

Determinants of Rural Women Participation in Farm Management Decision Making Activities: The Case of Derashe Woreda

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Abstract: *Though women have played a major role in rural households, they have not been given much power in the decision making process in intra-household farm management. The study was carried out with the objective to find out the factors affecting rural women's participation in farm management decision making process in Derashe Woreda, Segen Area Peoples Zone. The study was followed a multi-stage sampling procedure. Employing multi-stage sampling technique 183 households were interviewed to gather data. Primary quantitative data were collected using interview schedule through face- to-face interview whereas qualitative data were collected through key informant interview and focus group discussion. Descriptive, inferential and econometric analyses were carried out. the computed independent t-test for the mean income difference was statistically significant among rural women decision in participation of farm management activities, from the eleven explanatory variables entered into the model, six variables were found to be significantly determining rural women decision in participation of farm management in the study area at less than 1, and 5 percent probability levels. these are education level of the household head, land size, contact to development agent, access to media, access to training and religion significantly and positively affects rural women decision in participation of farm management activities while age, family size, access to credit, land certification and cooperative membership affects negatively and significantly women decision in participation of farm management less than 1 and 5 per cent probability levels respectively. the findings of the study are likely to be important to agricultural institutions, governments and NGOs in designing policy to empower rural women socially and economically. This study makes the valuable contribution by providing a base to the agricultural institutions for strengthening and expanding their support to rural women.*

Keywords: Agriculture, Rural Female Participation, Ordered Logit

1. Introduction

Agriculture and allied sectors are unique because of their diversity and location specific requirements, discussing adaptation of technologies to a range of agro-ecological conditions. Agriculture can be an important engine of growth and poverty reduction. But the sector is underperforming in many countries in part because women, who are often a crucial resource in agriculture and the rural economy, face constraints that reduce their productivity. Women constitute almost half of our country's population and have been the major components of the working force since from the beginning of agriculture (Amutha, 2011).

Women play a pivotal role in agricultural and rural economies in all developing countries. Their roles vary considerably between and within regions and are changing rapidly in many parts of the world, where economic and social forces are transforming the agricultural sector. Rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes (Team and Doss, 2011; Arshad *et al.* 2010; Pal, 2013).

According to Ahmed and Hussain (2004), rural women play key roles in agricultural production by working with full

passion in production of crops right from the soil preparation till postharvest activities. Aggregate data show that women comprise of around 43 percent of the agricultural labour force both globally and in developing countries (FAO, 2011).

According to National Population Office the population of Ethiopia is estimated to be 105 million of which women make up half of the total population. Around 85% of the populations live in rural areas where social services such as education and health are poor and rural women's participation in different economic activities such as agricultural work in the community is low. Though there is lack of gender data in the country, some studies show that women in rural areas work over 18 hours a day but they receive little economic benefit in return. They also have less access to education than men do. Moreover, very few women assume leadership and decision making position at all levels in the country. Given this reality the development polices, programs and projects fail to address the situation of women (NOPE, 2013).

Though women have played a major role in rural households, they have not been given much power in the decision making process in intra-household farm management. Studies have found that the intra-household bargain that affects the distribution of benefits would have repercussions on the agricultural production (Lim, Nelson and Arends-Kuenning 2007).

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Households are sites of both cooperation and contestation. With more data available at the intrahousehold level, development researchers and practitioners have increasingly focused on household dynamics and the measurement of bargaining power within the household. Substantial evidence suggests that the bargaining power of individual household members can affect outcomes experienced by households and the individuals within them (Doss, 2013). Moreover, research suggests that although bargaining power is not directly observed, it can be inferred from individual characteristics and the relationships of household members within families, communities, and social networks.

The role of women has always been a multi-dimensional and significant as women have performed well in case of agricultural activities, domestic activities, marketing activities as far as labour requirement is considered. Women empowerment was one of the Millennium Development Goals (MDGs) and still one of the goals in the new sustainable development agenda of the United Nations. (United Nations, 2017).

The decision-making process is an important segment of every household because the efficiency of family resource management depends on the efficiency of decision-making progress. So women's involvement in decision-making process has been of great importance because women play an important role in every household activity and gives excellent performance most of the time. (Mumtaz, K.A., and Aysha, N.A, 2012).

Though women in rural Ethiopia participate in economic activities they have little role in decision making particularly in matters related to agriculture farm management and financial matters. Policies on women's empowerment exist at the national, state, and local levels in many sectors, including health, education, economic opportunities, gender-based violence, and political participation. However, there are significant gaps between policy advancements and actual practice at the community level. But there were no studies that were conducted so far in the study area in relation to the title undertaking to the researcher knowledge. In this paper the researcher was examined the factors affecting the rural women's participation in decision making process of different farm management at the household level on the basis of a field study in Dirashe Woreda Segen Area Peoples Zone.

2. Methodology of the Study

2.1. Sampling Procedures

This study was employed a multi-stage sampling procedure. In the first stage, Derashe Woreda was selected purposively from five Woredas in Segene Area Peoples Zone because the researchers personal experience about the study area. In the second stage, three kebeles were selected by simple random sampling method from 16 rural kebeles existing in the study areas. Thirdly, the sample respondent was also selected by simple random technique.

According to Catherine Dawson (2009), the correct sample size in a study depends on the nature of the population and

the purpose of the study. Although, there are no general rules, the sample size usually depends on the population to be sampled. To select sample size, a list of the population who are working on the study area are residing in 2016 was obtained. Accordingly, using Yamane Taro's (1967) formula, 183 respondents were selected from the total of 1,822 households in three kebeles. The sample size for the present study was determined as follows:

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

Where:

- n = Sample Size
- N = Total Population = 1822
- e = Margin of Error 7%
- 1 = Constant Number
- A 93% confidence levels are assumed

$$n = \frac{1822}{1 + 1822(0.07)^2} = \frac{1822}{1 + 8.9278} = 183$$

Accordingly, 183 respondents were selected from the total of 3 kebeles of rural household heads. Those respondents were selected from Walayete kebele, Layigawo arguba kebele and, Onota kebele on proportional basis. Therefore, [(812/1822) x 183] = 81, Walayete out of 812, [(336/1822) x 183] = 34 Layigawo arguba out of 336, [(674/1822) x 183] = 68 Onota out of 674 rural household heads were selected.

2.2. Method of Data Analysis

2.2.1 Descriptive Analysis

The first objective of the study was analyzed by using descriptive statistics (such as percentage and frequency) were used in order to enhance and make meaningful analysis and interpretation of the research output. The Second objective of the study was analyzed by using Participation index (PI), then frequency and percentage. The third objective of the study was analyzed by using ordered logit model because the dependent variable which is participation in decision making can be taken place from as actively involved, opinion considered, only consulted and no consideration decision making level which order characteristics.

2.2.2 Econometrics Analysis

The indicators of activities used for this analysis include rural woman participation in farm management decision making process of different activities. The respondents were asked to what extent they were participating in those activities. This was based on their intervention as actively involved, opinion considered, only consulted and no consideration. Point was awarded for each response with sufficient scoring values as 3, 2, 1 and 0 respectively. The frequency counts of responses have been recorded to compute the Participation Index (PI) of rural women for each of the selected activities. Then Participation Index for each individual activity has been computed by using the following formula;

$$PI = (N_1X_1) + (N_2X_2) + (N_3X_3) + (N_4X_4) \text{ Where:}$$

PI=Participation Index for different activities of participation in the farm management decision making process.

N_1 =Number of rural women who actively participate
 N_2 =Number of rural women who participate in opinion considered
 N_3 =Number of rural women who participate in only consulted
 N_4 =Number of rural women who never Participate (no consideration)

Participation Index described above expresses to what extent rural women were involved in each activity of a given farm management decision making activities. But in order to measure the status of rural women decision in participation of farm management as a general, the scores of these activities were calculated for each respondent and converted them in to significant index value as Tilahun (2008) and Roman (2010). In order to achieve the third objective, “to identify factors that affect the rural women farm management decision making process in the study area”, ordered logit model was employed.

2.2.2.1 Ordinal Logit Model

The ordered logit model was employed due to the ordered nature of the dependent variable. Use of appropriate model is usually determined by the nature of the dependent variable or variables. In this study dependent variable has categorical or ordered nature. Then ordinary linear regression is not appropriate because of the non- interval nature of the variable and the spacing of the outcome choices cannot be uniform. Ordinal logit and probit models have been widely used to analyze such types of data (Liao,1994).

Some polychotomous dependent variables are inherently ordered. Although the outcome is discrete, the multinomial logit or probit models would fail to account for the ordinal nature of the dependent variable (Greene, 2008). The ordered probit and logit models have come in to fairly wide use as a frame work for analyzing such responses (Zavoina and Macelvey, 1975). Hence, the Ordered Logit Model will be used to assess the factors affecting rural women participation in farm management decision making process having three distinct categories. That is low(0-11), medium(12-22) and high (23-33) participation categories.

2.2.2.2 Model Specification

By following Green (2008) and Liao (1994) the functional form of ordinal logit model is specified as follows:

$$y^* = \sum_{k=1}^k \beta_k + s \tag{1}$$

y^* = is unobserved and thus can be thought of as the underlying tendency of an observed phenomenon s = is assumed it follows a certain symmetric distribution with

zero means such as normal or logistic distribution. What it is observed is

$$\begin{aligned} y &= 1 \text{ if } y^* \leq \mu_1 \\ y &= 2 \text{ if } \mu_1 < y^* \leq \mu_2 \\ y &= 3 \text{ if } \mu_2 < y^* \leq \mu_3 \\ y &= j \text{ if } \mu_{j-1} < y^* \end{aligned} \tag{2}$$

Where y is observed in j number of ordered categories, μ_c are unknown threshold parameters separating the adjacent categories to be estimated with β_c . The general form of the probability that the observed y falls into category j and μ_c and the β_c are to be estimated with an ordinal logit model is

$$\text{Prob}(y=j) = \frac{e^{-\beta_j(\mu_{j-1} - \sum \beta_k x_k)}}{1 + \sum_{k=1}^K e^{-\beta_k(\mu_{k-1} - \sum \beta_k x_k)}} \tag{3}$$

Where $L(\cdot)$ represents cumulative logistic distribution. The Odds ratio on each participation status is calculated by

$$\frac{\text{prob}(Y=j)}{\text{prob}(Y=k)} = \frac{e^{-\beta_j(\mu_{j-1} - \sum \beta_k x_k)}}{e^{-\beta_k(\mu_{k-1} - \sum \beta_k x_k)}} \tag{4}$$

Where $f(\cdot)$ represents the probability density function

3. Empirical Result and Discussion

3.1 The Results of Cross Tabulation and Its Interpretation

3.1.1 Educational Level of the Respondents (EDL)

Education affects positively and significantly rural women’s participation in farm management decision making activities at less than 1% probability level. The implication is that education status of rural women enable them acquires knowledge and skill and this in turn increases their productivity. Besides, education level of farmers was assumed to increase their ability to obtain productive loan information and their participation in farm management activities. In descriptive part analysis, result of the study reveals that 52(28.4 %) of the client rural women can’t read and write, 63(34.4%) rural women completed primary education and the rest 68(37.2%) of the respondents completed secondary education. The t- value shows that there was significant mean variation in education level rural women participation in farm management decision making at 5% significant level. Educated rural women farmers have better chance to adopt new ideas that is to be participation in farm management decision making. Therefore, education has its own influence on rural women’s participation in farm management decision making.

Table 1: Education of Respondent * Rural Women Participation Cross Tabulation

Variables	Category	Rural Women Participation			Total	t-value	
		Low	Medium	high			
education of respondent	can't read write	Count	38	0	14	2.417**	
		% of Total	20.80%	0.00%	7.70%		28.40%
	primary education	Count	57	0	6		63
		% of Total	31.10%	0.00%	3.30%		34.40%
	secondary education	Count	60	1	7		68
		% of Total	32.80%	0.50%	3.80%		37.20%
Total	Count	155	1	27	183		
	% of Total	84.70%	0.50%	14.80%	100.00%		

Source: Own field survey (2019), P-value = 0.017 **, Significant at 5% level.

3.1.2 Access to Training (acctrain)

The survey results obtained from the respondents' household in the Table 2 shows that from the total respondents 57.9% did attended on training that focused on farm management decision making related practice. However, out of the total rural women respondents (42.1%) did not attended on training that focused on farm management decision making related practice. FGD held with the selected discussants some individuals who have

participated in the training complained that the training was very shallow and it was like orientation held most often for one or two days. Hence, it seems that it is difficult to see promising behavioral change and enabling farmers to have effective participation with such short period of training program. Therefore, training has its own influence on rural women participation on farm management decision making at 1% significance level.

Table 2: Access to training * Rural Women Participation Cross tabulation

Variables	Category	Rural Women Participation			Total	Chi -square	
		low	medium	High			
Access to training	No	Count	49	1	13	45.509***	
		% of Total	26.80%	0.50%	7.10%		42.10%
	yes	Count	106	0	14		106
		% of Total	57.90%	0.00%	7.70%		57.90%
Total	Count	155	1	27	183		
	% of Total	84.70%	0.50%	14.80%	100.00%		

Source: Own field survey (2019) P-value = 0.000 ***, Significant at 1% level.

3.1.3 Contact with Development Agent

The results in the Table 3, show that from the total respondents 77.6% contact >1 times per month with Development Agents, 1.1% of the respondents contact twice per month, 1.6% of the respondents contact more than twice per month and 19.7% of the respondents have no

contact to development agents. The t-value shows that at 1% significance level, there was significant mean in the number of contact with development agents in rural women respondents. Therefore, ineffective awareness status of extension service has its own influence on rural women participation in farm management decision making.

Table 3: Contact to Development Agent * Rural Women Participation Cross Tabulation

Variables	Category	Rural Women Participation			total	Chi -square
		Low	medium	High		
contact to development agent	0 no contact	28	23	19	70	0.000***
	one contact/ month	18	29	7	54	
	2 contact/month	16	27	5	48	
	more than 2 contact/month	0.5	0.5	1	11	
	Total	63	84	32	183	

Source: own field survey (2019) P-value = 0.000 ***, Significant at 1% level

3.1.4 Farm Size (FmS)

The result in Table 4 reveals that from the total respondents 48.6% have land holding size 1-3 hectare, 38.3% have land holding size 4-6 hectare and 13.1% have land holding size above 6 hectare. Here as the data was indicated the participation of rural women farmers is very high which holds 48.6%. As the size of rural women farmers land holding size increase the participation on farm management decision making become decrease. The t-value shows that there was significant mean of the land holding size of rural women respondents at 1% significance level.

Table 4: Farm Size * Rural Women Participation Cross Tabulation

Variables	Category	Rural Women Participation			Total	t-value
		Low	medium	High		
farm size	1-3	Count	62	0	27	-5.546***
		% of Total	33.90%	0.00%	14.80%	
	4-6	Count	69	1	0	
		% of Total	37.70%	0.50%	0.00%	
	>6	Count	24	0	0	
		% of Total	13.10%	0.00%	0.00%	
Total	Count	155	1	27	183	
	% of Total	84.70%	0.50%	14.80%	100.00%	

Source: own field survey (2019) P-value = 0.000***, Significant at 1% level

3.1.5 Access to Media (accm)

Most of the respondents replied that they had no access to media to expand and upgrade their farm management decision making process. This shows that access to media was one of the institutional constraints of rural women farmers. As it was seen in the Table 5, about 78.7 % of the respondents were did not have access to media while 21.3%

did have access to media certification. The Chi-square value shows that there was significant relationship between those who have access to media and rural women participation on farm management decision making process at 1% significance level. Therefore, access to media has its own influence on rural women participation on farm management decision making process in study area.

Table 5: Access to Media * Rural Women Participation Cross tabulation

Variables	Category	Rural Women Participation			Total	Chi -square
		low	medium	high		
access to media	Yes	Count	11	1	27	1.221***
		% of Total	6.00%	0.50%	14.80%	
	no	Count	144	0	0	
		% of Total	78.70%	0.00%	0.00%	
Total	Count	155	1	27	183	
	% of Total	84.70%	0.50%	14.80%	100.00%	

Source: Own field survey (2019) P-value = 0.000***, Significant at 1% level

3.1.6 Religion of Rural Women (RRW)

As it was shown in the above Table 6, about 78.1% of the rural women respondents were the followers of orthodox religion and the remaining 21.9% were become protestant. The Chi-square value shows that there was significant

relationship between religion and rural women participation on farm management decision making process at 1% significance level. Therefore, religion has its own influence on rural women participation on farm management decision making process in study area.

Table 6: Religion of rural women * Rural Women Participation Cross tabulation

Variables	Category	Rural Women Participation			Total	Chi-square
		low	medium	High		
Religion of rural women	for orthodox follower	Count	116	0	27	12.118***
		% of Total	63.40%	0.00%	14.80%	
	for protestant follower	Count	39	1	0	
		% of Total	21.30%	0.50%	0.00%	
Total	Count	155	1	27	183	
	% of Total	84.70%	0.50%	14.80%	100.00%	

Source: own field survey (2019) P-value = 0.002***, Significant at 1% level

3.2. Determinants of Rural Women's Participation in Farm Management Decision Making

Multicollinearity test were conducted into Statistical Package for Social Sciences (SPSS) program for parametric estimates of Ordinal Logit Regression model. Model fitting and goodness-of-fit statistics ($\chi^2 = 205.6$, $df = 11$, $p = 0.000$ and $\chi^2 = 366.652$, $p = 0.899$) show that the likelihood ratio for all explanatory variables are different from zero and the model fits the data very well. A total of 11 variables which were believed to have influence on women decision in participation of farm management entered into the model. The result presented in Table 12 shows that six variables were found to have significant influence on rural women participation on farm management decision making

process at different probability level. That is access to media, , farm size, contact to development agents, access to training and religion of rural women was significant at less than one percent probability level; whereas Education were significant at less than five percent probability level.

Education Level: This variable is a continuous variable. Education can play crucial role on participation and management of cooperatives. It is likely that educated farmers have more readily to understand and may be easier to train through extension support. It is expected to positive relationship with the rural women participation on farm management decision making process. In agreement with this, Riddell *et al.*, (2012) have reported in their study that highly educated workers tend to adopt new idea faster than

those with less education workers. Therefore, the formal education increases the participation of farmers.

Farm Size (LSZ): The model result reveals that farm size was positively and significantly affects rural women participation in decision making process at less than one percent probability level, The possible implication in that as women have land, she can produce more from her landholding. Similarly, the results of the study by Daniel and Yirgalem (2016) had also revealed that farmers with the for land. A woman facing the problem of low level of production due to shortage of farmland and limited use of modern farm technologies would increase her productivity through the use of fertilizer and other improved farm inputs. This forces women for searching credits and saving institutions or individuals and groups. This result is also consistent with studies carried out by Daniel and Yirgalem (2016).

Access to Media (AM): It represent whether the sample respondents were generating media information about agricultural issues or not and determine factors affecting the rural household heads participation in farm management decision making process *positively*. Therefore, the variable is significant at 1% level and influence the dependent variable positively.

Contact with Development Agent: It is a continuous variable and measured in number of contact per month. It is expected to have positive relationship with rural women participation in farm management decision making process in agreement with this, EDRI (2012) has suggested in its study that, receiving advice from development agents and the perceived usefulness of development agent advice are major factors that explain the likelihood of new idea adoption rate from the total respondents. The t-value shows that at 1% significance level, there was significant mean in the number of contact with development agents in rural women respondents. Therefore, ineffective awareness status of extension service has its own influence on rural women participation in farm management decision making process.

Religion: The rural women respondents were the followers of orthodox religion and the remaining 21.9% were become protestant. The Chi-square value shows that there was significant relationship between religion and rural women participation on farm management decision making process at 1% significance level. Therefore, religion has its own influence on rural women participation on farm management decision making process in study area.

Access to Training (acctrain): This includes farmers'' attending on training that focused on fruit and vegetable cooperatives related activities. It is a dummy variable. It is expected to have positive relationship with the Participation on training and education improves farmers'' knowledge and skills and which improves status of their participation in rural women participation in farm management decision making process. In agreement with this, Tsionet *al.* (2010) the emphasis in extension education is on helping people to help themselves. Hence extension service is an on-going process of getting useful information and disseminate to people and assisting them to acquire the necessary

knowledge, skills and attitudes. Therefore, training has its own influence on rural women participation on farm management decision making at 1% significance level.

Table 7: Parameter Estimate of the Ordinal Logistic Regression Model Results

Variables		Estimate	Std. Error	Wald	Exp (β)
Dependent RWP	Low	-1.328	.707	3.525	.060
	Medium	-.257	.698	.136	.713
	High	1.412	.566	.142	.623
Independent Variables					
Age		-0.214	.707	3.525	.060
Access to media		0.000***	.698	.136	.713
Family size		-0.142	.566	.142	.623
Land certification		-0.588	.754	2.196	.138
Education		0.017**	.577	3.127	.000
Access to credit		0.513	.248	.001	.973
Farm size		0.000***	1.078	.818	.366
Contact to dev.t agent		0.000***	.247	.521	.470
Access to training		-0.000***	.250	2.650	.104
Membership in cooperative		-0.544	.321	.718	.397
Religion		0.002***	.514	.330	.565

Model-2log likelihood = 273.204, Chi-square = 55.318, df=11, P= 0.000

Goodness-of-fit chi-square = 253.161, p = 0.657

*Note: *** and ** Significant at <1% and 5% probability le*

4. Conclusion and Policy Implication

According to the result of the study, on the bases of Participation Index, (84) or 45 percent of the respondents were in the highest participation category (61) or 34.3 percent of the sampled respondents were in the medium and (38) or 20.7 percent were in the low level of participation category in farm management decision making activities .

Empirical analysis result reveals that different factors influenced women's decision in participation of farm management decision making activities in the study area. Age of the respondents, family size, access to credit, cooperative membership and land certification were important variables determining the participation level of rural women participation in farm management decision making activities. The result of the study shows that, Education, access to media, access to training, contact to development agent, farm size, and religion affects positively and significantly the probability of rural women participation in farm management decision making activities .

Recognition of rural women's role and contribution to social and economic development in general and that of agricultural development in particular by planners and decision makers would help to enhance the status of women and increase food security at household and national level.

The secret of success of the Woreda lies in enhancing the level of education of rural women; by educating a rural women, the whole family, the entire society or the whole population is educated; sound moral and social values becomes a reality.

It's necessary to increase rural women's political participation to address issues related to equality. Such improvement helps to reduce the gap between rural men and women in economic, decision making power and employment opportunity.

It's important to raise rural women's consciousness through participation and by organizing themselves. It can also be facilitated through education, capacity building, training and other measures. Change has to come in the structures and legal frameworks in order to make the self-transformation process of empowerment sustainable.

Since the contribution of rural women in reducing poverty and hunger is as important as men, the Woreda concerned body essentially promote to empower rural women status for making decision on all economic and income generating activities. The woreda political leaders and decision makers better to facilitate financial services such as micro-financial institutions to disadvantaged rural women to enhance their ability of generating income to ensure the well-being of their families.

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