

Analysis of Female Headed Households' Participation in Agricultural Extension Package Program in East Showa Zone, Ethiopia

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Abstract

The study was conducted at four Districts of East Showa Zone namely Dugda, Ada'a, Bosset and Fentale Districts with an objective of assessing female headed households' (FHHLs) participation in agricultural extension package program and assessing major constraints to participation in agricultural extension packages. Four representative districts were selected purposively and two kebeles were selected per the districts randomly. A total of 129 respondents were drawn for interview. The data were collected through structured household survey, key informant interview and focus group discussion. Qualitative and quantitative types of data were used for the study. The data were analyzed by using descriptive and inferential statistics. The study result showed that participation of female headed households of the zone in agricultural extension package program is very low (only 44.4% of households participated in one or more package of agricultural technology whereas the majority (56.6%) of respondents did not participate in agricultural extension package program available in the zone) during the two years from the survey period. The study identified that inputs supply related problems, lack of capability to purchase inputs, low level of awareness towards technology recommendations and biasness of development workers towards progressive farmers while input delivery processes were among the constraints to participation. Correlation analysis is also employed to see the association between variables. The result of Cramer's V test showed that oxen ownership (p -value < 0.05), access to radio (p -value < 0.05), extension contact (p -value < 0.01), access to training ($p < 0.05$), field days (p -value < 0.05) and access to credit services (p -value < 0.01) are positively and significantly correlated with households' participation in agricultural extension package. There is a

need to strengthening extension contact so as to minimize the skills and knowledge gaps, improving input supply mechanisms, improving utilization of technology recommendations through awareness creation, diversifying households' sources of income, improving households' access to and utilization of credit services. It is further recommended that strengthening households' access to effective training and facilitating households to use the skills and knowledge developed from training by giving attention to other factors that favor participation.

Key words: Female Headed Households, Participation, Agricultural extension package

Citation: Gurmessa Umeta. Analysis of female headed households participation in agricultural extension package program in East Showa Zone, Ethiopia. American Journal of Research Communication, 2013, 1(8): 227-245} www.usa-journals.com, ISSN: 2325-4076.

List of Abbreviations and Acronyms

ATARC	Adami Tulu Agricultural Research Center
CSA	Central Statistical Agency
DA	Development Agent
EEA	Ethiopian Economics Association
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focused Group Discussion
FTC	Farmers Training Center
FHHLDs	Female Headed Households
Ha	Hectare
MoA	Ministry of Agriculture
MoARD	Ministry of Agriculture and Rural Development
WoARD	Woreda of Office Agriculture and Rural Development
PASDEP	The Plan for Accelerated and Sustainable Development to End Poverty
PPS	Probability Proportionate to Size
TV	Television
UNDP	United Nation Development Program

1. Introduction

1.1. Background of the study

Extension has been recently defined as “systems that facilitate the access of farmers, their organizations and other market actors to knowledge, information and technologies; facilitate their interaction with partners in research, education, agribusiness, and other relevant institutions; and assist them to develop their own technical, organizational and management skills and practices” (Christoplos, 2010). Agricultural extension is a high government priority in Ethiopia, but coverage of extension services is widely varied across regions. Accordingly, access to extension services in Ethiopia varied widely across regions, ranging from 2 percent in Afar to 54 percent in Tigray region (EEA, 2007).

Women in Ethiopia as anywhere else occupy the law status in the society. Although they represent 49.8% of the population and contribute mainly to food production and others, they have not shared the fruits of development equally with their male counterpart. Rights such as, access to land, technology, credit and other productive resources are difficult for women to attain (Ethiopian women's affairs sub-sector national report, 2004). The gender gap in access to extension services and technology adoption is the other problem. Furthermore, development workers tend to work with better-off farmers and male farmers (World Bank, 2010).

Gender related constraints reflect gender inequalities in access to resources and development opportunities. Although class, poverty, ethnicity and physical location may influence these inequalities, the gender factor tends to make them more severe (Kabeer, 2003). Despite the significant roles women play in agriculture and food security in many developing countries, they continue to have a poorer command over a range of productive resources, including education, land, information, and financial resources (World Bank 2001; Odame *et al.*, 2002; Welch *et al.*, 2000). I line with this, female headed households are more limited to and control over resources (Addis *et al.*, 2001). There are also differences in terms of access to and control over resources and decision making between female headed households. Women are economically and socially disadvantaged, such differences found mainly between male headed households and Female headed

households. Differences are also expected to exist between women in the Female headed households and Male headed households, which deserve special attention (Tiruneh, *et al.*, 2001). In Ethiopia, to improve women farmers' access to extension services, the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) targeted to reach all female headed households and 30% married women in agricultural extension program. In order to achieve the above mentioned targets, the women affairs in the department in the Ministry of Agriculture and Rural Development (MoARD) have been engaged in different activities which help to address properly the implementation of the program (UNDP, 2007/8). In addition, gender mainstreaming guideline has been developed in order to mainstream women needs in different development program and projects which has been taking in agricultural sector (UNDP, 2007/8). In the study area different efforts have been undertaking to increase households' participation in agricultural extension package program. But, no research findings available that shows the status of female headed households' participation in agricultural extension package program. Therefore, this piece of study was proposed to see the status of female headed households' participation in agricultural extension package program. The study result can contribute to the improvement of the existing situation related to Female headed households' participation in agricultural extension package program through drawing policy recommendation.

Objectives of the study

- To analyze participation of female headed households in agricultural extension package program
- To analyze constraints to participation in agricultural extension package program

2. Methodology

2.1. Description of the Study Area

The study is conducted at East Showa Zone of Oromia regional state, Ethiopia. Four Districts namely; Dugda, Ada'a, Bosset and Fentale were selected purposively based on farming systems of the zone.

2.2. Sample Size and Method of Sampling

A total of 129 female headed households were drawn from the four Districts. In this context, female headed households are those women farmers in which a husband is not present due to divorce, disabled and death. The sampled Kebeles were selected randomly by using lottery methods. Sampling frame was taken from respective Districts Office of Agriculture and Rural Development and Development Agents. Probability proportionate to sample size (PPS) technique was employed to determine size of respondents from the sampled kebeles. Respondents were selected by using probability sampling technique (systematic random sampling techniques).

2.3. Sources and Types of Data

Data were collected from primary and secondary sources. Primary data were collected from respondents. Secondary data were collected from BoARD and relevant literatures. Qualitative and quantitative types of data were employed for this study.

2.4. Methods of Data Collection and analysis

Questionnaires were pre-tested with randomly selected farmers. Afterward, some modification was made. A combination of data collection methods was employed. Accordingly, household interview schedule, key informant interviews and focus group discussion were used. After the data were collected, it was edited, entered into the computer and cleared for analysis. The data was analyzed by using SPSS 13 version. Descriptive statistics like mean, standard deviation, frequency, ch-square tests, and independent sample t-test were employed for analysis.

3. Result and Discussion

In East Showa Zone, there are huge number of female headed households whose livelihoods depend on agriculture. According to the data taken from zonal oARD showed, the number of male headed households was estimated at 149,301 whereas the number of female headed households was estimated at 21,078 (calculated from Zonal oARD data, 2009). This figure can indicate that the numbers of female headed households residing in

the Zone are huge in numbers.



Figure 1: A sample of picture showing while interview was conducting at FTC.

3.1. House holds' demographic characteristics

3.1.1. Age of respondents

Based on frequency analysis result, the majority of respondents selected for an interview are found between an age category of 42 and 62 years old followed by the age category between 21 and 41 years old (Table1).

Table1. Age of respondents

Age category	Proportion of HHLD (%)
1-20	1.6
21-41	38.2
42-62	47.2
> 62	13
Total	100

Source: own survey result

Chi-square test was employed to analyze the association between age of respondents and participation in agricultural extension package program. As indicated by chi-square test result, there is a relationship between age of respondents and joining of extension package program ($\chi^2=0.700$, $df= 3= p = 0.873$) but, their relationship is not significant.

Furthermore, Cramer's V test reported that there is positive relationship between age and joining of extension package program but, their relationship is not significant (Table 2).

Table 2. Relationship between age of respondents and extension participation

Age category	Proportion (%)	Chi-square		Cramer's V		
		Value	p-value	value	p-value	df
1-20	1.6					
21-41	38.2					
42-62	47.2					
>62	13					
Total	100	0.60	0.89	0.071	0.89	3

Source: own survey result

3.1.2. Households' level of schooling

According to frequency analysis result showed, 96.9 %, 66.7%, 79.1% and 75 % of respondents' are illiterate respectively for Fentale, Dugda, Ada'a and Boset Districts. This study result showed that across the sampled Districts, the majorities of respondents are found to be illiterate. Illiteracy is high at Fentale District followed by Ada'a and Boset Districts (Table 3). This high level of illiteracy can result in low level of technology adoption.

Table 3. Respondents' level of schooling across the Districts

Level of schooling	Name of the Districts			
	Dugda(%)	Ada'a(%)	Bosset(%)	Fentale(%)
1-4	14.8	9.3	4.2	-
4-7	3.7	4.7	4.2	-
7-12	7.4	2.3	8.3	-
>12	-	-	-	3.1
Adult education	7.4	4.7	8.3	-
Illiterate	66.7	79.1	75.0	96.9

Source: own survey result, 2009

3.1.3. Households' farming experience

Households farming experience is vary between and among the sampled farming communities. The maximum households farming experience reported across the District was 61 years whereas the minimum farming experience reported among the District was two years (Table 4). There was no significant difference reported among the Districts in terms of farming experience ($F=0.106$, $df= 3$, $p= 0.956$).

Table 4. Respondents farming experience across the Districts

Districts	n	Mean	Std. Deviation	F	df	p-value
Dugda	27	25.22	14.19			
Ada'a	41	25.04	14.69			
Bosset	25	26.84	11.56			
Fentale	28	25.39	10.98			
Total	121	25.53	13.03	0.106	3	0.956

Source: own survey result

Pearson correlation analysis showed that there is positive relationship between farming experience and joining of extension package program but their relationship is not significant ($r=0.06$, $p = 0.952$).

3.2. Socio-economic characteristics of respondents

3.2.1. House holds' farm size

Land is one of the important production factors. According to analysis result showed, better land size was reported at Dugda District followed by Ada'a and Bosset Districts whereas the least land size owned by respondents was reported at Fentale District, but for Fentale District the land re-distribution is under way during the survey time. The mean difference found among the four Districts is found to be significant at 1% significance level ($df=3$, $F=10.09$, $p = 0.000$). Furthermore, the study result indicated that, there is variability among the Districts in terms of land size (Table 5). The figure of land size owned by female headed households for the three districts is somewhat similar with the

result of the studies conducted at other parts of the country like the study conducted by Catherine R. *et.al.*, (2012) who reported that the mean land size owned by Ethiopian Female headed households is 0.90 ha. The presence of this difference may be due to the fact that the sampled districts are found in low land area.

Table 5. Land size owned by respondents across the Districts

Districts	n	Mean(ha)	Std. Deviation	F	p-value
Dugda	28	2.08	1.42		
Ada'a	44	1.57	0.93	10.09	0.000
Bosset	25	1.41	0.97		
Fentale	32	0.68	0.62		

Source: own survey result

3.2.2. Oxen ownership

As indicated by table 6, the majority of respondents owned oxen (either single or pair of oxen) except for Fentale District. Respondents at Ada'a and Bosset Districts are better access to oxen than the other two Districts. Chi-square test result indicated that there is a relationship between oxen ownership and participation. Their relationship is positive and significant at 5% significant level ($\chi^2=6.51$, $p=0.011$).

Table 6. Relationship between participation in extension package program & oxen ownership

Districts	Response		Chi-square		Cramer's V	
	Yes(%)	No(%)	Value	p-value	Value	p-value
Dugda	36.6	65.4				
Ada'a	54.5	45.5				
Bosset	60	40				
Fentale	50	50	6.51	0.011	0.229	0.011

Source: own survey result

Cramer's V tests were also employed to see the association between joining of extension package program and oxen ownership. The result of the analysis therefore showed that there is positive and significant relationship between oxen ownership and joining of extension package program at 5% probability level. This may indicate that access to oxen can favor respondents' participation in extension package program.

3.2.3. Respondents' major sources of income

The agricultural extension systems aims to transfer technologies and capacities that should impact on farmers' production and productivity and finally increase farmers' income. Households' income is one of the factors determining joining of extension package program. So, this study assessed farmers' major sources of income & their level of income as well. The major households' sources of income identified are; crop production, livestock production, off-farm and non-farm activities. The income generated from these sources of income is discussed as under.

3.2.4. Average annual income generated by respondents from sell of crops

Crop production is one of the major livelihood options for the farmers of the zone. Accordingly, crop production can be considered as source of income and food. Respondents' level of income was assessed by the study. The study result showed that high income was obtained at Ada'a District followed by Bosset District whereas the least annual level of income was reported at Fentale District. This may be due to the fact that crop production is recently introduced at Fentale District following the embellishment of irrigation scheme (Table 7). In line with this, analysis of variance was undertaken to see whether a statistical difference is there or not. Accordingly, there is a significant difference between the Districts in terms of income size generated from sell of crops at 1% significance level ($df=3$, $F=4.01$, $p = 0.009$). This result can indicate that female headed households' access to productive resource is very low which needs to be given due to attention.

Table 7. Average households' annual income generated from sell of crops

District name	Mean	Std. Dev.	F- value	df.	p-value
Dugda	2402.85	3684.87			
Ada'a	1043.25	1846.0			
Bosset	3382.00	7341.00	4.01	3	0.009
Fentale	175.00	504.81			

Source: own survey result

3.2.5. Average annual income generated from sell of livestock

The other source of income studied is livestock production. This enterprise is one of the other sources of livelihoods. The mean annual income generated from sell of livestock is assessed by this study. According to the study result, the mean annual income obtained from sell of crops by respondents is high at Fentale District followed by Ada'a and Bosset Districts whereas the least mean of income obtained from sell of livestock was found at Dugda District. But, their mean difference is not significant. The result of F-test may indicate that the average annual income size generated by respondents of the zone from sell of livestock is almost similar. This income size is very low and this can be one of an indication of less access to productive resources (Table 8).

Table 8. Average annual income generated by households from sell of livestock

Districts	n	Mean	Std. Dev.	F-value	p-value
Dugda	27	265.40	470.21		
Ada'a	44	678.15	2051.47		
Bosset	25	403.20	1015.37	1.470	0.226
Fentale	31	1036.22	1525.61		

Source: own survey result

3.2.6. Respondents' annual income generation from off-farm activities

Off-farm activity is the other activity that respondents identified as one of the livelihood activity. Based on the frequency analysis result respondents participation in off-farm activity is high for Bosset (33.3%) District followed by Ada'a (27.9%), Dugda (17.9%) and Fentale (9.4%) District. Cramer's V analysis result showed that there is a positive

relationship between respondents' participation and participation in extension package program (Cramer's $V = 0.008$, $p = 0.933$). The mean of income generated from off-farm activity is also assessed by this study. The mean annual level of income generated from off-farm activity is slightly strong at Ada'a followed by Bosset, Dugda and Fentale District (Table 9). But, there is no significant difference reported among the Districts ($F=1.826$, $p = 0.146$).

Table 9. Average annual income generated from off- farm activities

Districts	Mean	Std. Dev	F-test	df	p-value
Dugda					
Ada'a					
Bosset					
Fentale			1.826	3	0.146

Source: own survey result

3.2.7. Utilization of credit services

Farmers who have an access of credit services can overcome financial problem and can participate in agricultural extension package program. Utilization of credit services can increase production and productivity of farmers. But, lack of access to credit services is among the factors that can limit households to increase production and productivity. So, this study assessed utilization of credit services for crop production. The result of the study showed that the majority of respondents were not used credit services during the two years from the survey period. This can be associated with different factors including; lack of collateral, fair of risks in terms of failures and lack of attention given for this households by credit providers. As indicated by correlation analysis, the relationship between access to credit services and joining of extension package program is positively correlated and highly significant at 1% probability level (Table11). This shows that access to credit services can increase households' participation in agricultural extension package program.

Table11. Relationship between access to credit and joining of extension package program

Districts	Response		Chi- square		Cramer's V	
	Yes(%)	No(%)	Value	p	Value	p
Dugda	46.4	53.6				
Ada'a	45.5	54.5				
Bosset	24	76				
Fentale	38.7	61.3				
Total	100	100	12.83	0.00	0.319	0.000

Source: own survey result

3.3. Respondents participation in extension package program

Dummy variable (Yes/No answers) was used to assess households' participation in agricultural extension packages program. Participation in this case was defined as if a respondents received and adopt a given agricultural technologies available in the area since two years before the survey period whereas, non-participant in this case was defined as if a respondent did not receive a given agricultural technologies. According to the study result showed, 55.6% of respondents did not participate in any of extension package available in the area during the two years from the survey period whereas 44.4% of respondents participated in any of extension packages.

In connection to this, constraints to participation in agricultural extension package program were identified by this study. Accordingly, the study was identified constraints to crop production technologies, livestock production technologies and access to fertilizer. Based on these, respondents expressed that cost of improved seed variety was not affordable, improved seed was in accessible (low supply related problem), low level of awareness about technology recommendations are among the major problems identified by the study (Table12).

Table 12. Constraints to utilization of crop production technologies

No.	Type of problems	Responses		
		Yes(%)	No(%)	Total
1	Low supply problems	44.2	55.8	100
2	Improved seed is not timely available	13.5	6.5	100
3	Poor quality (seed)	3.8	96.2	100
4	Cost of improved seeds is expensive	54.7	45.3	100
5	Low level of awareness towards the technology recommendation	16	84	100
6	Biasness towards progressive farmers	4.7	95.3	100

Source: own survey result

With regard to fertilizer, 44.8% of respondents applied chemical fertilizers (either one or a combination of UREA and DAP) where as 55.2% respondents were not used fertilizers during the two years from the survey period (table 13). This indicates that the majorities of respondents were not used chemical fertilizers. In connection to this, the rate of application was not as per the research recommendation.

Table 13. Constraints to utilization of fertilizer

No.	Type of problems	Response		
		Yes(%)	No(%)	Total
1	Low supply related problems	24.5	75.5	100
2	Fertilizer was not timely available	12.4	87.6	100
3	Cost of fertilizer was not affordable	64.2	35.8	100
4	Low level of awareness towards the technology recommendation	17.1	82.9	100
5	Biasness towards progressive farmers	4.8	95.2	100

Source: own survey result

With regard to livestock technologies available in the Districts, the majority of respondents were expressed that cost of the inputs was not affordable (64.2%), 40% of

respondents expressed that there was supply related problems and 17.1% of respondents expressed as low level of awareness towards the technology recommendations (Table 14).

Table 14. Constraints to utilization of livestock production technologies

No	Type of problems	Response		
		Yes(%)	No(%)	Total
1	Low supply related problems	24.5	75.5	100
2	Input is not timely available	12.4	87.6	100
3	Cost of input is not affordable	64.2	35.8	100
4	Low level of awareness towards the	17.1	82.9	100
5	Technology recommendation			
6	Biasness towards progressive farmers	4.8	95.2	100

Source: own survey result

3.4. Extension contact

Extension contact is one of the determinant factors to increase production and productivity of farmers through performing multiple roles like updating farmers' knowledge and skills, linking farmers with input suppliers and marketing institutions. The study therefore tried to see proportion of extension contact made for respondents during the survey year. The survey result showed that, the existing extension contacts was found to be very weak. Chi-square analysis was also employed to see the association between extension contact and participation. The result showed that there is a relationship between extension contact and participation at p-value < 0.01. Cramer's V test showed that, there is positive and significant relationship between extension cand female contact and participation at 1% probability level (Table 15). This somehow may indicate the importance of the extension contact to increase participation.

Table 15. Proportion of respondents who ever contacted by development agents during the survey period

Districts	Response		Chi- square		Cramer's V	
	Yes(%)	No(%)	Value	P-value	Value	P-value
Dugda	11.4	26.7				
Ada'a	28.6	34.4				
Bosset	22.9	18.9				
Fentale	37.1	20	8.72	0.03	0.26	0.003

Source: own survey result, 2009, correlation is significant at 1% probability level

3.5. Access to extension events (training, field day and demonstration)

Farmers ability to use their land effectively can be influenced by access to technology, research, change agents and marketing. Some of these factors can be alleviated through provision of adequate training. Training is one of the most important components of an agricultural extension services available in the Districts. Therefore, access to training by respondents was assessed. The result of the study showed that participation of female headed house holds in extension events like training, field days and demonstration is very low across the District (figure 2).

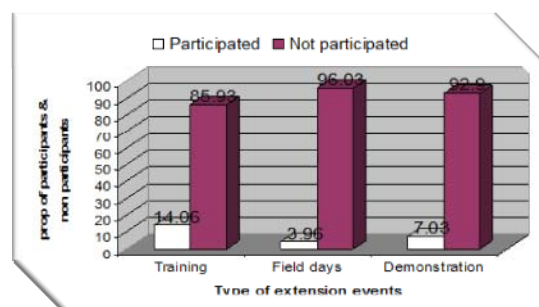


Figure 2: Proportion of respondents participated on extension events

Correlation test was also employed to see the relationship between respondents' participation on extension package program and participation on the extension events. According to Cramer's V test result shows, women participation in extension events such as field days and training have positive and significant relationship with joining of

extension package program at 1% and 5% respectively for field day & training. But no significant relationship was reported for demonstration and participation.

3.5. Respondents' access to other sources of information

Access to other sources of information like radio, television and extension materials can create farmers awareness which finally increase farmers decision to participate in agricultural program. So, the study assessed the proportion of respondents accessed to these sources of information. Frequency analysis summarized that 59.4%, 93% and 98.4% of respondents had no access to radio, TV and extension material respectively (Table 16).

Table 16: Relationship between joining of extension package program and access to other sources of information

Type of medias	Response		
	No (%)	Yes (%)	Total
Radio ownership	40.6	59.4	100
TV ownership	7.0	93.0	100
Access to extension materials	1.6	98.4	100

Source: own survey result

Correlation analysis also employed to see the relationship between households' participation in extension package program and access to radio. Cramer's V indicated that, there is positive & significant relationship between access to radio and joining of extension package program at 5% probability level. But, no significant relationship was found for TVs and access to extension materials.

4. Conclusion and recommendation

The study addressed several issues related to female headed household participation in agricultural extension packages. The study result showed that participation of female headed households in agricultural extension package is very low which needs to be improved by stakeholders working in the area. The study also identified that inputs supply related problems, lack of capability to purchase inputs, low level of awareness

towards technology recommendations and biasness of development workers towards progressive/male farmers while input delivery processes were among the constraints to participation. On the other hand, access to oxen, radio, training, field days, credit services and extension contact are among the independent variables that favor households' participation in agricultural extension packages. Therefore, there is a need to strengthening extension contact so as to minimize the skills and knowledge gaps, improving effective input supply mechanisms, improving utilization of technology recommendations through awareness creation, diversifying households' sources of income, improving access to and utilization of credit services. It is further recommended that strengthening households' access to effective training and facilitating households to use the skills and knowledge developed from training by giving attention to other factors that favor participation.

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