

DETERMINANTS OF CO-OPERATIVES MEMBERS' PARTICIPATION IN INPUT AND OUTPUT MARKETING BY MULTIPURPOSE CO-OPERATIVES - AN EMPIRICAL ANALYSIS IN TIGRAY REGION, ETHIOPIA

R. Karunakaran, Brehanu Borji & Ahmedin Sherefa

Hawassa University, Ethiopia

ABSTRACT

The main aim of this study is to empirically analyze the major factors influencing members' participation in input and output marketing of agricultural multipurpose co-operatives in the Southern Zone of Tigray Region of Ethiopia. A multi-stage random sampling procedure was adopted as to selection of Woredas, co-operative societies, and member respondents. As such, in the first stage, Tigray Region was purposively selected. In the second stage, from the five Woredas (Districts) of the Southern Zone of Tigray Region, Alamata and Ofra Woredas were selected at random for the study. In the third stage, out of 27 primary multipurpose co-operatives in the selected Woredas, 10 societies were selected based on the volume of business. In the final stage, a total of 208 sample respondents at the rate of 56 from Alamata and 152 from Ofra Woreda by adopting probability proportionate to size sampling. Primary data pertaining to the year 2007/08 was collected from the selected sample respondents by using a structured interview schedule. Of the total respondents, about 70.2% and 29.8% were participants and non-participants of the co-operatives agricultural input and output marketing respectively. Probit econometric model was employed to identify the determinants of participation of co-operative members in the input and output marketing by co-operatives in the two Woreda. Fifteen explanatory variables were included in the model of which ten variables were found to be significant. Of these, six explanatory variables namely own land, shareholding, distance, output price, membership in other co-operatives and seed price were found to be significantly and positively related to the participation of co-operative members in the agricultural input and output marketing by co-operatives.

INTRODUCTION

Currently, there are around 28,000 primary level co-operatives (60 percent are agricultural co-operatives) 180 secondary co-operatives (unions), two co-operative federations and a Co-operative Bank with 16 branches operating throughout Ethiopia

servicing more than 5 million members with a total capital of over 1.2 billion Ethiopian Birr in different sectors of the economy like Agriculture, Banking, Credit and Savings, Marketing, Processing, Construction, Service, Housing, Irrigation, Agriculture. etc (*Federal Co-operative Agency 2010*). It is noteworthy that more than 85 percent of the total agricultural inputs requirements of the rural community are distributed through co-operatives. As to market share, co-operatives are responsible for over 25 percent of coffee exports, the major foreign exchange earner of the country. Coffee unions are exporting high-quality, organic and Fair Trade coffee to the United States, Europe and Japan, fetching premium prices on behalf of smallholder coffee farmers. Through co-operative unions, primary co-operatives have unfettered access to inputs at competitive prices with substantial price reductions) and have attained a strong bargaining position in marketing their outputs.

A report of Tigray Co-operative Promotion and Input Marketing Division (2008) indicates that there are 1309 different types of primary and 21 secondary co-operative societies in the region, of which 582 (44.5%) are agricultural multipurpose co-operatives which deal with the input and output marketing of their members. The remaining 727 (55.5%) co-operatives comprise of saving and credit, construction, irrigation and other type of co-operative societies. The co-operative societies in the region have a total membership of 361,242 which includes 275,696 (76.3%) male and 85, 546 (23.7%) female members with a total capital of Birr 71,462,247 (*Gebru Desta, 2007*).

The marketing of agricultural products begin at the farm when the farmer plans his production to meet specific demands and markets prospects. Marketing enables the agricultural producer to step out of a subsistence straight jacket and grow produce for sale. Correspondingly, it permits a large proportion of a country's population to live in cities and buy their food nearby. Agricultural marketing provides an incentive to farmers to grow produce for export. In this way, it gives farmers more income and earns foreign exchange to pay for imports. Agricultural marketing is complicated by the diverse nature of the products to be handled, and their perishability. A further complication is the scattered nature of agricultural production and, in most tropical countries (like Ethiopia), the very large number of separate production units. For these reasons, agricultural marketing calls for considerable initiative, decision making and skill (*Kraenzle, 1989*).

Co-operative Marketing is an extension of the principles of co-operatives in the field of marketing. It is a process of marketing through a co-operative association formed voluntarily by its members to perform one or more marketing functions in respect of their produce.

Agricultural inputs can be categorized into two types, consumable and capital inputs. The former includes manures and fertilizers, seeds, insecticides/pesticides, diesel oil and electricity, etc, on the other hand, capital inputs include tractors and trailers, harvesters and threshers, pump sets, and other implements. Most of the agricultural input markets are seen at the level of grain market towns and large villages or co-operative institutions. There are some general aspects of the rural market like underdeveloped markets, illiterate buyers, lack of communication facilities, many languages, and vast spread of the market, storage, transport problems, seasonality and demand which are applicable to agricultural input markets as well. However, agricultural input markets differ from other product markets in many ways due to the nature of their products, the nature and location of users and the overall environment in which products are being bought and used (*Oxford Policy Management, 2003*).

Under the current institutional arrangement, the Ministry of Agriculture and Rural Development (MoARD) is responsible to design, implement and monitor agricultural marketing policies through the different divisions organized under the department of agricultural marketing and inputs of the Ministry. Other organizations like co-operatives, unions, traders associations, exporters' associations etc also play an important role in improving the marketing skill, bargaining power and also in the process of policy formulation (*Dawit, 2005*).

Statement of the Problem

The weak performance of the agricultural markets (both input and output markets) in Ethiopia has been portrayed in various studies as a major impediment to growth in the agricultural sector and the overall economy (*Dawit, 2005*). With an inefficient marketing system, the surplus resulting from increased production benefits neither the farmers nor the country (*Hind, 1994*). This is particularly important as the country is following a policy of agriculture led-industrialization and economic development where the agricultural sector is expected to produce surplus that can move to the other sectors of the economy.

The agricultural markets in Ethiopia are highly influenced by the production system itself. Most of the agricultural production is undertaken by small scale producers scattered all over the country, engaged in different agricultural enterprises without specialization, and with limited marketable surplus. It was estimated that only 28 percent of total farm output in 1996 was marketed. Therefore, the scattered produce in small quantity needs to be collected and assembled, graded, and transported from one market level to another. Thus, the marketing system is characterized with a long chain with many intermediaries. An intervention is required to shorten the marketing

channel in order to reduce the marketing costs incurred at each level of marketing channel so that the benefits will go to the farmers (*Gebremeskel, 1998*).

The cause of success and failures of co-operatives corresponds in a building up and breaking down of co-operative identities through the process by which members and employees grow to hold the identity as their own vision. Although co-operatives are considered as an appropriate tool of rural development they are facing critical problems, which retain them from their positive role. Some of the constraints of co-operatives are: low institutional capacity, inadequate qualified personnel, low entrepreneurship skill, lack of financial resources, lack of market information, poor members' participation in the different activities such as financing the co-operative, patronizing the business activities of the co-operatives, control and supports it. Moreover, the prices of agricultural inputs are increasing from year to year and farmers are complaining on it. These multifaceted problems make very difficult the over all activities of the co-operatives in general and the agricultural input and output marketing in particular. Among the problems discussed above, members' participation assumes greater significance since members' participation is being considered as a prime factor which influences greatly on the input and output marketing system of marketing co-operatives. Thus the present study is an attempt to bring forth the factors influencing members' participation in input and output marketing by co-operatives in Southern Zone of Tigray.

LITERATURE REVIEW

Participation of members in the agricultural input and output marketing by co-operatives: For the effective functioning of the co-operative movement, members' participation is the pole of the co-operative. These are members who are aware of the importance of the co-operative societies socially and economically. These members will make themselves aware of the problems and have the willingness to contribute to the progress of the co-operatives. Such membership ensures member participation in the business and managerial affairs of the co-operatives. Vigilant members prevent financial irregularities and the emergence of vested interest in co-operatives. Thus the health of co-operatives improves. As against the participant members, ignorant, sleepy, inactive, non-participative and indifferent members become a problem in themselves. They are prone to exploitation by the convert (change) elements in the society. So the members in the society must be highly participative in all aspects of the co-operative affairs.

Democracy is the basic value of co-operatives. In a democratic organization like co-operatives, the general body is supreme organ of the organization and the management committee is elected by them to look after the day to day affairs. In this study, the concept of participation lays the involvement of member patrons in patronizing the agricultural input and output marketing made by co-operatives. A few studies pertaining to members' perception, attitude and participation in co-operatives have been reviewed hereunder.

Mitchell A. Seligson (1987) in his report analyzed the Attitude and Perception of Co-operative Members and Nonmembers on the advantages and disadvantages of co-operatives. The study concluded that members of co-operatives have better positive attitude and perception towards the management and administration of co-operatives because of their active participation in both management and business affairs. Further non members too have some knowledge about co-operatives.

Tretcher (1996) used a logit regression analysis to analyze the factors associated with diversification on agricultural co-operatives in Wisconsin. It was found that the impact of diversification upon measures of co-operative performance (profitability, patronage refund and equity redemption) was relatively minor i.e. diversification on agricultural co-operatives was not statistically associated with profitability, increases in patronage dividends or increases in equity devolvement. The result also showed that diversification on agricultural co-operatives was an important factor in determining membership size i.e. diversified co-operatives enjoyed larger membership.

Haileselassie (2003) found that most of the co-operative members appreciated the involvement of co-operatives in input marketing. As a result members in the Saeisetsaeda Emba Woreda in Tigray Region have built a sense of ownership and confidence. The study further indicated that above all members were satisfied for the reason that it removed the need for members moving along distances to collect fertilizer, and reduced time and finance spent on the way.

Kebede (2006) used the logit model to analyze the farmers' perception and determinants of land management practices in Oflla Woreda, southern Tigray, Ethiopia. The findings of the study showed that Age, Sex, Distance to *Woreda* market, perceived water logging problem, perceived gully and degradation status, Investment in soil and water conservation practices, slope category were found to determine the farmers perception of land management practice.

Daniel (2006) used the tobit model to assess the performance of primary agricultural co-operatives and determinants of members' decision to use as marketing agent in Adaa Liben and Lume Districts. The findings of the study showed that among these significant variables, co-operative price for teff, position in the co-operative, farm size, yield of teff, patronage refund and distance of the district market from the farmer's house were found to be significantly and positively related to the farmers' marketing of teff through the co-operatives.

Gebru Desta (2007) in his study *Competitive Advantage of Agricultural Co-operatives' Services in Rural Areas of Tigray* observed that agricultural co-operatives are legitimate institutions which belong to farmers. Their main activities are to render variety of services and access the market for input supply particularly to the rural community. The result of the survey further states that the trend of agricultural inputs supply in the study area is highly decreased in quantity of fertilizer, improved seeds and increased unit price almost from year to year.

Amini and Ramezani (2008) investigated the factors involved in the success of poultry growers' co-operatives in the selected provinces of Iran. The results indicate that the co-operatives studied have generally failed to achieve the objectives mandated in their constitutions which include their members' satisfaction. The results from path analysis showed that the following factors, in descending order of importance, had the greatest effects on co-operative success: managers' technical skills, number of training programmes attended, quality of training programmes offered, members' participation in co-operatives' administrative affairs and managers' interpersonal human skills.

The studies reviewed so far have not analyzed the role of co-operatives in input and output marketing in the study area in particular and Ethiopia in general and hence the present study.

Research Questions

The research work is an attempt to find answers to the following questions.

1. Do members actively participate in the input and output marketing of multipurpose co-operatives?
2. Are there significant differences between the socio economic characteristics of participant and non participant members?
3. What are the factors determining members' participation in the input and output marketing by multipurpose co-operatives?

Objectives of the Study

In compliance with the research questions, the study has the following specific objectives:

1. To analyze the socio-economic characteristics of the co-operatives members.
2. To assess the nature and extent of participation of co-operative members in agricultural input and output marketing activities.
3. To identify the major factors influencing participation of co-operative members in agricultural input and output marketing activities.

Hypothesis of the Study

In line with the objectives, the following hypotheses have been framed by the researchers.

1. The participation of members of multipurpose co-operatives in input and output marketing is influenced by the shares held by the member household heads.
2. The participation of members of multipurpose co-operatives in input and output marketing is influenced by the distance to the co-operative office from the house of member household heads.
3. Educated members are evincing active participation in the input and output marketing of the co-operatives.
4. Fertilizer prices have positive influence on members' participation in the input and output marketing by co-operatives.

METHODOLOGY

The study is based on empirical analysis. Hence field survey method was adopted.

Sampling Procedure

A multi-stage random sampling procedure was adopted for the selection of region, study area and the sample farmers from the co-operatives in the two Woredas. In the first stage, Tigray region was selected purposively on the justification that the region is beset with large number of agricultural co-operatives which are dealing with input and output marketing. As a second stage, out of five Woredas (Districts) in South Tigray Zone, two Woredas (Alamata and Ofra) were randomly selected for the purpose of the study.

In the third stage, considering the total number of 27 multipurpose primary co-operatives (11 in Alamata Woreda and 16 in Oflla Woreda) as well as financial and time limitations, 10 primary multipurpose co-operatives were randomly selected from the two study woredas (four from Alamata Woreda and six from Oflla Woreda).

In the final stage, given the available resource and time at the disposal, a total of 208 farmer members (56 farmers from Alamata Woreda and 152 farmers from Oflla Woreda) were selected randomly using probability proportional to sample size (PPS).

Tools for Data Collection

Primary data was collected on age of respondents, marital status, sex of the household head, educational level, family size, family income, size of land holding, livestock ownership, duration of membership, awareness about co-operatives, contact with the co-operative leaders, participation in co-operative management, dividend payment, availability of credit, exposure to mass media, price of agricultural inputs, opinion on price of agricultural outputs, timely delivery of inputs, regular marketing service of co-operatives, distance of the house of the household head from primary multipurpose co-operative society, expenditure and other relevant variables from the sample respondents who are members of the primary multipurpose co-operatives selected for the study.

A structured interview schedule was developed to collect the needed primary data which comprised of both open ended and closed ended questions. The structured interview schedule was prepared for the purpose of conducting face-to-face interview with the respondents to elicit as much information as possible in pursuit of fulfilling the objectives of the study. The interview questions were developed by the researchers at their own by taking into account the nature of the business dealings (input and output marketing) held by the members with their co-operative society. The interview schedule was first prepared in English and translated into Tigrigna for practical field work. The interview schedule was pre-tested with 10 co-operative members before its actual administration.

Data Analysis

Descriptive statistics are important to have clear picture of the characteristics of sample units. By applying descriptive statistics one can compare and contrast different categories of sample units (farm households) with respect to the desired characteristics. In this study, descriptive statistics such as mean, standard deviation,

percentages and frequency of occurrence were used along the econometric model, to analyze the collected primary data.

Probit Model Specification

To identify the factors influencing the participation of co-operative members in the agricultural input and output marketing business, binary Probit model was employed for this study. Therefore, the determinants of participation in the agricultural input and output marketing activity were estimated using binary Probit regression model. According to Maddala (2002) Probit model is specified as:

$$I_i^* = \alpha + \delta X_i + \varepsilon$$

Where

I_i = 1 if $I_i^* > 1$, the members participate in the agricultural input and output marketing by co-operatives.

I_i = 0 if $I_i^* \leq 0$, otherwise

X_i are exogenous variables where $i = 1, 2, \dots, 15$.

X_1 = Age of household head

X_2 = Educational level of the household head

X_3 = Family size of the household head

X_4 = Land owned by the household head

X_5 = Number of oxen owned by the household head

X_6 = Livestock holding of the household head

X_7 = Share holding of the household head

X_8 = Non farm income of the household head

X_9 = Expenditure in agricultural inputs by the household head

X_{10} = Distance to the co-operative office from the home of the household

X_{11} = Perception of household head on price of agricultural output

X_{12} = Perception of the household head on change of standard of living due to joining to co-operatives

X_{13} = Membership of the household head in other co-operatives

X_{14} = Perception of the household head on Fertilizer price

X_{15} = Perception of the household head on improved seed price

δ is vector of parameters to be estimated;

α is the intercept term;

ε_{ii} are the disturbance term

The Variance Inflation Factor (VIF) was used to test for the existence of multi-collinearity between continuous explanatory variables. VIF shows how the variance of an

estimator “R” is inflated by the presence of multi-collinearity (Gujarati, 2004). If R^2 is the adjusted square of the multiple correlation coefficients that results when the explanatory variable (X_i) is regressed against all the other explanatory variables, VIF is computed as $VIF(X) = (1-R)_i^{-2}$

As the adjusted R^2 approaches 1, the VIF approaches infinity. That is as the extent of collinearity increases, the variance of the estimator increases, and in the limit it can become infinity. If there is no collinearity between independent variables, the values of VIF will approach 1. As a Rule of Thumb, values of VIF greater than 10 are often taken as a signal for the existence of multi- collinearity problem in the model (Gujarati, 2004).

Contingency coefficients were also calculated to see the degree of association between the dummy variables. They were calculated for each pair of dummy variables using contingency coefficient procedure available in Statistical Packages for Social Sciences. Contingency coefficient is a chi-square based measure of association. A value of 0.75 or more indicates a stronger relationship.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The average age of the sample farmers was about 43.2 years. The corresponding figure for the participant and non-participant farmers was about 42.4 and 45.0 years respectively. An independent sample t-test was conducted to compare the difference in mean age between participant and non participant sample respondents are statistically significant at 10% probability level of significance ($t = 1.84$) (Table 1). This indicates that more aged members do not participate in the input and output marketing activities of the co-operatives as compared with the less aged farmer members.

The average educational level of the sample households was 3.2 years of schooling. While the respective participant and non participant sample farmers average schooling is 3.5 and 2.7 years. According to the independent sample t-test, the difference mean t-test was compared between the participant and non-participant co-operative members with respect to educational level of the household head is found to be statistically significant at 10% probability level ($t = -1.8$) and the hypothesis has been accepted. This implies relatively educated member farmer members participate in the input

and output marketing activities of the co-operatives. This can be due to the fact that educated farmer members have more exposure to timely information and understand about the co-operative marketing activities as compared to less educated members.

The mean family size of the sample household in the study was found to be 6.0. The respective average family size for participant and non participant household is 6.0 and 5.9 respectively. Nonetheless, the analysis shows that, the mean difference between participants and non-participants of the agricultural input and output marketing by co-operatives with respect to family size is found to be statistically non significant ($t = -0.834$).

The average land ownership of the sample respondents were 0.67 hectare. Moreover, the corresponding figures for the participant and non-participant sample respondents' amounts 0.7 and 0.5 hectare respectively. According to the independent sample t- test conducted in this study, the difference in mean land ownership between the participant and non participant household heads is found to be significant at 10% probability level ($t = -2.48$). Therefore, from this we can conclude that the majority of the sample farmers own more than half a hectare of land which is above the Woreda average (i.e. 0.5 hectare).

The average livestock holding for the sample households as a whole is 5.62 Tropical Livestock Unit (TLU) (Table 1). The average livestock holding of participants is relatively higher (6.0) than that of non-participants (4.6). An independent sample t- test was conducted to compare the mean difference in TLU owned between participants and non-participants of the agricultural input and output marketing by co-operatives. The result shows that there is statistical significant difference between the participant and non-participant households at 5% probability level ($t = -2.38$).

More importantly the average shareholding of the whole sample farmers, participant and nonparticipant farmer members amounts 2.2, 2.3 and 1.9 respectively. An independent sample t test was analyzed to compare the mean difference between the participant and non-participant households in the agricultural input and output marketing by co-operatives and the result shows statistical significance at 1% probability level ($t = -2.99$). This indicates, majority of the sample respondents 146 (70.2%) were participating in financing their co-operative societies through investing in the form of additional share capital.

Table 1: Mean, STD, T-values Continues variables for Non-Participant and Participant Groups (N = 208)

Explanatory Variables	Non- Participant (N = 62)		Participant (N = 146)		Total (N = 208)		Sig.	t values
	Mean	Mean	Mean	Mean	Mean	Mean		
	STD	STD	STD	STD	STD	STD		
Age of HH	45.02	9.00	42.47	9.13	43.23	9.15	0.066*	1.84
Level of Education of the HH	2.73	2.79	3.53	2.85	3.29	2.85	0.063*	-1.87
Family size of HH	5.987	1.987	6.02	1.931	6.003	1.959	0.405	-0.834
Land owned by the HH	0.57	0.37	0.72	0.44	0.67	0.43	0.014**	-2.48
Number of oxen owned by the HH	1.23	1.047	1.72	1.34	1.57	1.27	0.010**	-2.58
TLU	4.59	3.47	6.06	4.31	5.622	4.12	0.018**	-2.38
Nonfarm income of the HH	3147	4776	2087	2106	2403.3	3172.7	0.098*	1.68
Expenditure on input	247	229	323	284	300.45	270.6	0.066*	-1.85
Number of share holding by the HH	1.89	0.93	2.36	1.1	2.22	1.07	0.003***	-2.99
Distance from the Co-operative office	3.52	3.10	4.43	3.71	4.16	3.56	0.090*	0.06

* Significant at 10% level of significance ** Significant at 5% level of significance

*** Significant at 1% level of significance

Factors Determining the Participation of Members in the Agricultural Input and Output Marketing by Co-operatives

The estimates of parameters of the variables expected to influence the participation of farmer members in the agricultural input and output marketing by co-operatives are displayed on Table 2. Fifteen explanatory variables of which five are dummy variables and the remaining 10 are continuous explanatory variables were taken for the analysis. The result of the probit model analysis showed that 10 variables were found to be significant. The impact of these explanatory variables on the dependent variable is discussed below. Before running the model, it is useful to look into the problem of multicollinearity among the continuous variables and verify the degree of association among the hypothesized qualitative explanatory variables. To this effect, the 10 continuous explanatory variables were checked for multicollinearity using Variance Inflation Factors (VIF) while Contingency Coefficients were used to detect

the degree of association among five qualitative (discrete) explanatory variables. According to the results, no significant problems of multicollinearity and very high degree of association were observed. Therefore, all the 15 hypothesized continuous and discrete explanatory variables were included in the model.

To start with, endogeneity was suspected in the case of perception of output price, perception of change in standard of living due to joining to the co-operatives, perception of fertilizer price and perception of improved seed price with the dependent variable participation of the household head in the agricultural input and output marketing by co-operatives as there is an increase in participation by the members in the input and output marketing due to those independent explanatory variables. On the other hand, households' decision of participation depends on the price of output, price of fertilizer, improved seeds and change on the standard of living of the household head due to the participation in the input and output marketing by co-operatives.

Age of household head (AGEHH): Analysis of binary probit model as given in Table 2 reveals that the demographic explanatory variable namely age, has negative and significance effect at 10% probability level on the participation of members in the agricultural input and output marketing by co-operatives in the two study woredas between all categories of members (participant and non-participant). This result is in contrary to the finding of Subburaj and Karunakaran on the peoples' perception on the social benefits of cooperation (Frank, 2003). This is an important finding that young co-operative members are more active participants in the agricultural input and output marketing by co-operatives. The probable reason for this could be young members might have more awareness about the benefit of co-operatives as compared to aged members.

Land owned by the HH (LANDOWN): As it was expected, landholding has positively influenced the agricultural input and output marketing activity of co-operatives which is significant at five percent probability level. Each additional hectare of land increases the probability of purchasing agricultural input from the co-operative and selling of its agricultural outputs to their co-operative. Therefore, land ownership is an important variable in the input and output marketing participation of the household head. The result of this study was similar with to the findings of Daniel, 2006, as the farm size increases, the co-operative members patronize their co-operative society by purchasing and selling agricultural input and output respectively.

Share holding of HH (SHARHOL): The variable share holding had influenced the participation of farmer members in the agricultural input and output marketing by

co-operatives positively and significant at five percent probability level as it was expected and hence the hypothesis is accepted. This implies that as the number of share holding of farmer members increases the level of participation in the co-operative affairs such as input and output marketing increases. The larger the share holding the greater will be the sense of ownership by the co-operative members which leads for more participation.

Non-farm income of the HH (NONFARNI): As expected the economic variable non-farm income has influenced the participation of agricultural input and output marketing by co-operatives negatively and significant at one percent probability level. Field survey result shows that, farmers earning high non-farm income are non participants in the agricultural input and output marketing by co-operatives because they don't involve in the farming activity since they don't have the land.

Distance of the co-operative office from the HH house (DCOFFH): This variable has influenced the participation in the agricultural input and output marketing by co-operatives positively and found to be significant at one percent probability level and hence the hypothesis has been accepted. It was expected that farmers, who are relatively nearer to the co-operative office, have the chance to participate more in the marketing activities of the co-operative. However, the model result shows that farmers who live far-away from the co-operative office have also increased their probability to participate in the agricultural input and output marketing co-operatives. This implies farmer members at relatively distant location have less alternative marketing agents as compared to those who live near the co-operative which are influenced by other private marketing agents. This result is in contrary with finding of Daniel, 2006.

Perception of the HH on the price agricultural output (OUTPP): This variable had influenced the agricultural input and output marketing of the co-operatives positively and significant at one percent probability level. These shows as the co-operative offers better price to its members agricultural produce the participation of members in selling their farm output to the co-operative increase. The result was in conformity with the finding of Daniel, 2006.

Perception of the HH on the change in standard of living due to joining a co-operative (CHSTDUCCO): The variable change in standard of living due to joining a co-operative (becomes a co-operative membership) has negative and significant at five percent probability level. Therefore, the variable change in standard of living has negative contribution to the input and output marketing by co-operatives.

Membership in other co-operatives (MOTHCOOP): Membership in other co-operatives i.e. other than the multipurpose co-operatives has positive and significance influence at 10 percent probability level in the agricultural input and output marketing by co-operatives. This implies that co-operative members who have a membership in other co-operatives have better understanding in participating in the co-operative affairs including in patronizing the co-operative business (such as input and output marketing business).

Perception of the HH on fertilizer price (FERPRICE): The variable fertilizer price influenced the participation of co-operative members in the agricultural input and output marketing by co-operatives negatively and significant at 10 percent probability level and hence the hypothesis has been rejected. This implies as the price of fertilizer increases the participation of the household head in purchasing fertilizer from the co-operative decreases.

Perception of the HH on improved seeds price (SEEDPRIC): The price of improved seed has influenced the dependent variable participation of co-operative members in the input and output marketing by co-operatives positively and significantly at 10 percent probability level which is contrary with what was expected. This implies farmer members in the two woredas participate more actively in the purchase of improved seeds as compared to other types of inputs regardless the price.

In general, the participation of farmer members in the agricultural input and output marketing by co-operatives was significantly influenced by age, own land, shareholding, non-farm income, distance of the co-operative office from the household house, output price, change in standard of living due to joining co-operative, membership in other co-operatives, price of inorganic fertilizer and price of improved seed. However, out of the 10 significant explanatory variables six of them (own land, shareholding, distance, output price, membership in other co-operatives and seed price) were influenced the participation of co-operative members in the agricultural input and output marketing by co-operatives positively and significantly at 10% probability level.

In Table 2 the last column, marginal effects of the explanatory variables on the probability of member's participation in the agricultural input and output marketing by co-operatives are also presented. As we can see from the table, a unit change in the variables household age, non-farm income, change in standard of living and price of inorganic fertilizer decreased the probability of participation of farmer members in

Table 2: Probit Regression Estimates of Determinants of Participation in Agricultural Input and Output Marketing by Co-operatives (N = 208)

Variables	Coefficient	Marginal Effect
Age of HH in years	-0.0403* (0.0150)	-0.0121* (0.0045)
Educational level of the HH in years of schooling	0.0398 (0.0437)	0.0120 (0.0131)
Family size of the HH in number	-0.0369 (0.685)	-0.0111 (0.0206)
Land owned by the HH in hectares	0.8618** (0.3385)	0.2603** (0.1013)
Number of oxen owned by HH in number	0.0401 (0.1558)	-0.0121 (0.0471)
Livestock holding of the HH in tropical livestock unit	0.0349 (0.0496)	0.0105 (0.0149)
Share holding of the HH in number of shares	0.3052** (0.1235)	0.0922** (0.0367)
Non farm income of the HH in birr	-0.0001*** (0.0000)	-0.00003*** (0.0000)
Expenditure in agricultural inputs by the HH in birr	-0.0005 (0.0004)	-0.0002 (0.00013)
Distance to the co-operative office from the home of the HH kms	0.0632** (0.0323)	0.0191** (0.0098)
Perception of the HH on price of agricultural output dummy	0.6539*** (0.2454)	0.1883*** (0.0660)
Perception of the HH on change of standard of living due to joining to co-operatives dummy	-0.5405** (0.2349)	-0.1702** (0.0758)
Membership of the HH in other co-operatives dummy	0.4155* (0.2211)	0.1251* (0.0660)
Perception of HH on fertilizer price dummy	-0.5658* (0.2912)	-0.1809* (0.0962)
Perception of HH on improved seed price dummy	0.6310** (0.2759)	0.1906** (0.0813)
Constant	0.9031 (0.6451)	
Pseudo-R2	0.2524	
LRX 2 (15)	63.98	
Prob >X2	0.000	

***, **, and * indicates statistically significant at 1 percent, 5 percent and 1 percent probability level respectively. Figures in parentheses are standard errors

the agricultural input and output marketing by co-operatives by 0.0121, 0.000035, 0.1702 and 0.1809 respectively. More importantly, one hectare of extra land owned by the household head increased the probability of participation of the household head in the agricultural input output marketing by co-operatives by 0.2603 units. Similarly, a unit change in the share holding of the household head increased the probability of participation in the agricultural input and output marketing by co-operatives by 0.0922. As clearly shown in Table 2, a one km change in the distance of the co-operative office from the house of the household head also shows an increased probability of participation in the input and output marketing by the co-operatives, which is in contrary with the findings of Daniel (2006). The plausible reasons for this is no matter with the distance farmer members prefer to do business with their co-operative society. One birr change in the price of agricultural produces marketed to the co-operative society by its members results an increase of the probability of participation in the agricultural input and output marketing by co-operatives by 0.1883 units. Similarly one birr change (lower) in the improved seed price increased the probability of participation of the co-operative members in the agricultural input and output marketing by co-operatives by 0.1906 unit and a unit change in the membership in other co-operatives increased the probability of the household head in the participation of in the input and output marketing by co-operatives by 0.1251 units.

As it has clearly shown in Table 2, the overall fit of the model has also quite well with LR chi square value of 63.98 and Prob > chi square = 0.00. The model explains 25.2% of the variations in the participation of agricultural input and output marketing by co-operatives.

CONCLUSION

From the foregoing analysis, it may be concluded that there are significant differences between the participant and non participant members in respect of age, land, tropical livestock unit, shareholding, non-farm income, expenditure in agricultural input, distance of the co-operative office from the household house, membership in other co-operatives and price of improved seed. The probit model results revealed that out of 15 explanatory variables included in probit model, six continuous and four discrete explanatory variables were found to be significant at less than or equal to 10% probability level. More specifically, these variables include age, own land, shareholding, non-farm income, distance of the co-operative office from the household house, perception of the household head on output price, perception of the household head on change in standard of living due to joining co-operative, membership in other

co-operatives, perception of the household head on price of inorganic fertilizer and price of improved seed were found to be significantly related to the participation of farmer members in the agricultural input and output marketing by co-operatives. Further, among these significant variables own land, shareholding, distance, output price, membership in other co-operatives and seed price were found to be significantly and positively related to the participation of co-operative members in the agricultural input and output marketing by co-operatives.

Policy Implications

From the outcome of the analysis of the research work, a few suggestions have been put forth to enhance the participation of members in input and output marketing:

1. Most of the participant members feel that active participation and interest of the members is a sine-qua-non of any co-operative society. It is normal that some members will not show much interest in the affairs of their co-operatives apart from contributing their share capital, but there is a general consensus that unless members are active, co-operatives cannot prosper. There is, therefore, a clamor for throwing out the inactive members.
2. People generally feel that co-operative as a movement will succeed only if there is better knowledge and understanding of co-operatives. To that end, co-operative education needs to be improved. The education component of the activities of the Regional Co-operative Promotion Agency needs to be strengthened.
3. The need for autonomy in the management of co-operatives is emphasized. The elected board of management is expected to maintain political neutrality. Participatory management decision making in co-operatives is advocated. Members of co-operatives insist on enforcing management accountability by board of management including the executive heads. With a view to establish effective and efficient board of management in co-operatives, selective voting right to members is suggested.
4. There is a growing realization that many co-operative societies fail to live up to their expectations in fulfilling their core objectives. Provision of services that are needed by majority of members of co-operatives is emphasized during the field survey. There is a demand for avoidance of delay and delivery of prompt services. Adoption of simple and flexible procedures in availing the services of co-operatives is suggested.

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AUTHORS' BACKGROUND

Dr. R. Karunakaran (1966) is currently Assistant Professor in the Department of Co-operatives, Hawassa University Ethiopia. He has 18 years of experience in teaching, research, training, extension and industry in the fields of Cooperation and Co-operative Management. He has carried out number of research studies and written related articles. He has published more than 26 research and conceptual based papers in reputed Indian and International journals. He has published research papers in the edited books viz., *Small Scale Industries-Problems*, New World through

Co-operatives and Information Technology – Its Application in Small Scale Industries. He is co-author of two books entitled, “Gender Issues in Co-operatives” and “Training and Development” and sole author of a book entitled, “Socio-Economic Impacts of Co-operative Movement in Rural Areas”. His current areas of research are Impact Assessment of Co-operatives, Functional Areas of Co-operative Management, and Co-operative Marketing.

Dr. Brehanu Borji (1959) is currently Assistant Professor in the Department of Management and Accounting, Hawassa University Ethiopia. He has 12 years of experience in teaching, research, training, extension and industry in the fields of Management and Marketing Management. He has carried out number of research studies and written related articles. He has published more than 2 research and conceptual based papers in reputed Indian and International journals. He has published research papers in the edited books viz., the Impact of liberalization on Ethiopian Cotton Textile Industry. He is a sole author of a book entitled, “Mathematics for Management. His current area of research is Impact of Liberalization on Ethiopian Leather Industry.

Mr. Ahmedin Sherefa (1972) is currently Lecturer and Head, Department of Co-operatives, Hawassa University. He has 4 years of experience in the fields of teaching, research, extension and training. Prior to his teaching assignment, he served as administrator/head in several government organizations for about 15 years. He did his M.Sc. in Co-operative Marketing in Mekkele University, Ethiopia. He had undergone short term training on Development management and Thematic PRA in reputed Indian Institutions. He has completed so far two micro research projects funded by the Research and Development Directorate of Hawassa University. His current area of research is Co-operative Marketing.