

**DETERMINANTS OF AGRO-PASTORALISTS PARTICIPATION IN CATTLE  
ATTENDING PACKAGE AT FENTALE WOREDA, THE CASE OF EAST  
SHOWA ZONE, ETHIOPIA**

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**ABSTRACT**

The study tried to look into participation of agro-pastoralists in cattle fattening package at Fentale Woreda of East Showa Zone, Ethiopia with two objectives namely; assessing of agro-pastoralists participation in cattle fattening package and analyzing factors affecting agro-pastoralists participation in cattle fattening package. Probability sampling techniques were employed to select Kebeles and respondents. A total of 140 respondents were drawn randomly from the sampled Kebeles for interview based on PPS. A combination of data collection techniques like household interview schedule and PRA techniques like FGD and key informant interviews were employed to collect qualitative and quantitative data. Descriptive statistics like frequencies, mean and standard deviations was employed. Binary logistic regression mode was used to identify determinants of participation. Based on the study result, the majority of respondents (77.1%) did not participate in improved cattle fattening package whereas few respondents (22.9%) ever participated on cattle fattening activity. Binary logistic regression model showed that three variables namely; fattening experience, access to credit service and training are found to be significantly influencing agro pastoralists participation in cattle fattening package respectively at 10%, 5% and 1% probability levels. Therefore, the study recommends that appropriate cattle fattening extension package needs to be adopted at the Woreda by relevant stakeholders working in the area through paying attention to these factors.

**Key words:** Cattle, Fattening, Participation, Package

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### LIST OF ABBREVIATIONS

ATARC	Adami Tulu Agricultural Research Center
CSA	Central Statistical Agency
DA	Development Agent
EEA	Ethiopian Economics Association
EPaRDA	Ethiopian Pastoral Research and Development Association
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focused Group Discussion
MoA	Ministry of Agriculture
WoARD	Woreda of Office Agriculture and Rural Development
PPS	Probability Proportionate to Size
PRA	Participatory Rural Appraisal

## 1. INTRODUCTION

### 1.1. Background of the Study

The productivity of livestock in Ethiopia in general and beef production in particular is extremely low in terms of milk, meat production and draught power output (Azage and Alemu *et al.*, 1998), mainly because of inadequate nutrition, unimproved genetic resources and prevalence of diseases and parasites, inadequate livestock education, inadequate research and extension services. Beef production of the country is characterized as extensive low input system in conjunction with crop production, as a result of which, beef production and productivity are very low as compared to the world average (MoA, 1998).

Cattle fattening extension package is among the livestock production package adopted in Ethiopia under extension program. Cattle fattening extension component adopted in the country includes; purchased or farmers owned indigenous cattle, animal and feeding system, animal health and housing, selection of fattening animals, fattening period and marketing of fattened animals. Adoption of cattle fattening extension package of the country varies across the regions. According to EEA (2004/5), adoption of cattle fattening extension package is relatively strong for Dire Dawa administrative zone followed by Somali and Oromia regions.

At Fentale Woreda, some efforts like training and demonstration on cattle fattening extension package have been undertaken by WoARD, NGOs and research center to introduce improved cattle fattening package. Even though some efforts has been undertaking to introduce cattle fattening packages in the country in general and at the study area in particular, no/ few research findings available which identified determinants of agro-pastoralists participation in cattle fattening package. The previous research finding available is mainly focused on participation of farmers across the country. An effort to increase agro pastoralists' participation is therefore requires understanding of the existing situations which can influence participation. Therefore, this piece of study is tried to identify agro-pastoralists participation and factors affecting participation which finally helps to narrow the existing gaps.

## 1.2. Objectives

- To assess agro-pastoralists participation in cattle fattening technologies
- To assess determinants of agro-pastoralists participation in cattle fattening technologies

## 2. LITERATURE REVIEW

### 2.1. Cattle Fattening Systems in Ethiopia

#### 2.1.1. Traditional type of fattening system

Cattle are kept mainly for draft power, milk, and manure production and are usually only sold when they are too old for these purposes, or drought or cash shortages force people to sell. Oxen are usually sold after the plowing season when they are in poor condition. Meat yield are low, the beef is poor quality and farmer returns are often inadequate to buy a replacement oxen (MoA, 2002).

#### 2.1.2. Product-based type of fattening system

In 1984, Ministry of Agriculture (MoA) began to help peasant farmers in Debre Zeit area to fatten purchased cull oxen using molasses and milling by- products. This has produced profitable results for participant farmers, and the number of animals fattened has increased every year (MoA, 1996).The main source of feed is agro-by products like wheat bran and linseed cake.

#### 2.1.3. Hararghe type of fattening system

Intensive feeding of the available feed supply to young oxen they are using for draught power could best describe the Hararghe fattening practice. The feed types used for the fattening are entirely obtained from crop production especially from maize and sorghum. Pagot (1992) substantiated that in Ethiopia the farmers fatten young bullocks at the edge of the fields with lower leaves taken from the stems of sorghum. Among the most

common feed types used for fattening, thinning, leaf strip and part of maize and sorghum plants are major feeds offered to fattening animal during the main and early dry seasons.

## **2.2. Empirical Studies on the Determinants of Adoption of Improved technology and Fattening package**

### **Institutional factors**

There is growing evidence that the major factor explaining low adoption of technology in Africa is lack of appropriate institutional and policy support (Kedir, 1998). As reported by van Den Ban and Hawkins (1998), adoption of improved technologies is strongly affected by the policy environment like input supply, market, credit, price policies and improved supply system. According to Feder(1985), adoption of new technologies is associated with availability of credit. Musaba (2010) identified that level of education, participation in off-farm and non-farm activities and training are among the factors positively influencing participation of households in beef production. A study conducted by Makokha (1999) confirmed that participation of households in extension events like training has significant influence on perception and hence adoption decision of farmers.

### **Socio-economic factors**

Socio-economic factors are one of the determinant factors in livestock production innovation. A study conducted by Rachel (2010) on determinants of adoption of management practices in stocker cattle production identified that, adoption of beef production technology is influenced by farm size. Other studies conducted by Roessaliet.al., (2010)found that farmers' capacity to adopt beef production package for increasing cattle productivity depends on resources available, socio-economic characteristics, and external factors that was uncontrolled by farmers. Moreover, this author identified that number of family labor and livestock herd size are the factors positively influencing beef cattle package adoption. Other studies like Musaba (2010) identified that level of education, participation in off-farm activity and training are among the factors affecting Participation of households in beef production.

### **Demographic factors**

Age has a negative effect on adoption of farming technologies in a study by Daberkow and McBride (2003). Haji, 2003 reported positive relationship between age and adoption behavior of farmers. However, a study conducted by Bulale (2000) indicates that age had no influence on adoption of dairy production technologies in adoption of dairy production technologies. A study conducted by Rachel *et. al.*,(2010) on determinants of adoption of management practices in stocker cattle production identified that, adoption of beef production technology is influenced by household age and level of education. Other study conducted by Musaba, (2010) on determinants of beef adoption stated that, household level of education is one of the variables positively influencing of adoption.

### **Personal related factors**

One of the obstacles frequently encountered in the farming business was risk and uncertainty aspects, which should be considered in making decision to adopt improved technology. According to Meuwissen *et. al.*, (2001) price and production risk are perceived as important sources of risk, while Pasaribu and Syukur (2010) reported that the risk adversely affected the current and future farmers' decision to increase production and income. Different author like Roessali *et. al.*,(2010) identified that, perception towards risks has negative influence on adoption of beef technology.

### **Mass media exposure**

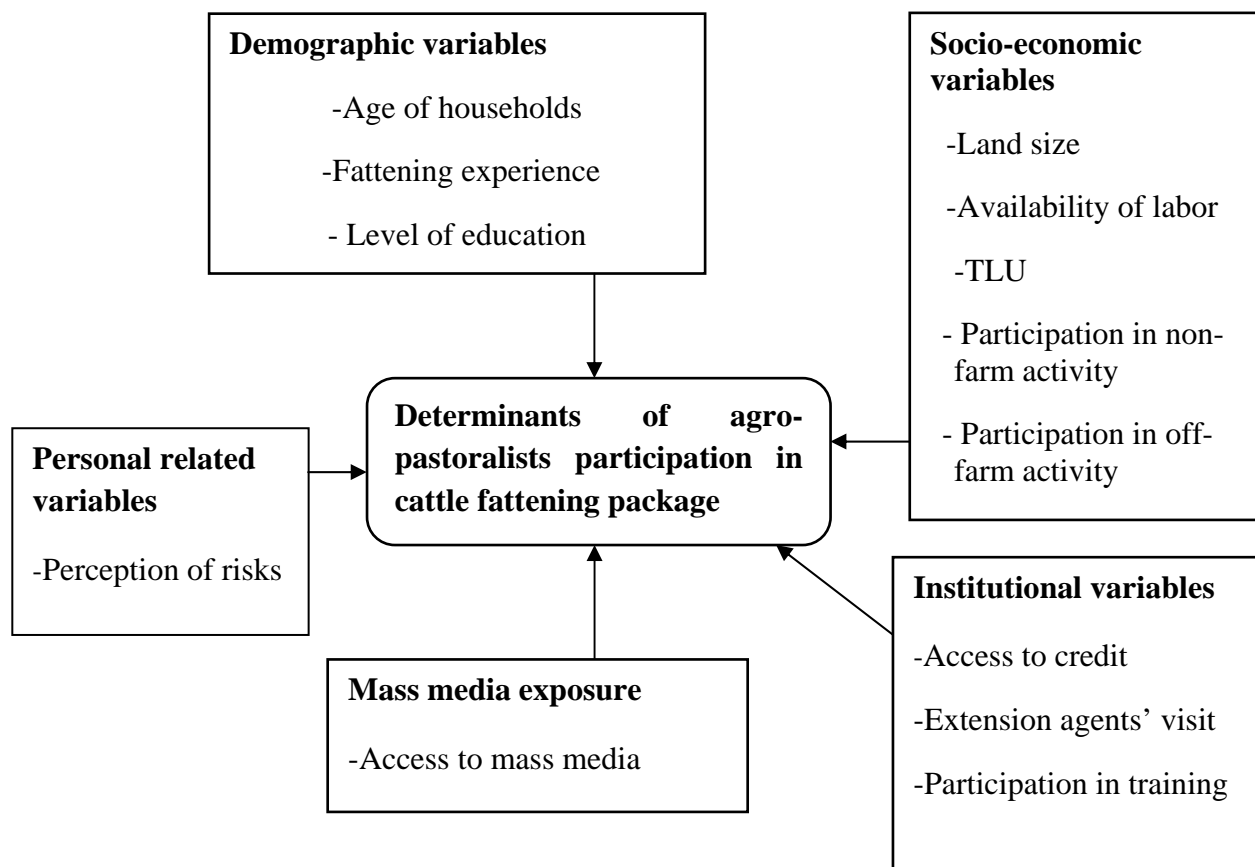
The effectiveness of extension service and other communication media is an influencing factor in the use of improved technologies (Chilot, 1996). According to Feder(1985), adoption of new technologies is associated with access to available sources of information.

### **2.3. Conceptual Framework of the Study**

The conceptual frame work was developed to analyze factors affecting of agro-pastoralists participation in cattle fattening package. Factors like socio-economic,

demographic, personal and institutional factors are hypothesized to influence agro-pastoralists participation in cattle fattening package (Figure 1).

### Conceptual framework of the study



**Figure 1: Conceptual framework of the study**

Source: Own design

### 3. METHODOLOGY

#### 3.1. Description of the Study Area

Fentale Woreda is located in the Mid of Rift Valley system in East Showa zone of Oromia Regional State, Ethiopia. The Woreda has a total of 18 Kebele. Out of the 18 Kebele, 12 Kebele are agro-pastoralists and 5 Kebele are pastoralists (WoARD, 2012). The farming system of the Woreda is categorized under agro-pastoral and pastoral farming systems. The number of agro-pastoralist Kebele is increased after irrigation dam is established at the Woreda. The Woreda has different land use systems including grazing land (11,397.43 ha), forest land (457 ha), Bush and shrub land (9,239.75ha) and farming land (19,611.25 ha) which is suitable for crop production. The major soil type of the Woreda is characterized under sandy and clay soil (WoARD, 2012). The main inhabitants of Fentale Woreda are the Kereyu and Ittu Oromos (EPaRDA, 2007).

#### 3.2. Sample Size and Method of Sampling

Probability sampling techniques were employed to select representative Kebeles and respondents. Accordingly, lottery methods were employed to draw four representative Kebeles among the 12 agro-pastoralist Kebeles of the Woreda. After selection of the Kebele, lists of household heads (sampling frame) were obtained. PPS techniques were employed to select respondents from the selected Kebele. Systematic sampling techniques were employed to select 140 respondents by a fixed interval of  $n/N$  until the required sample size was obtained. Sample size determination formula was employed to avoid under and/or over estimation of sample size by using Yemane (1967) formulas at 10% confidence interval.

$$n = N / (1 + Ne^2), \text{ where } n = \text{sample size}$$

N= agro-pastoralists of the Woreda

e: error terms (0.1)



### 3.3. Sources and Types of Data

Both primary and secondary types of data were collected. Primary data were collected mainly from respondents whereas secondary data were collected from different sources like Woreda Agriculture and Rural Development Office, books and journals. Qualitative and quantitative types of data were also collected from respondents and secondary sources.

### 3.4. Methods of Data Collection

Questionnaires were pre- tested with randomly selected households (10 agro-pastoralists) and finally, questionnaires were modified for house hold interview. A combination of data collection techniques like semi structured interview schedule and PRA tools like focus group discussion and key informant interviews were employed. FGD was undertaken at all the sampled Kebeles. Eight to twelve discussants per the four Kebeles were invited for FGD. Male and female household heads were invited for group discussion. Accordingly, a total of forty agro-pastoralists participated on focus group discussion. Two researchers were participated on discussion to collect data, describe and summarize information obtained from FGDs. Flip chart was used to record the data. Key informants like community elders, DAs and Kebele leaders were interviewed. A total of ten key informants invited for discussion across the four Kebele.

### 3.5. Methods of Data Analysis

The collected data were coded, entered and edited before running of analysis. SPSS version 16 was used for data analysis. Both qualitative and quantitative types of data were used for this study. Quantitative data were analyzed by using chi-square, Cramer's V, frequencies, t- tests, mean; standard deviation, minimum and maximum. It was described, interpreted and analyzed on the spot during data collection to avoid mis-interpretation of the information obtained. Binary logistic regression model was also employed.

### 3.6. Logit specification

There are certain types of regression models in which the dependent or response variable is dichotomous in nature, taking 1 and 0 (Yes or No answer). Binary logistic regression model (logit) allows for estimating the probability that an event occurs or not, by predicting a binary dependent outcome from a set of independent variables (Wooldridge, 2009). The binary logistic model is also advantageous because, logit analysis provides results which can be interpreted easily and the method is simple to analyze. It also gives parameter estimates which are asymptotically consistent, efficient and normal (Vasisht, 2000). The logit model is specified as under.

$$P_i = \sum (Y = 1 / \chi_i) = 1 / 1 + \exp(-(\beta_1 + \beta_2 \chi_i)) = 1 / 1 + \exp(-Z_i) \text{-----} 1$$

$$\text{Where, } Z_i = \beta_1 + \beta_2 \chi_i$$

The equation (1) is known as the (cumulative) logistic distribution function. Here  $z_1$  ranges from negative infinite to positive infinite;  $p_i$  ranges from 0 and 1;  $p_i$  is nonlinearly related to  $z_i$  (i.e.  $x_i$ ) thus satisfying the two conditions required for probability model. In satisfying this requirement, an estimation problem has been created because  $p_i$  is nonlinear not only in  $X$  but also in the  $\beta$ 's. Here  $P_i$  is the probability of agro-pastoralists to participate in cattle fattening package. It is given by;

$P_i = 1 / 1 + \exp(-Z_i)$ , then,  $(1 - P_i)$  is the probability of agro-pastoralists not to participate in cattle fattening packages. This is given by,

$$1 - P_i = 1 / 1 + \exp(Z_i), \text{ therefore, one can write, } P_i / (1 - P_i) = 1 + \exp(Z_i) / 1 + \exp(-Z_i) \text{----} \\ \text{-----} 2$$

$P_i / (1 - P_i)$ , is the odd ratio in favor of agro-pastoralists participation in cattle fattening package i.e., the probability of agro-pastoralists to participate in cattle fattening package to the probability that agro-pastoralists will not participate in cattle fattening packages. Taking natural log of the (2) we obtain,

$$L_1 = \ln(P_i / (1 - P_i)) = Z = \beta_1 + \beta_2 \chi_i \text{-----} 3$$

That is, the log of odd ratio is not only linear in X, but also linear in the parameters. L is called the Logit.

### 3.7. Estimation procedure

According to Gujarati (1995) there are various indicators of Multicollinearity and no single diagnostic will give us a complete handle over the collinearity problem. For this particular study variance inflation factor (VIF) and correlation matrix was used for continuous variables.

### 3.8. Definition of Variables and Working Hypothesis

**Dependent variable:** The dependent variable in this study is agro-pastoralists participation in cattle fattening package. It is dummy variable which takes '1' if they say yes and '0' otherwise. Participants are defined as, agro-pastoralists who used two or more package components as per the recommendations whereas those agro-pastoralists who haven't used any package were considered as non-participants.

**Independent variables:** Independent variables are those variables which are hypothesized to influence agro-pastoralists participation in cattle fattening package. These variables can be Households' demographic, institutional, personal and socio-economic variables.

## 4. RESULTS AND DISCUSSION

### 4.1. Participation of Household Heads in Cattle Fattening Extension Package

Cattle fattening extension package was introduced at the Woreda by different actors working in the area like Woreda Office of Agriculture and Rural Development, NGO and research center. At the Fentale Woreda, participation of ago-pastoralists in cattle fattening package is low. The result of frequency analysis showed that the majority of respondents (77.1 %) did not participate on the activity whereas 22.9% of respondents participated on this activity (Table 1). This finding is almost similar with the previous research findings conducted by EEA (2006) which reported that, participation of farmers on cattle fattening package in Oromiya regional State is estimated at 20 percent. In this

study, participation is defined as those agro-pastoralists who participated in cattle fattening package through adopting of at least two packages among cattle fattening extension package components. These can be feed and feeding managements, health and housing managements whereas non- participants are those agro-pastoralists who did not adopt any of cattle fattening extension packages (Table 1).

**Table 1. Participation of agro-pastoralists in cattle fattening extension package**

No.	Participation category	Sample	
		Frequency	Percentage
1	Participants	32	22.9
2	Non participants	108	77.1
	Total	140	100

Source: Own survey analysis result, 2012

## 4.2. Demographic Characteristics of Respondents

### 4.2.1. Gender

From the sampled households, the majority of respondents are male headed households (MHHLs) which constitutes 85 percent whereas female headed households (FHHLs) constitute 15 percent. Cross tabulation was employed to assess association between gender of respondents and participation in cattle fattening packages (Table 2).

**Table 2. Participation of respondents in cattle fattening package across gender**

Gender of HH.heads	Sample		
	Participants (%)	Non participants (%)	Total (%)
Male	27(84.4)	92(85.2)	119(85)
Female	5(15.6)	16(14.8)	21(15)
Total	32(100)	108(100)	140 (100)

Source: Own survey analysis result, 2012

( ) = %

#### 4.2.2. Age

The maximum age of the sampled respondents is 72 years old whereas the minimum age of respondents was 19 years old with the mean age of 33.37 and standard deviation of 9.89. The study also analyzed the relationship between age of household heads and cattle fattening package.

#### 4.2.3. Clans

At the sampled Kebeles, two main Oromo clans namely; Kereyu and Ittu are identified. From these ethnic groups, 63.6 % were Kereyu clans where as 36.4% are Ittu. As it can be observed from these figures, the majority of respondents are Kereyu. This may be due to the fact that, the majority of the inhabitants of the Woreda are Kereyu Oromo. Participation of households can be varies across the clan (Table 3).

**Table3. Participation of respondents in cattle fattening package across clans**

Clans	Sample		
	Participants	Non participant	Total
Kereyu	22(68.8)	67(62)	89( 63.6)
Ittu	10(31.2)	41(38)	51(36.4)
Total	32(100)	108(100)	140 (100)

Source: Own survey analysis result, 2012

( ) = %

#### 4.2.4. Level of education

The study identified that, the majority (71.4 %) of respondents is illiterate followed by level of schooling between 1-4(14.3 %), 5-8 (11.4%) and level of schooling between 9-12(2.9%) grade. The relationship reported between level of education and households' participation in cattle fattening package is not significant (Table 4).

**Table 4. Participation of respondents in cattle fattening package across level of education**

Level of education	Sample		
	Participants	Non participants	Total
Illiterate	22(72.2)	78(68.8)	100(71.4)
1-4	3(15.7)	17(9.3)	20(14.3)
5-8	6(9.3)	10(18.8)	16(11.4)
9-12	1(2.8)	3(3.1)	4(2.9)
Total	32(100)	108(100)	140 (100)

Source: Own survey analysis result, 2012

( ) = %,

#### 4.2.5. Labor availability

Households' labor availability can be one of the determinant factors which need to be considered in such kind of study. Availability of household members does not mean that there is no shortage of labor because; labor availability can be associated with active labor force. To do so, there are many formulas which can be used to change the available labor force to man equivalent ratio. Based on the analysis results, a mean of active labor force is 2.83 with a standard deviation of 1.35.

### 4. 3. Socio-economic Characteristics of Respondents

#### 4.3. 1. Land size

Access to land is one of the factors of production. The minimum land size owned by the sampled respondents is 0.25 ha whereas the maximum land size owned is 2.25ha. The mean of land size owned by respondents is 0.69 ha with a standard deviation of 0.33 ha.

#### 4.3. 2. Participation in off-farm and non-farm activities

According to the study result, participation of households in on-farm and non-farm activities is very low. For the sampled Kebeles, participation of households in both activities was almost similar. Frequency analysis result showed that 10 and 12. 1 percent

of respondents have participated in off-farm and non-farm activities whereas 90 and 87.9 percent of respondents were not participated on off-farm and non-farm activities respectively (Table 5).

**Table5. Participation of agro-pastoralists in off farm and non-farm activity across participants**

Activities		Sample		
		Participant	Non-participant	Total
Off-farm	Yes	5(15.6)	9(8.300)	14(10)
	No	27(84.4)	99(91.7)	126(90)
Total		32(100)	108(100)	140 (100)
Non- farm	Yes	6(22.8)	11(10.2)	17(12.1)
	No	26(81.2)	97(89.8)	123(87.9)
Total		32(100)	108(100)	140(100)

Source: Own survey results, 2012, ( ) = %,

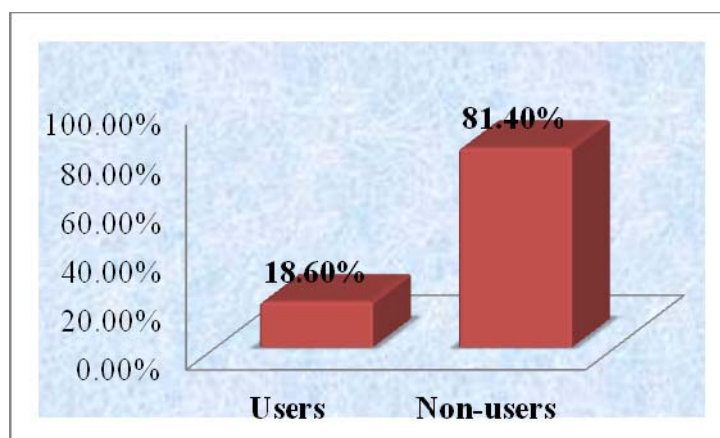
### 4.3. 3. Livestock ownership

To asses respondent livestock ownership, conversion factors were used (Appendix 4). The minimum TLU owned by respondent was 1 whereas the maximum number of TLU was 46. 61. The mean TLU of livestock owned by the sampled households was 9.67 with a standard deviation of 9.25.

## 4.4. Institutional Factors

### 4.4.1. Access to credit services

The result indicated that majority (81.4 %) of respondents have not accessed to any sort of credit service in the last five years. It has been known that only (18.6%) accessed to credit service from different credit provider (Figure 2). Access to credit services can increase agro-pastoralists participation in cattle fattening package. This is because, this type of activity require some external inputs like agro-by products.



**Figure 2: Proportion of respondents who used credit services.**

#### 4.4.2. Participation of respondents in training related to cattle fattening activity

Participation of agro-pastoralists on extension events like training can have an influence to participate in cattle fattening package. The major source of training related to cattle fattening package are; Woreda Agriculture and Rural Development Office, NGOs and research center. According to frequency analysis, participation of respondents was relatively strong for training when compared with the other two extension events. Frequency analysis result showed that 40% of respondents participated on training related to cattle fattening (Table 6).

**Table 6. Respondents access to training and participation in cattle fattening package**

Variable	Sample			
		Participants	Non-participants	Total
Training	Yes	26(81.2)	30(27.80)	56(40)
	No	6(18.8)	78(72.2)	84(60)
Total		32(100)	108(100)	140 (100)

Source: Own survey results, 2012

( ) = %



#### **4.4.3. Mass media exposure related to cattle fattening activity**

Access to mass medias like TV, radio and any of printing materials can have an influence on a given technology adoption like cattle fattening packages. On the other hand, access to media may not be always leads to participation because; participation of household heads on a given technology package can also be associated with other contributing factors. According to the analysis result, 50.7%, 7.1% and 4.3% respondents have access to radio, TVs and printed materials respectively during the last three years from the survey period. This shows that, respondent's access to information through the indicated media is weak especially, for TVs and printed media.

#### **4.4.4. Access to irrigation services**

Access to irrigation services can influence households' participation in cattle fattening package. Cattle fattening activity requires appropriate quality water at the right time and place. According to Holtzman (1987), the voluntary feed intake of ruminant livestock, particularly dry matter consumption, declines by as much as 30% if water availability is limited. Frequency analysis result shows that, the majority (84.4%) of respondents have accessed to irrigation services whereas 14.4% of respondents haven't accessed to irrigation.

#### **4.5. Perception related variables**

The variables considered here are related to respondents' perception towards risks and comparative advantage of cattle fattening technology. These variables are important factors in influencing on Households' participation in cattle fattening package. Based on frequency analysis, 22.1% of respondents perceive that participating on cattle fattening package have risks whereas 77.9% of respondents perceived that participating on cattle fattening package have no risks. In contrary to this, 75.7% of respondents believe that, participating on cattle fattening activity have comparative advantages and only 4.3% regarded as that participating on cattle fattening package have risks.

#### 4.6. Result of Econometrics Model

Binary logistic regression model was employed to identify factors affecting agro-pastoralists participation in cattle fattening package. Before running of the analysis, statistical assumptions were checked. Multicollinearity test was used to check this assumption. VIF and tolerance was used to see the independence between quantitative variables. For dummy variables, correlation matrix is used to check the independence between explanatory variables. Among the fifteen variables considered for the study, fourteen variables were used for analysis purpose and one variable is rejected from analysis because of Multicollinearity problem (Table 7).

**Table7. Estimates of binary logistic regression model**

No.	Variables	B	S.E.	Wald	Sig.	EXP(B)
1	AGE	-0.054	0.036	2.264	0.132	0.948
2	LEVELED	0.228	0.346	0.434	0.510	1.256
3	LANDSZE	0.089	0.862	0.011	0.918	1.093
4	TLU	-0.019	0.029	0.427	0.514	0.981
5	PARTNONFARM	0.358	0.730	0.241	0.623	1.431
6	PARTOFARM	0.646	0.762	0.719	0.397	1.908
7	RISKYPERCP	0.121	0.760	0.025	0.873	1.129
8	UTLZNIRWTR	1.813	1.134	2.558	0.110	6.131
9	PARTNTRNG	2.662	0.640	17.320***	0.000	14.330
10	MASMEDUTZN	0.317	0.597	0.282	0.595	1.373
11	FATEXPER	0.148	0.068	4.712**	0.030	1.159
12	LABRAVIL	0.201	0.211	0.910	0.340	1.223
13	CRDTUTIZN	1.080	0.622	3.022*	0.082	2.946
14	EXTNSNVIST	0.725	0.537	1.823	0.177	2.065
15	CONSTANT	-4.879	1.826	7.144	0.008	0.008

\*= significant at p-value < 0.1 -2 Log likelihood= 99.350

\*\*= significant at p-value < 0.05 Nagelkerke  $R^2$  = 0.465

\*\*\*= significant at p-value < 0.01 Model Chi-square = 51.163\*\*\*, df= 14

Fourteen variables were entered for analysis. Among these, four variables namely; cattle fattening experience, access to credit services, participation in training related to cattle fattening activity and cattle fattening experiences have found to be significantly affect household's participation in cattle fattening packages.

**FATEXPER:** Household heads cattle fattening experience is found to be significantly influence household heads participation in cattle fattening package at  $p\text{-value} < 0.05$  indicating that for a unit increase in cattle fattening experience, the logs of odds ratio in favor of participation in cattle fattening package will be increased by 1.16. This is due to the fact that, a household heads with fattening experience can accumulate knowledge and skill related to fattening activities. He/she also knows the comparative advantage of engaging in this activity. Hence, these household heads tend to have more willing than those who don't have fattening experience.

**CRDTUTIZN.** Utilization of credit services is also found to be significantly influence households' participation in cattle fattening package at  $p\text{-value} < 0.05$ . On the other hand, the result of odds-ratio indicates that if agro-pastoralists accessed to training, the logs of odds ratio in favor of households' participation in cattle fattening package will be increased by 2.95. This is due to the fact that, cattle fattening activity may require external inputs like agro-by products. On the other hand, agro-pastoralists may face financial constraints to purchase this inputs hence; utilization of credit can help users to purchase these inputs. Earlier studies also confirmed that credit is one of factors that can influence on application of new technologies (Yishak, 2005).

**TRNGPARTN:** According to the analysis result, participation of household heads on training has significant influence on household heads participation in cattle fattening package at  $p\text{-value} < 0.01$ . Furthermore, the odd-ratio result shows that, if agro-pastoralists accessed to training, the logs of odds ratio in favor of participation on cattle fattening package increase by 14.330. This is due to the fact that, cattle fattening package is a skill demanding activity in terms of feed managements like ration formulation, physical and chemical treatment. Moreover, animal health and housing management is also a skill demanding activity. Also the study conducted by Edlu (2006) confirmed that

Participation in training will enable farmers to get more information and improve their understanding about the available package, which may intern lead to a change in their knowledge, attitude and behavior.

## 5. CONCLUSION AND RECOMMENDATIONS

From the study it has been identified that participation of households in cattle fattening package is very low which is mainly related to institutional factors. Binary logistic regression model identified that the three variables namely; access to training, credit services and cattle fattening experience are among the explanatory variables influencing participation of households in improved cattle fattening activities. Therefore, Participation of agro-pastoralists in improved cattle fattening package needs to be improved in the Woreda through adopting of appropriate cattle fattening package. The available cattle fattening technology needs to be adopted by considering of sustainability issue through paying attention to factors influencing participation like effective credit services and training.

## 6. REFERENCES

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