Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.6, No.7, 2016

Determinants of Status and Extent of Market Participation among Bulla Producers in Hadiya Zone, Southern Ethiopia

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Abstract
Hadiya zone in southern region of Ethiopia has been well known for enset farming. In the study area, bulla the major product of enset has been perceived to have high market value, resulting in trade-offs with staple food. Despite bulla market value, determinants of bulla producer market participation has not been studied and quantified. Therefore, this paper aims to determine the factors influencing market participation and marketed surplus of bulla. Data was obtained from a sample of 398 households selected using multistage purposive and random sampling techniques. The data were analyzed using the descriptive statistics and Heckman two-stage model. The results showed that age, sex, access to market information, availability of labor, perception of bulla price, extension visit and quantity of bulla producer had significantly influenced market participation decision and extent of marketed surplus. Based on the findings, the study suggest that offering farmers a fair price, encouraging the use of labor saving technology, availing market information services and paying attention to female households are needed to increase bulla marketed surplus.
Key words: Heckman two-stage model, market participation, small-scale bulla farmers.

1. Introduction

Agriculture has been the core driver of economic growth and long-term food security in Ethiopia. The Government committed 15 to 17 percent of expenditures to the sector; it covers 41 percent of gross domestic product (GDP), over 90 percent of export value and directly supports 80 percent of the population's livelihoods (MoFED, 2015). It is also the sector that is given an overriding focus in the government's plan for growth of the economy as a whole.

The main crops produced in Southern Ethiopia include *enset*, cereals, pulses, oilseeds, vegetables, root crops, fruit crops, chat, coffee, hops, and sugarcane. Of these crops, *enset* crop is used as a traditional staple and co-staple food and represent a potential pathway to get out of poverty for many smallholders in Southern and South Western Ethiopia (Elias, 1998; George, 2004. Bulla is an important traditional food product produced from *enset* from solidified liquid after dehydrating a fresh mixture of scraped leafsheath and pulverized corms. More than 20 million people concentrated in the highlands of southern Ethiopia depend upon bulla for human food and sell.

Among the rural areas of the country, Hadiya zone is one of the major areas for bulla production, processing, marketing and consumption. Bulla in Hadiya zone is a major traditional food in most communities and increasingly plays a major role in improving farmers' livelihoods by providing a source of income and valuable source of employment especially for small holder farmers (Tsedale, 2009). Recognition of the potential of markets to unlock economic growth and agricultural development gave rise to market-led rural development paradigm during the 1991s (Readon and Timmer, 2007). In Sub-Saharan African countries like Ethiopia, the government used to play a role in assisting farmers with marketing of agricultural produce. However, a traditional crop not given due attention in terms of production and marketing but having the potential to curb the food insecurity problem in the country, limited access to market facilities, less exposure for market information, infrastructural problems, inadequate support and transportation services are some of the problems resulting in low participation of smallholder farmers in selling bulla products. More importantly marketed supply of bulla in the study areas is subjected to seasonal variations where surplus supply at the harvest time is the main feature. Therefore, understanding the behavior of market participation of bulla and the variables affecting it can be of great importance in the development of sound policies with respect to agricultural marketing and prices, the chain coordination and overall rural and national development objectives of the country. Hence, it was important to analyze determinants of Market Participation of bulla producer and point out potential factors policy should focus in the area.

2. Methodology

2.1. Description of the study area

The study was conducted in Hadiya zone of the Southern Nations, Nationalities and Peoples Regional State (SNNPR). The administrative center of Hadiya zone is Hosanna town, which is located at 232km Southwest of Addis Ababa following the asphalt road that passes through Alemgena, Butajira to Arbaminch. It is one of the 14

administrative zones of the SNNPR with the population of 1,231,196 of which 49.7% are male and 50.3% are female. Out of these, 10.89% live in towns and the rest 89.11% live in rural areas (CSA, 2007). It has a total area of 3, 46958.5 hectares. It is approximately 2000 meters above sea level and its altitude ranges from 501-3000 meters.The area is divided into three ecological zones: Kola 12.9% (lowland <1500m), Woina Dega 68.1% (mid-altitude 1500-2300m) and Dega[4] 19% (highland > 2300m). Most of the area lies within the mid altitude zone. The report from zone administration indicated that Hadiya zone has 10 *woredas* and one administrative town with a total number of 329 administrative *kebeles* of which 303are rural, 8 are urban and 18 are sub urban *kebeles.*

The major crops grown in the zone are *enset*, cereals such as wheat, sorghum barely, *teff,* maize, pulses such as beans and peas, and vegetable such as potatoes, onions and cabbage among others. Generally, the climatic condition is conducive for *enset* crop production which is the main source of bulla product.

2.2. Sampling technique and sample size

For this study, in order to select a representative sample a multi-stage sampling technique was implemented to select bulla producer *kebeles* and sample farm households. In the first stage, within Hadiya zone four major bulla producing and marketing *woredas* were selected in consultation with zonal agricultural office. In the second stage, from selected *woredas* 11 *kebeles* were selected randomly based on probability proportional to the population size of the selected *woredas*. In the third stage, using the list of bulla producing farmers, 398 sample bulla farmers who produce bulla were selected randomly based on probability proportional to the population size of the selected *Kebele's.*

It is important to have a representative data in order to be able to make proper inferences about the population of the study area. Accordingly, appropriate sample size is required to draw valid conclusion about the population are drawn based on Yemane (1967) sample size is determined by the formula:

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

Where, n = the minimum number of sample size, N = the total number of bulla producing households in the study area, e = level of precision or the tolerable error in the sample. The level of precision is the range in which the true value of the population is estimated to be; it is expressed in percentage points (±5). Then, the minimum sample size (n) can be determined by choosing the value of e = 0.05 for the 95% level of significance. Thus, out of the total 155, 200 bulla producing farmers in selected *kebeles*, 398 representative bulla crop farmers was drawn using simple random sampling method and ultimately interviewed.

2.3. Data Types, Sources and method of collection

The data, both quantitative and qualitative types were collected from both primary and secondary sources through semi-structured questionnaire and checklists. Semi-Structured questionnaire was used for the data collection from smallholder farmers through trained enumerators. Qualitative data about business practices and transactions and the patterns and socio-economic activities of the farmers in the study areas were gathered through direct observation, focus group discussions and informal discussions with key informants like DAs, agriculture sector offices, administrators, and ethnic leaders. On the other hand, secondary data on agricultural inputs supplied and consumed, physical characteristics, population size, etc. were gathered thorough reviewing and examination of reports as well as records of published and unpublished documents.

2.4. Method of data analysis

To analyze data, descriptive statistics and Heckman two-stage selection model were used. The main descriptive statistical tools employed to characterize households were means, frequencies, percentages, maximum, minimum, t-test and Chi-square test. The Heckman two-stage selection model was used to determine factors affecting the status and extent of market participation. Heckman has developed a two-step estimation procedures model that corrects for sample selectivity bias and participation and level of participation might be affected by different factors. If two decisions are involved, such as participation and level of bulla sales, Heckman (1979) two-step estimation procedure is appropriate. The first stage of the Heckman model a 'participation equation', attempts to capture factors affecting market participation decision. This equation is used to construct a selectivity term known as the 'inverse Mills ratio' which is added to the second stage 'outcome equation' that explains factors affecting quantity marketed. The inverse Mill's ratio is a variable for controlling bias due to sample selection (Heckman, 1979). The second stage involves including the Inverse Mills ratio to the marketed surplus equation and estimating it using Ordinary Least Squares (OLS). If the coefficient of the 'selectivity' term is significant then the hypothesis that an unobserved selection process governs the participation equation is confirmed. Moreover, with the inclusion of extra term, the coefficient in the second stage 'selectivity corrected' equation is unbiased (Zaman, 2001).

Specification of the Heckman two-step procedure, which is written in terms of the probability of bulla

Market Participation (Y_{1i}), and Marketed Surplus (Y_{2i}) is:
The participation/the binary probit model is specified as:

$$Y^*_{1i} = X_{1i}\beta_{1i} + \varepsilon_i \quad i = 1,2,...,n \tag{2}$$

$$Y_{1i} = 1 \text{ if } Y^*_{1i} > 0 \text{ and } Y_{1i} = 0 \text{ if } Y^*_{1i} \le 0$$

Where Y_{1i} is the probability of bulla producers market participation; which is a dummy variable assuming the value of 1 for market participants and 0 otherwise. Y^*_{1i} is a latent variable, X_{1i} are the variables determining participation in the probit model; β_{1i} are unknown parameters to be estimated in the probit regression model; ε_i is random error term.

Then the parameters can consistently be estimated by OLS over n observations reporting values for Y_{2i} by including an estimate of the inverse Mills ratios denoting λ_i as an additional regressor from the selection equation. More precisely, the observation equation is specified as:

$$Y_{2i} = X_{2i}\beta_{2i} + \mu_i\lambda_i + \eta_i \tag{3}$$

where Y_{2i} is the quantity of bulla marketed in the second step; X_{2i} are the explanatory variables determining the quantity marketed; β_{2i} are unknown parameters that shows estimated in the quantity marketed ; μ_i is a parameter that shows the impact of selectivity bias on the quantity marketed; η_i is the error term.

$$\lambda_i = \frac{f(X_1\beta_1)}{1 - f(X_1\beta_1)} \tag{4}$$

$f(X\beta)$ is density function and 1-f (X 1 $B1$) is distribution function
Before fitting important variables in to the Heckman two-stage selection model it was necessary to test for multicolinearity problem. As Gujarati (2003) indicates, multicollinearity refers to a situation where it becomes difficult to identify the separate effect of independent variables on the dependent variable because of the existing strong relationship among them. In other words, multicollinearity is a situation where explanatory variables are highly correlated. Multicollinearity was tested using variance inflation factor (VIF) which indicates the existence of sever multicolinearity if its value is greater than 10.
Table 13: Description of Explanatory Variables and Working Hypothesis

Variables	Description	Measurment	Expected effect
Sex	Sex of the household head	1=male,0=female	+
Age	Age of the household head	Years	+
Educ	Educational status of the household head	Years	+
Fsize	Family size	Numbers	+
NonF income	Household income from non/off farm activities	Ethiopian birr	+
Sland	Size of enset landholding	Hectares	+
Livestock	Total livestock unit	Tropical Livestock unit	+
Koutp	Kocho output	Quintals	+
Kpp	Perception of kocho price	Ethiopian birr	+
DistMkt	Distance to market center	Kilometers	–
DRS	Response to consumer demand	1=Yes,0=No	+
MktInfo	Access to market information	1=Yes,0=No	+
Credit	Access to credit services	1=Yes,0=No	+
Labor	Availability of labor	1=Yes,0=No	+
Extensio	Extension contacts	1=Yes,0=No	+
Transpo	Transport facilities ownership	Numbers	+

3. Results and Discussion

3.1. Descriptive statistics results

Bulla producers sell different amounts of bulla in the market depending on different demographic and socioeconomic characteristics of the household. On average, bulla producers sold 1.32 quintal of bulla in 2013/14 production season.

The t-test result revealed that quantity of bulla produced by the market participants and non-participants was found to be significant at less than 1% probability level. As expected, farm households with larger quantity of bulla produced had higher marketed surplus than farm households with small quantity of bulla produced. This indicates that quantity of bulla produced can directly influence bulla farmers' market participation decision.

Table 2 shows that non-participant households had higher non/off-farm income than market participating sample bulla producer households. The t-test indicated that there is a significant difference between bulla market participants and non-participants at less than 1% probability level in terms of non/off-farm income.

The t-test result indicated that, there is a significant difference between market participants and non participants in terms of annual extension visits, distance to the nearest market center and livestock holding at less than 1% probability level. Bulla market participants had more annual extension visit, less distance and more livestock.

Chi-square test result revealed that there was a statistically significant mean difference between market participants and non-participants in terms of sex, perception of farmers towards current price of bulla, access to market information, availability of labor, response to market demand and access to credit in bulla production. As indicated in Table 2, market participants had better access to market information, perceived that current price of bulla is attractive, utilize credit and respond to market demand better than non market participants.

Perception of bulla price differs significantly between market participants and non market participants. Market participants experienced attractive prices than non participants. Therefore, creating an environment where higher price of bulla would be offered to farmers is an important policy issue for the concerned bodies so that farmers would benefit from the sale of bulla.

Table 214. Socio-economic characteristics of participants and non participants in bulla market

Continuous variables	Participants (n =269)	Non participants (n =129)	Overall (n = 398)	t/ χ^2 - value
	Mean/ (%)	Mean/ (%)	Mean /(%)	
Age	46.70	47.54	46.96	0.76
Family size	6.32	6.04	6.24	-1.16
Extension visits	5.03	1.28	3.89	-15.62***
Enset landholding	0.19	0.17	0.18	-0.74
Education level	5.44	4.73	5.23	-11.8***
Bulla output	4.22	3.57	4.02	-12.05***
Distance to market	3.33	6.53	4.31	11.34***
Non/off-farm income	4283	11721	6547.80	17.64***
Livestock holding	3.46	3.09	3.35	-1.98**
Dummy variables (yes, %)				
Sex	85	93	88	8.54***
Availability of labor	91	17	67	206.15***
Ownership of transport facilities	82	32	66	116.03***
Price of bulla	86	25	68	116.25***
Market information	88	29	69	165.15***
Credit	28	11	28	3.87**
Response to demand	63	18	48	85.69***

***, ** and * represents significance at 1%, 5% and 10% probability levels, respectively.

Source: Own computation of survey data (2014)

3.2. Econometric results

The Heckman sample selection model was employed to identify the determinants of market participation and marketed surplus. Before running the econometric models (Heckman two-step procedure), the hypothesized predictor variables were checked for the existence of multicollinearity problem. The Breusch-Pagan / Cook-Weisberg test was also employed to detect heteroskedasticity. However, in the present study, the test result shows that heteroskedasticity was not a problem. Moreover, endogeniety test results showed that except quantity of bulla produced there was no endogeneity problem of all other explanatory variables. This problem can be overcome by using two stages least squares (2SLS) method. The method involves two successive stages. The first regresses the suspected endogenous variable over the pre-determined or pure exogenous variables and

instrumental variables to get their predicted values. Then the predicted values from the first stage regression are used to estimate the bulla marketed surplus equation. Farm experience variable is used as instrumental variable.

3.2.1. Determinants of bulla market participation

In the first stage, households decide whether they would be bulla sellers or not. The decision to participate in bulla market was estimated by probit maximum likelihood estimator. A total of sixteen potential predictor variables (nine continuous and seven dummy) were selected and entered into the selection/probit model.

Results of first-stage probit model estimation of the determinants of bulla market participation decision of the sampled households are given in Table 3. The model chi-square tests applying appropriate degrees of freedom indicate that the overall goodness of fit of the probit model is statistically significant at a probability of less than 1%. The McFadden's Pseudo R-square is calculated and the obtained value indicates that the independent variables included in the regression explain significant proportion of the variations in the enset farmers' likelihood to add values to bulla. The model has correctly predicted 98% of the observations, with significant chi-squared value of 377.36.

Out of the sixteen explanatory variables, five of them were found to determine the probability of participating in bulla market significantly. These are: age of household head, availability of labor, perception of price bulla, access to market information, non/off farm income and quantity of bulla produced. Explanatory variables that appeared to be statistically significant are presented and discussed here under.

Table 3. First-stage probit estimation results of determinants of bulla market participation

Variables	Coefficient	Standard error	Z	Marginal effect
constant	-44. 360***	8.574	-5.19	
Age	-0. 051**	0.027	-1.86	-0. 002
Sex	0. 841	0.513	1.64	0. 072
Education	0. 008	0.044	0.18	0. 001
Family size	0. 010	0.071	0.14	0. 001
Livestock	0. 103	0.097	1.06	0. 004
Predicted output	0. 756**	0.340	2.22	0. 032
Transport facilities	0. 502	0.404	1.24	0. 026
Labor	1. 927***	0.362	5.32	0. 214
Perception of price	0. 059***	0.012	4.85	0. 089
Market distance	-0. 082	0.072	-1.13	-0. 003
Land size	0. 239	1.086	0.22	0. 010
Non/off-farm income	-0. 109	0.227	-0.48	-0. 004
Market information	0. 961**	0.425	2.26	0. 065
Demand response	-0. 123	0.424	-0.29	0. 005
Credit	0. 144	0.389	0.37	0. 005
Extension	0. 119	0.077	1.53	0. 005

Number of observations= 398 Prob > chi2 = 0.0000, LR chi^2 (17) = 377.36, predicted = 98%, Pseudo R^2 = 0.81, Log likelihood = -45.479551

The dependent variable Bulla market participation (Bmp) is a dummy variable that takes the value 1 if the farmer had participated in bulla market, 0 otherwise. Farm experience is an instrument for bulla quantity produced. ***, ** and * represents significance at 1%, 5% and 10% probability levels, respectively.

Source: Survey data (2014)

Age of the household head: Age was expected to affect market participation decision positively. However, the opposite has been observed in the result. The model result depicts that age of the household head had a negative impact on market participation decision of the sampled bulla households and it was significant at 5% significance level. The negative and significant relationship between the two variables indicates that as the household head gets older carrying the product to the market becomes more difficult which in turn decreases the probability of the household decision to enter the bulla market. The marginal effect also confirms that when the age of household head increases by one year, the probability of participating in the bulla market decreases by 0.20%.

Amount of bulla produced: As was expected, this variable had positive relationship with household's bulla market participation decision and it was found to be statistically significant at 5% probability level. The positive and significant relationship between the variables indicates that as the amount of bulla output produced increases, the probability of market participation also increases. The marginal effect of the variable also confirms that a one quintal increase in the amount of bulla produced leads to the rise of the probability of bulla farm households' market participation by 3.20% keeping all other factors constant. This finding tallies with that of Mussema and Dawit (2012) who observed that in Ethiopia when farmers produce more pepper, it motivates them to sell more.

Perception of farmers towards current price of bulla: As was expected, this variable had positive relationship with household bulla market participation decision and it was found to be statistically significant at 1% probability level. The positive and significant relationship between the variables indicates that as the perception of bulla price attractive, the probability of market participation also increases. The marginal effect of the variable also confirms that if farmer considers price of bulla as attractive, the probability that the farm household participates in the bulla market would increase by 8.90%. This result in consistent with Boughton (2007) who argues that local maize prices had a strong positive and highly significant effect on the probability of maize market participation in Mozambique.

Access to market information: Access to market information significantly and positively influences bulla market participation. The result shows that access to market information increases the probability of participating in the bulla market by 6.5%, all other factors held constant. Market information is vital instrument during marketing because it informs the farmers about marketing conditions. Farmers who have price information prior to marketing tend to sell more of their produce than those without. The finding is consistent with the results of Key *et al*. (2000) and Alene *et al*. (2008) who found the existence of positive relationship between the market information and the proportion of sale. Goetz (1992) also noted that better market information significantly raises the probability of market participation for potential selling households.

Availability of labor: Availability of labor for bulla market participation decision is positively and the effect is statistically significant at less than 1%. The marginal effect also confirms that availability of labor increases the probability of participating in the bulla market by 21.40%, all other factors held constant. Bulla production is labor intensive. A household with more number of labor produce more bulla and participate in market. Contarary to this study, a study by Singh and Rai (1998) revealed that marketed surplus of buffalo milk was negatively related with family size.

3.2.2. Determinants of bulla marketed surplus

Heckman's second stage of estimation identifies the significant factors that determine bulla marketed surplus by using the selection model which included the inverse Mill's ratio calculated from a maximum likelihood probit estimation of bulla market participation decision. The coefficient of Inverse Mills ratio (Lamda) in the Heckman two-stage estimation is significant at the probability of less than 1% (Table 4). The overall joint goodness of fit for the Heckman selection model parameter estimates is assessed based on the log likelihood ratio test. The model chi-square tests applying appropriate degrees of freedom indicate that the overall goodness of fit for the Heckman selection model is statistically significant at a probability of less than 1%. This shows that jointly the independent variables included in the selection model regression explain the level of participation.

Tabel 4. Results of the second-stage Heckman selection model for bulla marketed surplus

Variables	Coefficient	Standard error	Z-value
Constant	-2.143***	0.639	-3.35
Age	0. 003	0.005	0.6
Sex	-0. 266***	0.065	-4.09
Education	-0. 010	0.006	-1.66
Family size	-0. 011	0.010	-1.10
Livestock	0. 018	0.013	1.40
Predicted output	0. 446***	0.066	6.75
Perception of price	0.101***	0.031	3.25
Transport facilities	0. 013	0.065	0.21
Labor	0. 229***	0.069	3.32
Land size	0. 093	0.127	0.73
Non/off-farm income	-0. 011	0.026	-0.42
Market information	0. 004	0.082	0.05
Demand response	-0. 034	0.052	-0.65
Credit	0. 044	0.053	0.83
Extension	0. 024**	0.011	2.18
Mills lambda (λ)	0. 292***	0.097	3.01
Rho	0.798		
Sigma	0.366		
Lambda	0.292		

Wald chi2 (16) = 209.41 (0.0000) ***, R-squared = 0.75, Adj R-squared = 0.74.

The dependent variable (BMP) is the amount of bulla marketed. Farm experience is an instrument for bulla quantity produced. *, ** and *** represents significance at 10%, 5% and 1% probability levels, respectively.

Source: Survey data (2014)

Sex: Sex of the household head significantly and negatively affected marketed surplus of bulla at 1%

significance level. Being male headed household has negative relationship with marketed surplus than female headed one. The result indicated that being male headed household decreases marketed surplus of bulla by 0.27 quintal per year. This suggests that the female-headed households are contribute more labor and time in harvesting, production, processing and sale of bulla than male, hence they participate more in the market. The reason might be the bulla production and business is gender specific in the study area. Gizachew (2005) found that in Ethiopia female-headed households had a higher tendency to participate in the dairy market than male-headed households.

Amount of bulla produced: As expected, amount of bulla produced has a positive effect on bulla quantity sold per household per year because it is statistically significant at 1% probability level. The model output predicts that the addition of one quintal produced causes the marketed bulla surplus of the farmer household to rise by 0.45 quintal per bulla producer household per year. This result suggests that marketed bulla surplus of the household in the study areas are more responsive to amount of bulla produced. Farmers with more bulla output are usually market oriented since the higher production levels enable them to sell the surplus produce. Furthermore, this result elaborates that marketed bulla surplus per year increases in response to the increase in amount of bulla produced. This result was in confirmation with the study by Abraham (2013) as production affected the amount of potato, avocado and tomato supplied to the market positively. A study by Wolday (1994) on output of food grains (wheat, teff and maize) and Rehima (2007) on pepper market also found that quantity produced has positive effect on quantity supplied to the market.

Perception of farmers towards current price of bulla: Perception of bulla Price affected marketed surplus positively at less than 1% significance level. The result indicated that if farmer considers price of bulla as attractive, quantity of marketed surplus in quintal would increase by 0.10 quintal per year. This result supports the study of Adesiyan *et al.* (2012) who found that average price of paddy received by farmers' affected marketed surplus of the crop positively. This is related to farmers' decision to sale when there is high price because they need to increase their income to purchase other consumption items and production inputs. Price signals generated and transmitted to active actors along the value chain can influence production and consumption decision of the actors (Timmer, 1974). Onoja *et al*. (2012) found higher probability of fish market participation with an increase on price of fish in Nigeria. The author justified that households with higher expectation of making profits from price signals are more likely to participate in fish marketing in the study area.

Availability of labor: Availability of labor significantly and positively affected marketed surplus of bulla at 1% significance level. Thus, a shift from lack of labor to availability of labor for production of bulla would increase the extent of farmers participating in the bulla market by 0.23 quintal, all other factors held constant. Bulla production is labor intensive. This indicates that a household with more number of labor produce more bulla and supply large volume of bulla to the market.

Access to extension contacts: As expected *a priori*, an increase in the number of extension visits significantly and positively affected bulla farmers' extent of bulla marketed surplus at less than 5% significance level. The result indicated that an extra extension visit would increase the bulla market surplus by 0.024 quintal per year. This could be attributed to the fact that an increase in the number of extension visits would avail up to date information regarding agricultural technologies that might improve productivity and therefore increase the marketed surplus. The finding corroborates that of Negash (2007) who found that frequent extension visits increased the likelihood of adoption of improved haricot beans in Alaba Special District of Ethiopia. The authors reasoned that frequent extension visits provided current information and this made the farmers conscious of production and production techniques of the commodity.

Lambda (λ): According to the model output, Lambda (Inverse Mill's Ratio) or selectivity bias correction factor has a significant positive impact on bulla farm household marketed surplus at 1% significance level. And this result suggests that there are unobserved factors that might affect both the probability of bulla farm household's market participation decision and marketed surplus. And, the positive sign of the lambda shows that there are unobserved factors that are positively affecting both participation decision and marketed surplus of bulla justifying the appropriateness of the Heckman model, for identifying the determinants of bulla market participation and marketed surplus.

4. Conclusion and Recommendation

Different socio-demographic characteristics of both categories of farmers (market participants and non-market participants) were determined. Results of the Heckman's selection model pertaining to the determinants of probabilities of bulla market participation and extent of bulla market participation of the sampled households were influenced by different set and levels of determinant factors. To this effect, age of household head, access to market information, availability of labor, perception of bulla price and quantity of bulla impacted the first binary decision of whether or not to participate in bulla market. On the other hand sex of the household head, availability of labor, price, extension visit, quantity of bulla and inverse Mill's ratio (LAMBDA) impacted the second decision concerning farm households' extent of bulla market participation in large sales.

Therefore, broad-based policies towards introducing improved enset variety, encouraging the use of labor saving technology, strengthening the existing extension package program, promoting and empowering females, strengthening rural urban infrastructure. Farmers in the study area do not get timely market information up on which to base their marketing decision. They depend on traders and other farmer friends for price information. Therefore, there has to be an institution that can convey reliable and timely market information required by all stakeholders simultaneously. This would make the marketing system to operate efficiently and harmoniously. The availability of timely and precise market information increases producers' bargaining capacity to negotiate with buyers of their produce. In order to obtain this advantage there is a need to improve extension system which focused on market extension and linkage of farmers with markets is necessary to ensure a reliable market outlet for producers of the study area.

5. Acknowledgement

We would like to acknowledge the ministry of education for funding the study. Special thanks go to the enumerators for data collection and farmers who volunteered information. God bless them.

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