

*Full Length Research Paper*

# Why some rural people become members of agricultural cooperatives while others do not

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Though agricultural cooperatives are considered as a basis for household food security, there are many rural people in Tigray (Ethiopia) who do not so far become members. The study explores why some rural people become member of cooperatives while others do not using group discussion, household survey and probit model. The result of the study shows the prominent variables that strongly and significantly induce rural people to join agricultural cooperatives are being male household head, member in rural associations, attending public meeting and/or workshop; membership in *TABIA/WOREDA* administrating committees; accessibility to credit services, exposure visits and training access; number of family sizes, family members in secondary school, and information access. Therefore, intensive awareness enhancement initiatives should be done in rural areas so that more people become members of agricultural cooperatives and ensure their sustainable food security, and contributes their parts in the development endeavor of the region.

**Key words:** Agricultural cooperative, membership and participation.

## INTRODUCTION AND JUSTIFICATION

In Tigray region, the agriculture sector contributes 53.3% of regional GDP, 47.6% of government taxation revenue, and 83% of the employment opportunities (Fitsum and Holden, 2002). The sector also forms a basis for the expansion of industrial sectors by providing inputs and creating niche market (Mengisteab, 1990). Despite the vital contributions, the sector has still remained in rudimentary stage. To put it differently, the yield and productivity of the sector is very low and susceptible to fluctuations due to highly dependence on family labor, backward technologies, and unpredictable natural factors such as rainfall, soil fertility pests and (Fitsum, 2003).

This low production of agricultural sector has led to frequent food insecurity problem in the region. So as to solve the problem, the regional government has given due consideration to the sector (for instance, regional strategy is conservation-based agricultural development led industrialization), especially agricultural cooperatives, as part and parcel of agricultural sector. Agriculture cooperative society, which is a voluntary association among the rural people to solve common farm problems and broaden their livelihood options to ensure food security, has the following basic principles: spontaneity, universality, neutrality, mutuality, democracy, autonomy,

homogeneity, equity and frugality (Krishnaswami and Kulandaiswamy, 2000). In the UN report, cooperative societies are also defined as voluntary association among the rural people to solve their common agricultural problems together (UN Report, 1984)

Gertler also defined cooperative societies as an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a joint-owned and democratically controlled enterprise. He added that cooperatives are based on the values of self-help, self-responsibility, democracy, equality and solidarity (2001). Cooperative societies in Ethiopia are also based on honesty, self-responsibility, democracy, voluntarily, universality, openness, solidarity and equity principles (Ethiopian Constitution and Ethiopia Cooperative Proclamation no. 147/1998) that is, membership of a cooperative society shall be voluntary. It shall be available without artificial restriction. Its main purpose shall also to serve its members, not to make excessive profit. The success of cooperatives largely depends on their values of universality, voluntary, self-and social-responsibility, democracy and openness norms.

In addition to the values and principles of cooperatives,

many researches have been conducted on wide varieties of issues relating to the importance of cooperative societies. Veerakumaran (2005) explained that cooperatives serve as fundamental tool for sustainable food security achievement at household level. Cooperatives are the best institutional intervention for attaining food security in any country. The developed nations like United States of America, Canada, Australia, almost all European countries and Socialist country like China have attained food self sufficiency through cooperatives because they are playing a crucial role in attaining food security through the provision of agriculture input and output marketing, facilitating irrigation for crop production, value addition, creation of employment, the establishment of small and micro enterprises

Gertler (2001) also explained that cooperative societies are practical vehicles for cooperation and collective action as well as they build and reinforce community, which are crucial to sustainable development. They also help to stabilize regional economies and provide a favorable climate for further investment. Cooperatives reduce inequality and promote equitable sharing of the costs and benefits of sustainable development. Cooperatives can promote economic democracy and the empowerment of marginalized groups- a hallmark of sustainable development and a precondition for shared responsibility. He concluded that cooperative societies are appropriate organizational vehicles for sustainable development of a country.

Zeuli made study on the role of agricultural cooperatives in employment creation using the social accounting matrix in the rural areas of Wisconsin state through cross section data. His result shows that 798 cooperatives have generated 17413 fulltime and 60211 part-time job seeker persons in the state as cashier, accountant, storekeeper and guard. He concluded that cooperatives are great tools for unemployment problem reduction in the country (Zeuli et al., 2002).

Using 1996 and 2001 year panel data, input-output model and parameters (e.g., revenue, number of employees and expenses), and Coon and Leistritz made a study in Minnesota that covers 337 cooperatives - 57.6% were agricultural cooperatives. The result shows that they have provided 9078 direct jobs and 42290 secondary (induced) jobs. As a result, their livelihood has grown by about 1.2% per annum. They concluded that cooperatives have vitally solved income shortage and unemployment problem (2001).

Merrett and Walzer (2001) have also conducted a study in the same state. They said that cooperatives have induced the expansion of locally based businesses, which are basis to generate huge job opportunities. They have also provided local communities integrated benefit through the provision of commodities at reasonable price and right time, which indicates cooperatives are operative-effective tool to meet challenge of market failure. They concluded that agricultural cooperatives are the foundation of better life in rural community of Minnesota

through imperative contribution to employment opportunity, livelihood progress and food security at household level.

Considering the above and other cooperative societies related empirical studies, the regional government jointly with other organizations has encouraged rural people to join into agricultural cooperative societies by providing technical and financial supports in order to solve their food insecurity problem. When cooperatives become strong and powerful technically, economically and politically, every rural people will join and then improve its livelihood. Many people have started to join agricultural cooperatives to benefit the financial, technical and material advantages that the regional government provides for those who join agricultural cooperatives.

Though the cooperatives are basis for poverty reduction at household level and the government provides various incentives and encouragements, there are still some rural people who do not want to join agricultural cooperatives. No studies of cooperative societies have investigated the factors that influence people to join cooperatives. In order to induce more people to join cooperatives and achieve sustainable food security and improve their livelihood, this study identifies the determinant factors that motivate rural people to join into agricultural cooperatives in the region. To meet the objectives, relevant data was gathered using questionnaire, group discussion and desktop reviews, and then analyzing the data using probit econometrics analyses.

## METHODOLOGY OF THE STUDY

The present study is conducted in Tigray region (Ethiopia) where it is located in the Sudano-Sahelian dry land and extends from 12° to 15° Northern latitude and 36°30' to 41°30' Eastern longitude (Fitsum et al., 1999). It has a common boundary with Amhara region, Afar region, Eritrea and the Sudan in the South, East, North and West, respectively. It has six administrative zones, 81 *woredas* (districts), 1089 *tabias* (villages), about 3500 *Kushets* (Sub-villages) and 74 towns (Wikipedia, 2007; Bhatta, 2004).

For this study purpose, one *woreda* from each zone; two target *tabias* from each *woreda*, one *kushet* from each *tabia*, and 400 sample households (200 members and 200 non-members) from the 12 *kushets* were selected using simple over stratified sampling method, because of huge financial and longtime requirement, the study also selected three (irrigation, multipurpose and beekeeping) among the various types of agricultural cooperatives in the region using number of members, number of employees, total capital budget and *kushet* level distribution criteria.

To gather valid data, the study employed different data collection methods: key informant interview, group discussion, household survey and desktop survey. For household survey, after the checklists were initially formulated; informal discussion was made with representative members and cooperative leaders; and pilot survey was made by five randomly selected respondents aim to determine the ability of the respondents in answering the questions and test the adequacy of the questions, formal questionnaire was developed by dropping questions which was redundant and adding questions which were more useful for the study, and distributed them to the sample households.

The study again made detail group discussion with 45 informants

(representatives from cooperatives societies) to collect unknown facts, and the inner feeling and view of the respondents, which were impossible to extract through questionnaire, which restricts the freedom of the respondents. Moreover, various secondary materials were reviewed aiming at evaluating differences and similarities between this study and the previous study. After properly coding, editing and processing the fieldwork raw data, it was analyzed and interpreted using descriptive statistics and probit model analysis.

**Cooperative participation econometric model**

The study uses both quantitative and qualitative data as well as cross-sectional data to estimate the cooperative participation model. The explanatory variables of the study are household characteristics, infrastructure services access, rural asset resources, village variables, institution services access (market, training, and credit) and information access. The dependent variable is participation (become member) in agricultural cooperatives. It has two possible options: participate (member) or not-participate (not- member) in the cooperative. This model is expressed as:

$$E(Y_i | X_i) = F(X_i \beta_i) \Rightarrow Y_i = \sum_{i=1}^N \beta_i X_i + \epsilon \approx NID(0, \sigma^2) \quad i = 1, 2, 3, \dots, N \quad (1)$$

Where, the vector “Y” is the explained variable; “X<sub>i</sub>” is the vector of all observed explanatory variables captured in the model; “β<sub>i</sub>” is the vector of the coefficient of the model; ε is the error term (random disturbance) where it is assumed to be normally and identically distributed with mean zero and constant variance, and captures all unobserved explanatory variables that are not captured in this model; and *i* indexes (*i* = 1, 2, 3...) represents households who participate in the cooperatives.

The nature of the dependent variable does not allow using OLS regression model because it has two values, which bids the error term to have two possible outcomes. The implied model of the conditional mean places inappropriate restrictions on the residuals of the model though the fitted value of the dependent from the simple linear regression has not restricted to lie (0, 1). It is not also continuous as is assumed in OLS model, which enables the error term to have non-normal distribution and suffer from heteroscedasticity (Wooldridge, 2000).

For this reason, the study has used the appropriate binary probit choice model to explore the cooperative participation model. It has assigned one for those households who have already joined agricultural cooperative societies but zero for those individuals who have not yet become member of agricultural cooperatives. Equation 1 is depicted using the probit model as follows:

$$Pr_{OB}(Y = 1 | X) = \varphi(\beta, X) + \epsilon \approx NID(0, \sigma^2) \quad (2)$$

Where, φ represents the cumulative distribution function of the standard normal distribution. This probability model assumed that all variables that are not captured by the model are normally and identically distributed with zero mean and constant variance. The Probit model is bounded within the value of [0, 1]. Equation 2 can be expressed as:

$$Y = \begin{cases} 1 & \text{IF } Y > 0 \\ 0 & \text{OTHERWISE} \end{cases} \Leftrightarrow Pr_{OB}(Y_i = 1) = 1 - Pr_{OB}(Y_i = 0)$$

$$Pr_{OB}(Y_i = 1) = 1 - \varphi\left(\sum_{i=1}^I \beta_i X_i + \epsilon\right) \text{ OR } Pr_{OB}(Y_i = 1) = L(M) = \sum_{i=1}^I \beta_i X_i + \epsilon \quad (3)$$

The probability of rural people to become member of the cooperatives depends upon regressor variables. This specified model enables it to estimate the parameters of the model of which this probability coefficient uses only to interpret the sign of the estimates. For instance, β<sub>i</sub> > 0 shows that the likelihood of the response increases with the presence of the explanatory variable, with other variables held constant, and β<sub>i</sub> < 0 suggests that the likelihood of the response to become member of cooperatives decreases with the independent variable, ceteris paribus.

However, the estimate coefficient does not show how much the explanatory variable increases or decreases with the likelihood of the response. In order to interpret the partial effect of the parameters, the study used marginal effect of the Probit Model which leads to misconception in the conclusion and prediction of the study. Verbeek (2004) stated the marginal coefficient of the Probit Model shows how much difference a unit change in the independent makes in terms of the cumulative normal probability of the dependent variable.

$$\frac{\partial(L(M))}{\partial X_i} = \frac{\partial Pr_{OB}(Y_i = 1)}{\partial X_i} = \frac{\partial(Y_i / X_i \beta)}{\partial X_i} = \frac{\partial(\sum_{i=1}^I \beta_i X_i + \epsilon)}{\partial X_i} \text{ WHERE } i = 1, 2, 3, \dots, N, \dots \dots \dots (4)$$

Where *i* = 1, 2, 3, ... *n*

This marginal effect (the elasticity coefficient) shows the additional probability of the explanatory variables upon the dependent variable. It is now possible to calculate the marginal effect of the participation model as the probability of the one explanatory variable changes, being that the other independent variables held constant. The probit model can thus be used to identify the major factors that affect the decision of the rural farmers to become member of agricultural cooperative societies.

**Socio-economic conditions and rural assets**

The descriptive result of the study shows that the male-headed households account 65% (Table 1). The age of the sampled household ranges from 20 to 76 years though the average is 44 years. 82.5% of the samples are literate, of which, 27% are with religious and literacy campaign education, 32% are with elementary school, 22% are with junior and secondary school certificate and 19% are with vocational and technical centre. 78.5% of the households do as well have special skills (carpenter, mason, craft work, pot making, weaving, hair dressing, traditional healer, and basket making).

The sizes of the household ranges from 1 to 16 (the average is 6.71). The average family dependency ratio<sup>1</sup> is 2.01 and the household consumer-worker ratio<sup>2</sup> is on average 2.64. The value of adult-labor equivalent<sup>3</sup>, which measures the contribution and

economic significance of members in the family size by adjusting for age and sex within the family, ranges from 0.5 to 13 (average is 5.26). The livestock equivalent ownership in the study area also varies from 0 to 38 TLU<sup>4</sup> but the average is 7.53 TLU.

The average farmland holding size per head is also about 3

1 Dependent (children below 18 years and elders above 60 years) households per independent households (between 18 - 60 years old)

2 The total family sizes or consumers per the adult workers in the family cell

3 According to Collinson equivalent, adult-labor equivalent is computed as adult males and females 15 to 60 years is assigned 1; males above 60 years 0.67; females above 60 years 0.6; children between 10 and 14 years 0.25; and children below 10 years are considered as insignificant contributors (Sendalo, 1995).

**Table 1.** Descriptive statistics of households' demographic and socioeconomic attributes.

Household characteristics	Obs.	Household response description
Household head age	400	Min (20), Max (76) and Mean (43.89)
Household head sex	400	Male-headed (65%) and Female-headed (35%)
Household head special skill	400	Yes, do have (78.5%) and No, do not have (21.5%)
Household head education	400	Literate (82.5%) and Illiterate (17.5%)
Family sizes	400	Min (1), Max (16) and Mean (6.71)
Adult equivalence	400	Min (0.6), Max (13) and Mean (5.26)
Dependency ratio	400	Min (0), Max (6) and Mean (2.01)
Consumer-worker ratio	400	Min (0), Max (9) and Mean (2.64)
Farmland/head/ tsimad	400	Min (0), Max (7) and Mean (2.67)
Livestock-equivalence/head	300	Min (0), Max (38) and Mean (7.53)

tsimad<sup>4</sup>, which indicates welfare difference in rural areas comes due to difference in number of farmland and animals owned.

### Membership in agricultural cooperatives

Rural associations (farmers, youth, women, etc.) are not only basis for the establishment and expansion of cooperative societies in the rural areas through experience exchanging and training to promote awareness and understanding of people about the importance of agricultural cooperatives but also to facilitate the sustainable development of a country. The result signifies that about 90% of the sampled households are member of the rural associations that are found in the region, which justifies agricultural cooperatives are characterized by a diversified groups, with basis for work commitment, cooperation work, success of teamwork and experience sharing.

The remaining 8% households are not member of any rural association. It is due to mainly old age and unwillingness but there is no restriction in the country because the Constitution of Ethiopia and the Ethiopian Cooperative Society Proclamation No. 147/1998 allow any person above 20 years to become a member of any association voluntarily. In the country, it is possible to establish open or closed cooperative society membership depending upon the type of the cooperative, the willingness of beginning members and annual budget. The former refers to membership where the door of the cooperative is opened for any individual to join while, in the later, the door is completely blocked for any individual to become member once established.

Of the total agricultural cooperatives, 92% are with opened membership on the condition that the new entrants pay share-capital (the total amount members annually contribute into the cooperative) and registration fee. The share-capital and registration fees vary among different agricultural cooperatives depending upon the annual budget, future promise, capacity and strength of the cooperatives, and numbers of members. The result shows the registration fees that a newcomer has required to pay varies from birr 37 to birr 270 while the average is birr 86.

There are two approaches to pay the share-capital amount. The first is book value per member which refers to the bank account book consisting of annual budget, member contribution, retaining earning and other financial resources received from supports. The second is fixed amount that is decided by the management committee of the cooperative. According to the study, 88% of the cooperatives requested the newcomers to pay the average book

value per member in addition to the registration fees.

The remaining 12% cooperatives have used the fixed amount approach, that is, the management committees of cooperative have decided the amount the newcomer should pay. The decision varies among cooperatives due to personal subjectivity, bargaining power of the new entrant, and capacity of the cooperative society. Though both approaches are commonly practiced in the region, book value per member approach seems preferable to the fixed approach because of absence of subjectivity and administrative convenience. There are, on the other hand, some cooperative societies (e.g. beekeeping cooperative) that adopted closed membership. The informants in the group discussion explained the reasons that their initial capital is very high. These cooperatives are also associated with high risk at the beginning but gradually become low. It is difficult to convert the risk the beginners of the cooperative have faced into monetary value to charge it for the new entrants; otherwise the newcomers would entertain benefits at the expenses of the existing members. In order to avoid free riding benefits and other inconveniences, it is better to block the door of these cooperative societies for new entrants. Households in rural areas do have different awareness on the importance of cooperative.

The result in Table 2 explains that 70% of the members have become member based on their-interest because they have developed positive attitude on cooperatives from different Medias and public meetings. They know that agricultural cooperatives are the basis for rural people to solve farm problems collectively; promote self-reliance (mutual advantages) among the diversified farmers; and achieve other advantages. The remaining 30% of the respondents have become member after a long period of persuasion by their friends and other members as well as by government trainings.

The study also explores why households join the cooperatives. The finding expresses some households have become members since they enjoy working with others and to diversify investment portfolio. Other members have joined to increase market access (bargaining power) and reduce unnecessary competition among rural farmers. Being a member, it is natural to satisfy or dissatisfied on the services receive from the agricultural cooperatives. 97% of the members are very satisfied being become member of the cooperative societies though there are few unsatisfied members because the cooperative societies remain weak and infant for long period. Because of the benefits from the cooperatives, 93% of the nonmembers do have strong desire to join agricultural cooperative in short period.

### Determinant factors for agricultural cooperatives

Naturally, rural people join agricultural cooperatives in different period of time. Why some joined at the establishment of the

<sup>4</sup> There is no scientific standard conversion factor of tsimad to hectare. Customary, however, four tsimad is considered as one hectare.

**Table 2.** Type of agricultural cooperative society's membership.

Household and informant questions	Obs.	Responses
Are you member of any rural association?	400	Yes (92%) and No (8%)
What was your level of participation in the foundation of the society?	200	High (95%), Low (2%) and Not at all (3%)
How did you decide to become member of the cooperative society?	200	Self interested (70%), by government (3%) and by others friends (27%)
Are you happy being member of the cooperative society?	200	Yes (97%) and No (3%)
What type of membership is it your cooperative society?	25	Opened membership (92%) and Closed membership (8%)
For opened membership, are number of members increase overtime?	25	Yes (100%)
How much registration fees the new entrants and the incumbents pay? (in birr)	25	Min (37), Max (270) and Mean (86.45)
Which payment types do the new entrants choose?	25	Book value (88%) and Fixed amount (12%)
Average amount so far decided by the management committee? (in birr)	25	Min (230), Max (900) and Mean (547)
Are you willing to join into agricultural cooperative society?	200	Yes (93%), No (7%)
Non-members		

cooperative while others join later? Households do have significant different perception and understanding about importance of the cooperatives, which might result from various internal and external factors that inspire them to (not to) join the agricultural cooperatives.

The probit participation model illustrates how the explanatory factors induce rural people to join the cooperative. It estimates the parameter coefficients ( $\beta$ ) and predict marginal values ( $\partial Y/\partial X$ ) of the stated model. The values in the coefficient column show the direction that is whether the explanatory variables positively or negatively affect the model. But, it does not show the magnitude of the explanatory variables, and can not be used for analysis and interpretation

The model is tested for OLS assumptions and misspecification problems so that the results in Table 3 are free of multi-collinearity, heterogeneity, endogeneity, leverage, non-normality and unusual outlier problems. The result discloses male household head, member in rural associations; rate of participation in public meetings; member of *tabia/woreda* leadership group; education of household head; institution access (credit, exposure visit and training); household consumer-worker ratio; population pressure in the village and number of family members in secondary school are explanatory variables that positively affect the probability of the people to join the cooperatives in the village.

On the other hand, explanatory variables that negatively induce rural people to join agricultural cooperatives are special skill, fragmented farmland, number of active-labors in the family, local market distance (market access), age of household head, farmland ownership, number of oxen the household head owned, and members of the family in primary school. The results are lined up with the expected sign. For instance, the higher the population density of the village, the smaller and the more dispersed would be the farmland holding size. Those households who do have highly dispersed and small farmland require more time to move from one plot to another to accomplish the farm activities such as plough, weed, and harvest their plots. For this reason, they do not want to join the cooperative society.

Farmers with more oxen do sharecrop-in and/or rent-in additional farmland from poor households, which makes them busy because agricultural activities demand more family labor and time. To illustrate more, suppose there are two groups (do have information like radio, TV and others access, and do not have information access). The probability of those people who do have information access to become member of agricultural cooperatives is considerably high compared to those household do not have information Medias. The

likelihood to join agricultural cooperatives in the region is very low for those households who do have more children in primary school as compared to those households who do not have (a few) children in primary schools because the formers do need more time to look after animals and treat farm activities.

The study also shows the degree of influential power that the explanatory variables do have upon the rural people to stimulate join the cooperatives. The result indicates male headed household; easy information access; being member of rural associations; family members; attending in public meetings/workshops; easy institution access (exposure visits, credit and training); family members in secondary schools; and serving in *tabia* management committee are strong and statistically significant variables to influence the likelihood of farmers to join the cooperatives at 5 and 10% level of significance.

The remaining variables, on the other hand, are classified as weak because they do have statistically insignificant impact to enlarge the probability of farmers to become member of agricultural cooperatives. For interpretation purpose, the study was computed marginal value at the mean value of the independent variables. If independent variable is changed by a unit while the other variables remain constant, the attribute of this unit change of the descriptive variables on the model examines via the marginal-probit value.

For example, the probability of the household heads to join the agricultural cooperatives increases by 11% as they actively participate in public meetings as compared to those households who do not participate in public meetings for the reason that they do get more information about cooperatives in the meetings. The probability of male-headed households to become member of the cooperatives is also 22% higher than female-headed households. Since women are busy at home; they are not allowed to work outside; they do not participate in public meeting; and they do have little participation in administration committee of *the tabia* or *woreda*.

The expected difference between being and not being member of rural associations is 0.44. The probability of rural people who are member of rural associations to join into agricultural cooperatives is about 44% higher than the probability of rural people who are not member of rural associations. The probability to become member of agricultural cooperatives falls by 8% as the household head has special skill like carpenter, traditional healer, hair dresser, driving and so forth. Because households with special skill do want to spend more time in these activities than in cooperatives as they do earn more income in these special skill activities.

In short, households do not simply join agricultural cooperative

**Table 3.** Probit model coefficient and marginal estimations for participation variables.

Participation (Y)	Coef. ( $\beta$ )	$\partial Y/\partial X$	z	P> z	[95% Conf. Interval]
Male household head	0.5722779	0.2221708	2.32	0.020	0.0889903, 1.055565
Household head with special skill	- 0.216829	- 0.0810559	- 0.75	0.452	- 0.7818396, 0.3481938
Members in rural associations	0.675619	0.4437716	4.14	0.000	0.8831933, 2.468044
Attending public meetings	0.266651	0.1045735	2.60	0.045	0.5974929, 1.130795
Members in administering committee	0.3644648	0.1378369	1.67	0.095	- 0.0637107, 0.7926403
Education of household head	0.1856318	0.0709618	0.87	0.383	- 0.2310743, 0.6023379
Access to credit	0.239261	0.0923681	0.97	0.104	- 0.2460495, 0.7245715
Access to trainings or exposure visits	0.4044554	0.1554845	1.68	0.092	- 0.0661742, 0.8750849
Fragmented farmland/head	- 0.183449	- 0.0691842	- 0.74	0.460	- 0.6699364, 0.3030379
Media/information access	0.4032544	0.1550248	1.84	0.065	- 0.0257583, 0.8322672
Size of family/head	0.053983	0.0206962	1.76	0.047	0.6293673, 0.921401
Labor endowment	- 0.193786	- 0.0742941	- 0.65	0.517	- 0.779682, 0.3921109
Consumer-worker ratio	0.0064835	0.0024857	0.03	0.976	- 0.4073849, 0.4203518
access to market	- 0.105454	- 0.0406046	- 0.46	0.643	- 0.5517882, 0.3408801
Infrastructure service existence	0.2563464	0.0990833	1.21	0.227	- 0.1598819, 0.6725747
Age of household head	- 0.654474	- 0.2509133	- 0.40	0.687	- 3.836787, 2.527844
Population density/ kushet	- 0.00304	- 0.0011655	- 0.01	0.989	- 0.4210339, 0.4149539
Farmland ownership	- 0.150824	- 0.0567553	- 0.40	0.687	- 0.8846713, 0.5830225
Number of oxen	- 0.128170	- 0.0491383	- 0.83	0.408	- 0.4317856, 0.1754455
Livestock equivalence	0.0613687	0.0235277	1.06	0.290	- 0.052418, 0.1751553
Size of farmland/ha	0.2224702	0.0852913	0.71	0.480	- 0.3955458, 0.8404862
Family member in primary school	- 0.009015	- 0.0034561	- 0.15	0.882	- 0.1283826, 0.1103531
Family members in secondary school	0.100564	0.0385546	2.27	0.016	0.0960201, 0.2971482

Number of obs = 400; Wald chi2 (23) = 50.4; Prob > chi2 = 0.0019; Pseudo R2 = 0.8769; Log pseudo-likelihood = - 109.55141.

societies but there are motivating factors that arouse them to become member of the cooperative societies. In order to join more rural people into agricultural cooperatives and solve their common economic and social problems collectively, availabilities of infrastructure facilities in rural areas including telephone, electricity, transport, information services, schools, credit institutions and others are necessary conditions because the major difference between member and nonmember rural people is an awareness difference. It would be better if the regional government in collaboration with other concerned agencies shall exert all possible efforts in expanding these infrastructure services.

## Conclusion

The prime objective of the study was to identify the major factors that influence rural people to join agricultural cooperatives using group discussion, informant interview, household survey and probit analysis model. As the text and document analysis indicated, agricultural cooperative societies are autonomous associations of rural people united voluntarily to meet their common economic, social and cultural needs through a jointly owned and democratically controlled enterprise. The Ethiopian constitution and cooperative society proclamation No. 147/98 allow the rural people above 20 years to organize themselves in group and establish cooperatives so as to solve their farm-related problems and improve their livelihoods.

Becoming member of agricultural cooperative societies depends not only on the personal interests of the rural people but also on other additional factors that motivate them to become member of agricultural cooperatives. That is why some people become member while others do not. Had been the determinant factors only self-interests, all rural people would have become member of agricultural cooperatives because cooperatives are the basis to achieve food security at household level. Findings of the study showed that the major determinant factors that influence rural people to join farm cooperatives vary from the households characteristics to institutional factors.

Male household head, member in rural associations, frequency of participation in public meetings, serving as member in *woreda (tabia)* leadership committees, access to credit institution and training, size of family per head, number of family member in secondary school, and availability of information tools (TV, radio) are some variables that strongly and statistically significantly encourage rural people to become member of agricultural cooperatives. Special skills and education of household head, fragmented farmland, members of the family in primary school, livestock and farmland resources, market access, infrastructure services, and household consumer - worker ratio are explanatory variables that weekly

affect rural people to join cooperative societies.

For instance, the expected mean difference of information access is 16%. The expected mean difference (two members of the family equals mean) of members of the household head in secondary schools is 4%. Trainings (exposure visits) mean difference among households is 16%. In other words, households with easy access to information (TV or radio) do have higher probability, 16%, than households with no access to information to become member of agricultural cooperatives. As the household becomes a member of *tabia/woreda* administrating committees the probability of the household to join into agricultural cooperatives increases by 14%. Besides, household head with more children (more than two) in secondary school increases its interest to become member of agricultural cooperatives by 4%.

Participation on public meetings/workshops, trainings, and exposure visits does have significant influence as these activities enhance the awareness of the rural people on the importance of cooperative societies. The size of the family also highly affects household head to join into the cooperatives. The mean difference of the family sizes (4 as base members) is 2%. This means household heads with more than four members do have 2% higher likelihood than household heads with less than four members to become member of agricultural cooperatives. The other explanatory variables do have considerable influence on the model though the impact is not statistically insignificant given the 10% level of significance.

In order for more rural people to become member of agricultural cooperatives and then ensure sustainable food security and relieve from absolute poverty at household level, regional government in corroboration with other concerned bodies should expand (introduce) awareness creation initiatives such as provision of intensive trainings, and organization of awareness promoter public meetings, discussion and workshops as well as expand information infrastructure services such as telecommunication, electricity, schools, and transport to rural areas of the region.

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