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Determinants of Smallholder Farmers' Wheat Market Participation and Commercialization in East Shewa Zone, Oromia Region, Ethiopia

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Abstract

Agricultural commercialization is the process of shifting from growing crops for home consumption to growing crops for sale. It can involve changes in production, input use, and marketing. This study was aimed to identify factors influencing farmers' market participation decision and level Wheat market participation in East Shewa Zone. A two-stage random sampling procedure was used to select 122 sample households Wheat producer. Descriptive statistics and econometric model were used to analyze the data. The result revealed that about 57.38% of sample households were participating in wheat marketing. The average level of Wheat commercialization was 39.4 %. The result of probit model indicated that wheat market participation decision was significantly affected by experience of wheat production, family size, lagged price of wheat, access to market information and frequency of extension contact. In the second hurdle truncated, the level of wheat commercialization significantly and positively influenced by education level, wheat farming experience, lagged market price of wheat and frequency of extension contact positively while family size and livestock holding affected level of wheat commercialization negatively. The study indicated that the government, stakeholders and concerned bodies need to focus on facilitating farmers to participate in arrange experience sharing among wheat producer farmers, provision of capacity building training, strengthen extension service and disseminate market information to wheat producers so as to improve wheat market participation decision and intensity of wheat commercialization.

Keywords: Commercialization; Double-hurdle; Market participation and East Shewa Zone

Introduction

Background of the Study

Wheat is one of the major food crops that has potential impact on food security that second grain produced after maize production in the world [1]. Sub-Saharan African countries, wheat has low productivity with rising demand and prices. Wheat productivity in Sub-Saharan Africa is considered low, with average yields typically around 20 Quintals per hectare, significantly below the global average, largely due to factors like climate stress, poor soil quality, limited access to improved technologies, and disease pressure. Increasing wheat production and productivity is crucial for meeting global wheat food demand, and thereby mitigate the impacts of food shortage and rising food prices.

The priority areas that the government of Ethiopia has been making reformation in the agriculture sector to stimulate rural development and poverty reduction [2]. Ethiopia has given a high priority to wheat production to achieve food self-sufficiency and generate exportable wheat surplus. To achieve this goal, Ethiopian government has supported and promoted irrigated wheat production in lowland areas in addition to wheat production in the main rainy season.

In Ethiopia, the wheat commercialization program is aimed at improving the livelihood of different actors engaged in the wheat value chain. Several studies confirmed that wheat commercialization plays an important role in poverty reduction, job creation, income generation, meeting household consumption needs, and ensuring food security [3].

Cereals are produced in larger volume compared with other crops because they are the principal staple crops. Cereals contributed 88.52% (about 296,726,476.94 quintals) of the grain production. *Tef,* maize, sorghum and wheat took up 24.11% (about 3,101,177.38 hectares), 17.68% (about 2,274,305.93 hectares), 14.21% (1,828,182.49 hectares) and 13.91% (1,789,372.23 hectares) of the grain crop area, respectively. Maize, Tef, wheat and sorghum made up 28.75% (96,357,345.00 quintals), 17.11% (57,357,101.87 quintals), 15.86% (53,152,703.28 quintals) and 15.71% (52,655,800.59 quintals) of the grain production, in the same order. East Shewa produced about 414951.77 hectares cereals which major crops produced were Maize, Wheat and *Tef* covers 93269.96 hectares, 96474.81 hectares and 215641.23 hectares respectively [4].

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Statement of the Problem

The commercialization of crops grown has the potential to increase Household food security, reduce rural poverty, and contribute to agricultural development and economy wide growth [5]. Commercialization can increase farming incomes, enhance purchasing power and reduce vulnerability to food insecurity of smallholders. Policymakers in Ethiopia and elsewhere view agricultural commercialization as an essential part of the process of agricultural modernization, Specialization, and structural transformation of the economy toward more rapid and sustainable growth. Increased incomes resulting from commercialization led to increased food consumption and improved nutrition [6].

Commercialization is affected by many factors agro-climatic conditions and risks; access to markets and infrastructure; community and household resource and asset endowments; development of local commodity, input, Factor markets; laws and institutions; cultural and social factors affecting consumption preferences, production, and market opportunities and constraints [7].

East Shewa Zone Wheat was contributed for consumption and sale purposes. But government focus on commercialization by introducing agricultural commercialization clusters for this commodity in this zone. Commercialization can increase farming incomes, enhance purchasing power and reduce vulnerability to food insecurity of smallholders [5]. Therefore, identification of the determinants of smallholder farmers' wheat market participation decision and farmers' level of wheat commercialization are crucial to improve farmers income by improving their level market participation decision and level of wheat commercialization.

Objectives of the Study

The specific objectives of the study were:

1. To assess the status of smallholder farmers wheat commercialization in the study area.

2. To identify factors affecting smallholder farmers wheat market participation decision

3. To identify factors affecting smallholder farmers level of wheat commercialization in the study area

Research Methodology

Description of the Study Area

This study was conducted in East Shewa zone of Oromia region, Ethiopia. East Shewa is one of the administrative zones of Oromia Regional State that located in the south eastern part of Ethiopia. This zone is bordered on the south by the West Arsi Zone, on the southwest by the Southern Nations, Nationalities and Peoples Region, on the west by Southwest Shewa Zone and Oromia Special Zone Surrounding Finfinne, on the northwest by North Shewa, on the north by the Amhara Region, on the northeast by the Afar Region, and on the southeast by Arsi. Based on the [8] Census conducted this Zone has a total population of 1,356,342, of whom 696,350 are men and 659,992 women; with an area of 8,370.90 square kilometers, East Shewa has a population density of 162.03. While 340,225 or 25.08% are urban inhabitants, a further 664 or 0.05% are pastoralists. A total of 309,726 households were counted in this Zone, which results in an average of 4.38 persons to a household, and 296,342 housing units.

Sources and Methods of Data Collection

Primary and secondary data sources were used for this study. Semi-structured questionnaires were employed to collect primary data from representative sample of households. Secondary data collected from East Shewa Zone office of agriculture, published and unpublished sources.

Sampling Procedure and Sample Size

A Multi-stage sampling procedure was used to sample selection. In the first stage potential wheat producer Lume and Ada'a districts were selected. In second stage Potential kebeles for wheat producers were purposively identified. The third stage, about 122 households was randomly selected from the total wheat producer farmers in the districts using [9] sample size determination.

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

Where: n = is the sample of major crops producer households in the Zone N = is the total major crops producer in the Zone and e = 0.09 is the level of precision

Method of Data Analysis

Descriptive statistics and econometric model were used for analyzing the data. The descriptive statistics such as mean, standard deviations, minimum and maximum values, frequencies, and percentages was used to describe the households. Furthermore, t-test and chi-square test would also use to compare market participant and non-participant in terms of explanatory variables.

The household commercialization index (HCI) measures the extent to which household crop production is oriented toward the market. A value of zero would signify a totally subsistence-oriented household and the closer the index is to 100, the higher the degree of commercialization [10].

The index measures the ratio of the gross value of crop sales by household i in year j to the gross value of all crops produced by the same household i in the same year j expressed as a percentage.

$$HCI = \frac{Gross\ value\ of\ crop\ sales\ hh\ i\ year\ j}{Gross\ value\ of\ all\ crop\ production\ hh\ i\ year\ j} x100\ \%$$

The index measures the ratio of the gross value of crop sales by household i in year j to the gross value of all crop production by the same household i in the same year j expressed as a percentage. In this study wheat produced in the study area used. A double hurdle model was used to analyzed econometric model.

Double hurdle model [11] involves two-step estimation procedure. In the first stage, probit model was used to identify factors affecting decision to market participate. Probit model takes values 1 and 0 that were assigned to represent the choice whether a farmer decides to sold major crops or not. The standard probit model that assesses the household market-entry decision was described as follows:

First Stage: The decision to market participates can be modeled

as a probit regression following [11] can be given:

$$Y_i^* = x_i\beta + e_i \quad (1)$$

$$Y_i = \begin{cases} 1 \text{ if } Y_i * > 0 \\ 0 \text{ if} Y_i * \leq 0 \end{cases}$$

where e_i is independent of x_i which is a 1 by K vector of factors affecting the decision to participate for all households (i), β is a 1 by K vector of parameters, and $e_i \sim N(0,1)$

Second stage: In the second stage, the truncated regression model is used to analyze factors determining the level (extent) of commercialization. Truncated regression excludes part of sample observation based on the value of the dependent variable [12]. That is, the truncated regression uses observations only from farming greater than zero. The intensity of major crops commercialization is modeled as a regression truncated at zero:

$$Z_i^* = x_i\beta + \mu_i \ , \ \mu_i \sim N(0, \delta^2) \quad (2)$$

$$Z_i = \begin{cases} Z_i^* \text{ if } Z_i^* > 0 \text{ and } Y_i = 1 \\ 0 \text{ otherwise} \end{cases}$$

Where Z_i is the intensification level of commercialization which depends on latent variable Z_i^* being greater than zero and conditional to the decision to participate Y_i.

If both decisions are made by the individual farmer independently, the error terms are assumed to be independently and normally distributed as: $u_i \sim N(0, \sigma^2)$

The log-likelihood functions as the double-hurdle model that nests a univariate probit model and a truncated regression model is given following [11] by:

$$LogL = \sum \ln\left[1 - \Phi(Z_i'\alpha)\left(\frac{x_i'\beta}{\sigma}\right)\right] + \sum_{+} \ln \Phi(\eta_i'\alpha)\frac{1}{\sigma}\phi\left(\frac{y_i - x_i'\beta}{\sigma}\right) \quad (3)$$

Where, Φ and ϕ refer to the standard normal probability and density functions respectively, Z_i' and X_i' represent independent variables for the Probit model and the Truncated model respectively, α, σ, and β are parameters to be estimated for each model.

Table 1: Summary of variables description and hypothesis.

Dependent Variables	Unit/ type	Variables Description
Market participation decision	Dummy	If households sold wheat value of 1and 0 otherwise
Level of Commercialization	Continuous	Household commercialization index in percent
Explanatory Variables	**Description of variables**	**Exp sign**
Land under wheat production	Continuous, cultivated land in hectares	+
Dependency ratio	Continuous, ratio of less 15 and above 65 years to b/n 15 to 64 years	-
Wheat farming experience	Continuous, experience of production in years	+
Education level	Continuous, education status years of schooling	+
Family size	Continuous, number of family members	+/-
Distance to market center	Continuous, in kilometers	-
Distance to all weather roads	Continuous, in kilometers	-
Access to market information	Dummy, yes=1, 0=No	+
Frequency of extension contact	Continuous, number of extensions contact	+
Access to credit service	Dummy, Yes=1, 0=No	+
Participation in farmer groups	Dummy, Yes=1, 0=No	+
Livestock owned	Continuous, tropical livestock unit	+/-
Lagged market prices of wheat	Continues, ETB Per Kg	+

Results And Discussion

Descriptive Statistical Results

Demographic characteristics of the sample household farmers: Sex of the household heads: As indicated table below, of the entire household heads interviewed, 95.9 % were male-headed while the remaining 4.1% were female-headed (divorced or widowed) at the time of survey. The result of Chi-square tests indicated insignificant difference in terms of sex of the household heads between sample households Wheat market participant and non-participant.

Summary of Continues Variables: The average age of the sample respondents was found to be 44.49 years and the average family size of the sample households was 5.45 persons per household. The average dependence ratio was 0.59. An independent t-test result indicates insignificant difference between wheat market participant and non-participant sample households in terms of age and dependency ratio while significant difference in terms of family size. The average family size of participants greater than non-participants implied that availability of labour force for more production. The average cultivated land holding size of the sample households was 1.47 hectares, which is greater than national average of 0.95 hectares [13]. The average areas covered by Wheat during the year 2023 cropping season was 0.60 hectares, which accounts for about 40.81 % of the average cultivated land. This indicates that Wheat cropping system are dominant in the study area. Independent t-test showed statistically significant difference between market participant and non-participant sample households in terms of land allocated for Wheat at 5% significance level. The result indicated that market participant sample households allocate more amount of land as compared to non-participant for Wheat producers. The average livestock holdings measured in terms of tropical livestock unit (TLU) were found to be 5.32. The mean education level of sample household was 4.31 years of schooling ranges from illiterate to fist degree. The mean farming experiences Wheat producers was 18.57 years. The frequency of extension contact was 4.47 times in survey year which mostly provided by development agent. The average distances to travel from farm to the market center

Table 2: Sex of sample household heads.

Commodity	Market participation decision		Sex		
		Percent	Male	Female	Total
Wheat		No.	67	3	70
	Participants(n=70)	%	95.7	4.3	100
		No.	50	2	52
	Non-participants(n=52)	%	96.2	3.8	100
Total sample size (n=122)		No.	117	5	122
		%	95.9	4.1	100
χ2-value	0.0147				

Source: Survey result, 2023.

Table 3: Summary of descriptive continuous variables.

Variables	Wheat Market Participation						t-value
	Participants (n=70)		Non-participants (n=52)		Over all (n=122)		
	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.	
Age of household head	45.21	12.11	43.52	13.52	44.49	12.73	-0.726
Family size	5.7	2.48	4.9	1.94	5.45	2.25	-2.36**
Dependency ratio	0.57	0.52	0.62	0.54	0.59	0.53	0.329
Cultivated land (Ha)	1.64	1.16	1.23	1.06	1.47	1.14	-1.95*
Land for wheat (ha)	0.65	0.38	0.52	0.3	0.6	0.35	-2.14**
Livestock holding (TLU)	6.31	3.59	3.99	2.95	5.32	3.51	-2.79***
Education level	4.81	4.17	3.63	4.26	4.31	4.22	-1.54
Wheat farming experience	22.84	7.55	12.83	5.73	18.57	8.43	-8.00***
Frequency of extension contact	5.11	4.09	2.04	2.35	4.47	4.31	-7.28***
Distance to all weather roads	2.19	2.2	2.48	2.42	2.31	2.29	0.69
Distance to market center	5.13	4.08	8.76	5.01	6.68	4.83	4.58***
Lagged price of wheat	33.33	4.96	28.44	3.26	31.25	4.94	-6.18***

***, ** and *: implies statistical significance 1%, 5% and 10% levels respectively.
Source: Own survey result, 2023.

by sample farmers in the study area was 6.68 km. The average distance all-weather road from the study area was 2.31 km. The average lagged price of wheat was 31.25 Ethiopian birr per kilogram. Independent t-test showed statistically significant difference between market participant and non-participant sample households in terms of livestock holding, wheat farming experience, frequency of extension contacts, distance to market center and lagged price of wheat while insignificant difference in terms of education level and distance to all-weather roads (Table 3).

Summary of Dummy variables: Out of the total households interviewed, only 29% participated in non and off-farm activities which was 30% wheat market participant and 15.38 non-market participants. The majority of households depend on farming activities for both participant and non-participant. Sample farmers participated in social organization was 40.98% from which 47.14% wheat market participant and 25% non-market participants. Related to credit services only13.93% of the sample farmers had access to credit either in the form of cash or kind. From this 17.14% wheat market participant and 9.62% non-market participants.

However, the majority of 86.07% of respondents had not used credit because of high interest rate, shortage of credit service, religious view and inappropriate payback period of received loan. Sample respondents' access to market information was 58.2% which 84,29% wheat market participant and 23.07% non-market participants. The Chi-square test result showed that insignificant differences between wheat market participant and non-participant farmers with respect to access to credit service while significant difference in terms of participation in non/and off- farm activities, participation in social organization and access to market information (Table 4).

Wheat Commercialization Index

Commercialization index was determined by the proportion of value of wheat sold to value of wheat produced multiplied by 100 expressed in percentage and used to identify non-commercialized and commercialized sample households. The level of wheat commercialization was 39.4%. This result was similar finding with [14] conducted study on Wheat Commercialization and Its Determinant Factors in Walmara, Central Ethiopia. Thus, more than half of the wheat producers not commercialized for (Table 5).

Results of the Double hurdle Model

Determinants of wheat market participation decision: The probit regression model was used to analyze the wheat market participation decision of the households after normality of data distribution and better goodness-of-fit as compared to logit model was checked. The model chi-square test indicates that the overall goodness-of-fit of the probit model was statistically significant at 1% probability level which in turn indicates the usefulness of the model to explain the relationship between the dependent and at least one independent variable.

Table 4: Summary of descriptive dummy variable.

Variables	Response	Market Participation decision						χ2-value
		Participants (n=70)		Non-participants (n=52)		Over all (n=122)		
		Freq	%	Freq	%	Freq	%	
Non/and off-farm activity participation	Yes	21	30	8	15.38	29	23.77	3.52*
	No	49	70	44	84.62	93	76.23	
Participation in social organizations	Yes	33	47.14	13	25	50	40.98	9.57***
	No	37	52.86	39	75	72	59.02	
Access to Credit service	Yes	12	17.14	5	9.62	17	13.93	1.41
	No	58	82.86	47	80.38	105	86.07	
Access to market information	Yes	59	84.29	12	23.07	71	58.2	45.95***
	No	11	15.71	40	76.93	51	41.8	

*** and *: implies statistical significance 1% and 10% levels respectively.
Source: Survey result, 2023.

Table 5: Commercialization index of Wheat production.

Commodity	Statistics	
	Mean	Std.Dev
Wheat	0.394	0.381

Source: Survey result, 2023.

Table 6: Determinants wheat market participation decision of households.

Variables	Coefficient	Robust Std.Err	P > z	Marginal effect
Experience of wheat production	0.076**	0.035	0.029	0.023
Education level	-0.068	0.051	0.187	-0.02
Family size	0.226***	0.072	0.002	0.068
Dependency ratio	0.38	0.032	0.223	0.115
Livestock holding (TLU)	-0.009	0.06	0.884	-0.003
Lagged price of wheat	0.125***	0.046	0.007	0.038
Land allocated for wheat production	-0.292	0.557	0.599	-0.088
Participation in social organization	0.137	0.421	0.745	0.041
Access to credit services	0.13	0.48	0.788	0.038
Access to market information	0.182***	0.063	0.004	0.428
Frequency of extension contact	1.375***	0.407	0.001	0.055
Distance to market center	-0.044	0.037	0.229	-0.013
Constant	-6.902***	1.698	0	

***, **: implies statistical significance 1%, and 5% levels,
Log pseudo likelihood = -32.542, Pseudo R^2= 0.609, Wald $chi^2(12)$ = 50.94 Prob> chi^2 = 0.000, N = 122, Source: model result, 2023.

Table 7: Determinants of level of wheat commercialization by sample households

Variables	Coefficient	Robust Std.Err	P > z
Education level	0.005	0.004	0.176
Family size	-0.013*	0.007	0.054
Wheat farming experience	0.002*	0.002	0.082
Livestock holdings (TLU)	-0.013***	0.005	0.006
Lagged price of wheat	0.021***	0.003	0
Land for wheat production	0.062	0.049	0.208
Participation in social organization	-0.036	0.034	0.293
Access to credit service	-0.013	0.046	0.841
Frequency of extension contact	0.015***	0.005	0.001
Access to market information	-0.053	0.05	0.159
Distance to all weather road	-0.014	0.009	0.1
Distance to market center	-0.004	0.006	0.501
Constant	0.034	0.129	0.794
Sigma	0.122***	0.007	0

***, **, *: implies statistical significance at 1%, 5%, and 10% levels, Log pseudo likelihood = 47.82, Wald chi^2 (12) = 156.44 Prob> chi^2= 0.0000, N = 70, Limit: lower = 0, upper = + inf, Source; model result, 2023.

The result of probit model estimation indicated that the wheat market participation decision in the study area was significantly influenced by experience of wheat production, family size, lagged price of wheat, access to market information and frequency of extension contact (Table 6).

Experience in wheat production (EXP): Experience of wheat production is found to have a positive and significant influenced on wheat market participation decision as prior expectation at 5% level of significance. This result implies that for each additional one year, the probability of households' wheat market participation decision would increase by 2.3%, keeping all other factors constant. This could improve sample household head management skills and his knowledge to improve productivity that increase his/her market participation decision. This is in line with the finding of [15].

Family size (FSZ): Family size is found to have a positive and significant influenced on wheat market participation decision as prior expectation at 1% level of significance. This result implies that for each additional one person, the probability of households' wheat market participation decision would increase by 6.8%, keeping all other factors constant. Family size increase market participation through availability of labor for producing surplus Tef that contribute decision supply more to the market. Family size is expected to have positive relationship with market-orientation. This is in line with the finding of [16].

Lagged market prices of wheat: Lagged market prices of wheat is found to have a positive and significant influenced on wheat market participation decision as prior expectation at 1% level of significance. This result implies that for each additional one Ethiopian Birr, the probability of households' wheat market participation decision would increase by 3.8%, keeping all other factors constant. This is because prices stimulate production, and thus market supply to market. This is in line with the finding of [17].

Access to market information: Access to market information was found to have a positive and significant influenced on wheat market participation decision at 1% level of significance. Farmer who had access to market information were 42.8% more probability of wheat market participation decision than others, keeping all other factors constant. This finding implies that households with better information access produce wheat for market that are more likely to participate in wheat production for market. This is in line with the finding of [18].

Frequency of extension contact (EXTEN): Frequency of extension contact was found to have a positive and significant influenced on sample household head wheat market participation decision at 1% level of significance. The result implies that an additional unit of extension contact would increase household head wheat market participation decision by 5.5% than others, keeping all other factors constant. This implies that agricultural extension services enhancing farmer skills and knowledge, link farmers with modern technology and increase productivity. This is in line with the findings of [19].

Determinants of intensity of wheat commercialization (Truncated regression): The truncation model result was statistically significant at less than 1% level, indicating the goodness of fit of the model to explain the effects of the hypothesized variables on the dependent variable in terms of at least one covariate. The estimation results revealed that the farmers' intensity of wheat commercialization was influenced significantly by education level, family size, wheat farming experience, livestock holding, lagged market price of wheat and frequency of extension contact (Table 7).

Family size (FSZ): Family size is found to have a negative and significant influenced on wheat market participation decision as prior expectation at 10% level of significance. This result implies that for each additional one person, the level of wheat commercialization would decrease by 1.3%, keeping all other factors constant. This result indicated that the higher the number of household members, the more they were consumed their production that lowers proportion to sale. This is in line with the finding of [20].

Experience in wheat production (EXP): Wheat farming experience was found to have a positive and significant influenced

on farmers levels of wheat commercialize as prior expectation at 10% level of significance. Each additional one year of sample household head would increase farmer's level of wheat commercialization by 0.2% than others, keeping all other factors constant. This implied as farmer that has been involved in the production of wheat production more skills to increase productivity that leads to increase level of wheat commercialization. This results in line with the findings of [21].

Livestock owned (TLU): Livestock holding size, which is a proxy for measuring wealth status of household head, is found to have a negative and significant influenced on farmers' level of wheat commercialize at 1% level of significance. This significance indicates that farmer with large number of livestock being less likely to commercialize Tef than others may be due to their use of livestock products to meet financial needs rather than using Tef for consumption. This result implies that for each additional tropical livestock unit, the level of wheat commercialize in would decrease by 1.3% keeping all other factors constant. This is in line with the finding of [22].

Lagged market prices of wheat: A lagged market price of wheat is found to have a positive and significant influenced on level of wheat commercialization as prior expectation at 1% level of significance. This result implies that for each additional one Ethiopian Birr, the level of wheat commercialization would increase by 2.1%, keeping all other factors constant. This is because prices stimulate production, and thus market supply to market. This is in line with the finding of [23].

Frequency of extension contact: Frequency of extension contact was found to have a positive and significant influenced on sample household head level of wheat commercialization at 1% level of significance. The result implies that an additional unit of extension contact would increase household head level of commercialization by 1.5% than others, keeping all other factors constant. This implies that agricultural extension services enhancing farmer skills and knowledge, link farmers with modern technology and increase productivity. This is in line with the findings of [19;14].

Conclusions and Recommendations

Conclusions

The descriptive and inferential analysis indicated significant difference between wheat market participant and non-participant sample households in terms of family size, cultivated land size, area allocated for wheat production, livestock holdings, Experience wheat production, Frequency of extension contact, participation in social organization, access to market information and distance of farm from market center. The result also revealed 57.38% of sample households were market participant Wheat production. The average level Wheat commercialization was 39.4 % which was less than half indicated low level of commercialization.

The result of double hurdle model revealed that, ten variables were found significantly affected households' wheat market participation decision and intensity of wheat commercialization. These variables were experience of wheat production, family size, lagged price of wheat, access to market information and frequency of extension contact positively affected wheat market participation decision of sample household head. The level of wheat commercialization was affected by education level, wheat farming experience, lagged market price of wheat and frequency of extension contact positively while family size and livestock holding affected level of wheat commercialization negatively.

Recommendations

Based on the findings of this study, the following recommendations are made.

Access to market information significantly affected sample household head wheat market participation decision positively. The government should give price and market information by different means of information providers' instruments as well as create market integration to enhance farmers' wheat market participation decision.

Frequency of extension contact influenced sample household head wheat market participation decision and level of wheat commercialization in study area. Therefore, the agricultural development office should be to increase extension service by providing service on input and output marketing related services.

Finally Experience of wheat production influenced both market participation decision and level of wheat commercialization. Therefore, agricultural offices and research centers cooperatively arrange field days those farmers exchange their experience sharing on technology utilization that enhance market participation decision and level of commercialization.

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