-square-test for dummy variables were used. The role of cooperatives in promoting linkages for delivering agricultural output marketing service was analysed by applying participatory mapping techniques.

3.2.2. Econometric Model Specification

The econometric model, which was applied for analysing factors influencing the level of participation of members in output marketing through the cooperatives is the Tobit model. This model was chosen because it has an advantage over other models in that, it reveals both the probability of participation and the level of participation. Following Maddala (1992); Johnston and Dinardo (1997) and Green (2000) the Tobit model can be defined as:

$Y_i^* = \beta X_i + U_i$ $i = 1,2, \ldots, n$

$Y_i = Y_i^*$ if $Y_i^* > 0$

$Y_i = 0$ if $Y_i^* \leq 0$

Where, Y_i = the observed dependent variable, in this case monetary value of output marketed through the cooperatives

Y_i^* = the latent variable which is not observable

X_i = vector of factors influencing the level of participation of members in output marketing through the cooperatives

β = vector of unknown parameters

U_i = residuals that are independently and normally distributed with mean zero and a common variance $\delta 2$. Note that the threshold value in the above model is zero. This is not a very restrictive assumption, because the threshold value can be set to zero or assumed to be other value (Green, 2000). The Tobit Model shown above is also called a Censored Regression Model because it is possible to view the problem one where observations of Y_i^* at or below zero are censored Johnston and Dinardo (1997) and (Green, 2000).

4. Results and Discussions

4.1. Descriptive Results

4.1.1. Agricultural Output Marketing through Cooperatives

In *Hetosa* district, agricultural cooperatives play significant role in providing agricultural output marketing service for their members. Members are using their cooperatives to sell their agricultural output, specifically wheat. *Hetosa* Agricultural Cooperatives Union is the major collector of agricultural output from primary cooperatives. After adding some margins, the primary cooperatives supplied agricultural output, which was collected from members to *Hetosa* Agricultural Cooperatives Union.

As indicated in Table 1 below, the output marketing activity of cooperatives in the district had decreased from year 2013 to 2014 because there was increment of price of agricultural inputs and low involvement of output marketing activity by members. In the year 2015 and 2016, output marketing activity had increased. During those fiscal years most cooperative members participated in output marketing through cooperatives, since some cooperatives started to give a competitive price for agricultural outputs.

Table-1. Output marketing activity of cooperatives in the district.

Year	Volume of output sold in Quintal	Value of output sold in Ethiopian Birr	Value of output sold in US Dollar
2011	5540	3,767,200	218,852.75
2012	6400	4,480,000	252,721.84
2013	5100	4,258,500	223,977.15
2014	4800	4,080,000	202,329.77
2015	5900	5,428,000	263,096.67
2016	7200	6,840,000	315,554.92

Source: *Hetosa* district Cooperatives Promotion Office (2016).

4.1.2. Role of Cooperatives in Promoting Linkages

In the study area, cooperatives play significant role in promoting linkages with different organizations for mutual benefits. Focus group discussion held with the management committee members of the cooperatives revealed that, agricultural cooperatives had linkage with the Zonal Cooperatives Promotion Office, the district Cooperatives Promotion Office, the district Agricultural Office, Non-Governmental Organizations, *Hetosa* Farmers Cooperatives Union, Oromia Seed Enterprise, Banks, local administration offices and other primary cooperatives.

The zonal and district cooperative offices are providing technical support to the respective cooperatives in facilitating marketing activities and providing capacity building services. The linkage with the district agricultural office lies on the provision of technical support and provision of agricultural inputs. Non-governmental Organizations who are working in the area are also providing technical and material supports to the respective cooperatives. Oromia cooperatives Bank is providing a short term and medium term credit services to the respective cooperatives. The Oromia seed enterprise is providing improved seeds to the respective cooperatives. Moreover, *Hetosa* Farmers' Cooperatives Union is providing credit, marketing, technical and information services to the respective primary agricultural cooperatives. The respective cooperatives have strong linkage with these stakeholders. On the contrary the respective cooperatives have weak linkage with commercial bank of Ethiopia, local administrators and other primary agricultural cooperatives Appendix 3.

4.1.3. Socioeconomic Characteristics of Sample Respondents

Out of 122 sample member farmers, 74.6% of them marketed their output through their cooperatives, while 25.4% of them did not market their output through their cooperatives. The average age of the sample farmers is 42.7 years. The minimum and the maximum age is 26 and 58, respectively. The participants and non-participants average age is 42.14 and 44.35 years, respectively. A two sample t-test was conducted to compare the difference in mean age between participants and non-participants Table 2. There was statistically significant difference at 5% probability level between participants and non-participants with regard to age. This shows that, non-participants are more aged than participants.

The mean land ownership of the sample households' is found to be 2.01 hectare. The corresponding figure for cooperative users and non-users is 2.1 hectares and 1.74 hectares respectively Table 2. Nonetheless, a two sample t-test indicated that, the difference in mean land ownership between participant and non-participant sample respondents is statistically non-significant. The average family size of the sample households' is 5.74 persons, with maximum and minimum family size of 3 and 7 persons, respectively. The average family size of the sample households' that participated in output marketing through cooperatives was 4.12 persons and the corresponding figure for non-participants was 6.85 persons Table 2. The two sample t-test showed that, the mean difference between participants and non-participants with respect to family size was found to be statistically significant at 1% probability level. This indicates that, respondent farmers who have less family

members were participating in output marketing better than households' who have higher number of family size.

On the average, livestock holding for the sample households was 12.34 TLU (Tropical Livestock Unit). The respective average livestock holdings for participant and non-participant households were 12.57 TLU and 11.65 TLU, respectively Table 3. Nevertheless, the analysis showed that, the mean difference between participants and non-participants with respect to livestock holdings was found to be statistically non-significant. The average years of membership of the sample farmers in the cooperative was 9.62 years, with maximum and minimum of 25 years and 2 years, respectively. The average years of membership for participants was 10.23 years while the corresponding figure for non-participants was 7.83 years Table 2. On the other hand, a two sample t-test showed that, the mean difference between participants and non-participants was statistically non-significant. The average annual improved seed used by the sample farmers was 199.18 kilogram. The participants used on average 207.69-kilogram improved seed whereas the non-participants used on average 174.19 kilogram Table 2. However, a two sample t-test indicated that, there was no statistical significant difference between participants and non-participants in using improved seed.

Table-2. Distribution of sample farmers by continuous variables.

Explanatory variable	Participant		Non-participant		Total sample		t-value
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	
Age (Year)	42.14	6.52	44.35	4.85	42.7	6.19	1.73**
Education	2.52	2.73	3.28	2.61	3.09	2.71	−1.37
Family size (number)	4.12	2.1	6.85	2.29	5.74	2.39	5.43***
Farm size holding (hectare)	2.1	0.7	1.74	0.68	2.01	0.71	−2.5
Livestock holding (number)	12.57	4.21	11.65	4.94	12.34	4.41	−1.01
Membership (years)	10.23	4.98	7.84	3.58	9.62	4.76	−2.46
Distance of a cooperative from residence (hours)	5.6	2.43	5.22	2.01	5.41	2.22	−0.87
Improved seed used (kg)	207.69	72.24	174.19	44.48	199.18	67.72	−2.43
Output produced (quintal)	56.91	29.17	40.42	18.43	52.72	27.73	−2.95

Source: Computed from the field survey data (2016). ***, ** represent 1% and 5% level of significance, respectively.

Out of the sample farmers, 63.1% were perceived that the output price set by the cooperative was low. The corresponding figure for those that used the cooperative as their marketing agent for their output and for those that did not use are 54.9% and 87.1% respectively. The χ 2 -test analysis showed the existence of statistical significant differences at 1% probability level between participants and non-participants in perception of output price Table 4. The analysis indicates that, members who did not use the cooperative as their marketing agents are perceived that the output price set by the cooperatives is low.

More than half of the sample member farmers (54.1%) had got other marketing agents, which are purchasing output, around their area at a distance less than their cooperative. The corresponding figure for participants and non-participants were 47.3% and 74.2% respectively. Accordingly, the χ 2 -test showed that, there are statistically significant difference at 1% probability level between participants and non-participants Table 3.

Table-3. Distribution of the sample farmers by discrete variables.

Explanatory variable		Participants		Non-participants		Total Sample		χ2 value
		Number	%	Number	%	Number	%	
Perception on price of fertilizer	High	83	91.2	28	90.3	111	91	
	Low	8	8.8	3	9.7	11	9	0.2
Perception on output price set by the cooperative	High	41	45.1	4	12.9	45	36.9	10.3***
	Low	50	54.9	27	87.1	77	63.1	
Availability of other marketing agents	Yes	43	47.3	23	74.2	66	54.1	6.8***
	No	48	52.7	8	25.8	56	45.9	
Do you get non-farm income	Yes	12	13.2	6	19.4	18	14.8	0.7
	No	79	86.8	25	80.6	104	85.2	
Do you get credit from other micro finance	Yes	83	91.2	27	87.1	110	90.2	0.4
	No	8	8.8	4	12.9	12	9.8	

Source: Computed from the field survey data (2016). *** represent 1% level of significance.

This shows that, members who did not participate in output marketing had got other marketing agents around their area at a distance less than the cooperatives. Moreover, the analysis of the study indicated that, there was no statistically significant difference between participants and non-participant members' perception on price of fertilizer, amount of income from nonfarm activities and getting credit from financial institutions.

4.2. Econometric Model Results
4.2.1. Determinants of Participation in Output Marketing

Results of the Tobit model analysis showed that, out of thirteen independent variables, seven are significantly affect the probability of participation and the level of participation in agricultural output marketing through cooperatives. The estimates of parameters of the variables expected to influence the probability of participation and the level of participation in output marketing through cooperatives are displayed in Table 4.

Table-4. Maximum likelihood estimates of Tobit model.

Explanatory variable	Estimated coefficient	Standard error
Constant	3629.685	2104.417
EDUCATION	164.5296	108.8391
FAMILYSIZE	-616.8193***	124.4228
FARMSIZE	1162.927***	418.1619
TLSH	18.10645	56.0165
MEMBERSHIP	103.5539*	52.64009
DCFR	-5.12523	18.70777
SEEDUSED	9.395689**	4.658823
FERTILIZERPRI	-878.7167	826.9185
OUTPUTPROD	30.80134**	13.64536
OUTPUTPRI	1533.971**	646.1431
OMARKAG	-1475.492***	488.7365
NONFARMI	-365.2133	666.7233
CREDIT	220.4422	821.9994
Sigma	2412.507	189.4835

Log Likelihood function = -865.06681 Number of observations = 122, ***, **, * represent 1%, 5% and 10% level of significance, respectively. **Source:** Model output (2016).

4.2.2. Effects of Changes in the Significant Explanatory Variables

Results of the Tobit model were used to assess the effects of changes in the explanatory variables in to probability of participation and level of participation in marketing of output through cooperatives. The effect of marginal changes (derivatives) in significant explanatory variables on the probability of participation and the level of participation in output marketing through cooperatives are presented in Table 5.

Table-5. Marginal effects of explanatory variables.

Variable	Change in probability of participation	Standard error	Change in level of participation	Standard error	Change in dependent variable	Standard error
EDUCATION	0.0059	0.00419	136.94	91.109	157.79	104.52
FAMILYSIZE	-0.0225***	0.00765	-513.38***	103.63	-591.56***	118.54
FARMSIZE	0.0423***	0.01879	967.9***	350.2	1115.31***	401
TLSH	0.0007	0.00205	15.07	46.614	17.36	53.72
MEMBERSHIP	0.0038*	0.00215	86.19*	43.931	99.31*	50.48
DCFH	-0.0002	0.00068	-4.27	15.58	-4.91	17.945
SEEDUSED	0.0003**	0.00019	7.82**	3.89539	9.01**	4.46982
FERTILIZERPRI	-0.0247	0.01888	-759.09	738.57	-852.23	809.25
OUTPUTPROD	0.0011**	0.00057	25.63**	11.428	29.54**	13.095
OUTPUTPRI	0.0499**	0.02353	1300.88**	558.56	1478.84**	623.98
OMARKAG	-0.0531**	0.02273	-1232.68***	409.38	-1414.85***	466.65
NONFARMI	-0.0146	0.02941	-299.33	537.57	-348.41	632.29
CREDIT	0.0086	0.034	181.57	669.81	210.67	782.63

***, **, * represent 1%, 5% and 10% level of significance, respectively.

4.2.3. Discussion

Family size (FAMILYSIZE): Increasing family size on limited resource (land) obviously bring economic pressure on the household. Larger family consumes more of what are produced and little remains to be marketed. The results of the econometric model indicated that, an increase in the family member of a

household by one adult equivalent (AE) decreases the probability of participation by 2.25% and the expected level of participation among participants by Birr 513.38 (23.68$). Furthermore, it decreases the expected monetary value of output marketed through the cooperative by Birr 591.56 (27.28). This result supports the hypotheses.

Farm size (FARMSIZE): The study confirmed that members with larger farm size use cooperatives to market their output than those with smaller farm size. An increase in the farm size by one hectare of extra land owned by the household increases the probability of participation by 4.23% and the expected level of participation among participants by Birr 967.90 (44.64$). Besides, it increases the expected monetary value of output marketed through the cooperative by Birr 1,115.31 (51.44$). This result supports the hypotheses.

Years of membership (MEMBERSHIP): Farmers having longer years of membership are in a better position to know the benefits of cooperatives and market their output through these enterprises. A unit increase in the number of years since a farmer has been member of the cooperative increases the probability of participation by 0.38% and the expected level of participation among participants by Birr 86.19 (3.97$). Moreover, it increases the expected monetary value of output marketed through the cooperative by Birr 99.31 (4.58). This result also supports the hypotheses.

Amount of improved seeds used (SEEDUSED): Increment in the amount of improved seed used increases the monetary value of output marketed through cooperatives. An increase in one kilogram of improved seed that a member used increases the probability of participation by 0.03% and the expected level of participation among participants by Birr 7.82 (0.36$). In addition, it increases the expected monetary value of output marketed through the cooperative by Birr 9.01 (0.42$). This change was very small as compared to the changes resulting from other significant variables. This result also supports the hypotheses.

Output produced (OUTPUTPROD): Results of the study revealed that, the higher the output a farmer obtained, the higher would be the monetary value of output marketed through the cooperative. A unit increase in one quintal of output increases the probability of participation by 0.11% and the expected level of participation among participants by Birr 25.63 (1.18$). As well, it increases the expected monetary value of output marketed through the cooperative by Birr 29.54 (1.36$). This result also supports the hypotheses.

Member's perception on cooperative price for agricultural outputs (OUTPUTPRI): Hypotheses of the study indicated that, if members perceived the cooperative offers competitive price for agricultural outputs in the area, they will sell their outputs through the cooperative. Based on that, results of the study supports this hypotheses. Members' positive perception about the cooperatives output price increases the probability of participation by 4.99% and the expected level of participation among participants by Birr 1,300.88 (60$). Furthermore, it increases the expected monetary value of output marketed through the cooperative by Birr 1,478.84 (68.21$).

Availability of other marketing agents (OMARKAG): Members that have access to other marketing agents, which are purchasing agricultural output, around their area at a distance less than the cooperative, may not use the cooperative as their marketing agent for their output. Having other marketing agents, which are doing similar activity (purchasing agricultural output); in the area of a member at a distance less than the cooperative decreases the probability of participation by 5.31%. Besides, it decreases the expected monetary value of output marketed through the cooperative by Birr 1,414.85 (65.26$). This result also supports the hypotheses.

4.3. Major Constraints of Agricultural Cooperatives

Major constraints of agricultural cooperatives in performing agricultural output marketing activity are ranked by cooperative members in their order of importance. Based on that, the first ten major constraints of agricultural cooperatives in performing agricultural output marketing activity in the study area are: lack of equal opportunity of members in passing decisions (45.2%), inefficient cooperatives employee (45.1%), low price of production (44.4%), inadequate and under qualified management committee members (43.9%), high cost of production (42.6%), poor cooperative financial management (42.5%), existence of other competitors (42.3%), lack of transparency and accountability of management committee (41.6%), inadequate internal capital (41.1%) and lack of members' confidence on their cooperative (40.5%).

5. Conclusions

The cooperatives were performing well in output marketing by collaborating with different stakeholders. Most of the identified linkages were strong especially for the provision of technical support, market information, credit and material support.

Results of the Tobit model revealed that: family size, farm size, years of membership, amount of improved seed used, output produced, perception of members on cooperatives price for agricultural output and availability of other marketing agents, were found to be significantly related to the level of participation of cooperative members in agricultural output marketing through cooperatives. Among these significant variables farm size, years of membership, amount of improved seed used, output produced and members' perception on cooperatives price for agricultural outputs were found to be significantly and positively related to the level of participation. On the contrary, family size and availability of other marketing agents were found

to be negatively significant. However, the other variables: education level of the household head, non-farm income, total livestock holdings, credit, members' perception on price of inorganic fertilizer and distance of the cooperatives offices from farmers' residence are not significant as expected.

Output produced and amount of improved seed used were positive determinant factors of members' participation in output marketing through cooperatives. Therefore, policies that would improve agricultural output production capacity by introducing and implementing new agricultural innovation systems must get high priority by the respective stakeholders. To this end strengthening agricultural extension system in the country in general and in the district in particular has paramount importance.

Results of the study suggested that, perception of members on cooperative price for agricultural output was an important variable and significantly influencing participation of members in output marketing through cooperative. To this end the respective cooperatives should provide a competitive price for members' product and teach members about the possible additional benefit they will get as dividend, if they sale their outputs to cooperatives. Moreover, results of the study showed that, the most important variable significantly and negatively influencing the decision of members to participate in output marketing is, availability of other marketing agents in the area of members' at a distance less than the distance of the cooperatives output collection centres. Hence, the respective cooperatives should expand or establish a fixed and/or satellite output collection centres closer to members' home.

Lack of equal opportunity of members in passing decision, inefficient staff members of cooperatives, inadequate and under qualified management committee members of the cooperatives are considered as the major constraints of agricultural cooperatives to achieve their goal. Hence, to this end the respective governmental organizations, non-governmental organizations and other key stakeholders need to give emphasis in improving the organizational and institutional capacity of cooperatives.

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Appendixes

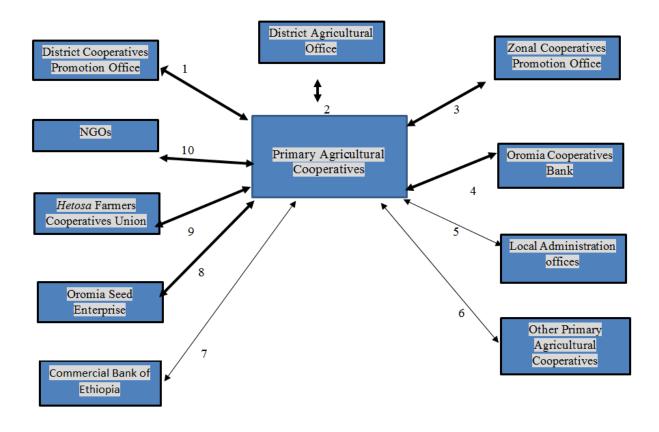**Appendix-1.** Conversion factors used to calculate adult equivalent (AE).

Age	Female	Male
<10	0.6	0.6
10-13	0.8	0.9
>13	0.75	1

Source: Storck, Berhanu, Bezabih, Borowiecki, and Shimelis (1991).

Appendix-2. Conversion factors used to estimate tropical livestock unit (TLU).

Livestock Type	TLU (Tropical Livestock Unit)
Calf	0.2
Weaned Calf	0.34
Heifer	0.75
Cows/Oxen	1
Horse/Mule	1.1
Donkey	0.7
Donkey (Young)	0.35
Sheep/Goat	0.13
Sheep/Goat (Young)	0.06
Camel	1.25
Chicken	0.013

Source: Storck et al. (1991).

Appendix-3. Actors Linkage Map.