Determinants of Level of Women Participation in Urban Agriculture: The Case of Wolaita Sodo Town, Southern Region of Ethiopia

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Abstract

This study investigates determinants of the level of women participation in urban agriculture in Wolaita Sodo town. The study sampled 204 women respondents who have selected based on multi-stage sampling technique. The researcher employed with structured questionnaire in order to collect data from the participants. The study use econometrics and descriptive method of analysis. Tobit model is used to examine the determinants of level of women participation in urban agriculture, and also used descriptive method of analysis in order to measure and identify the extent of women participation in urban agriculture. The Tobit model result shows that age is negatively and significantly affect their participation, on the other hand the factors such as dependency ratio, having credit, extension worker contact, land ownership, neighbor influence, farm experience, and access to improve seed are positively and significantly affect the level of women participation in urban agriculture. From the descriptive method of analysis result 22% of women in the study area participate in urban agriculture and their extent of participation is on average 34.3% which is approximately constitutes; only 26.9% in crop production, only 25% in livestock, and 51.1% in both(crop and livestock) activities. Participant women averagely get an income of 557 birr/month from crop production, 3250 birr/month from livestock rearing, and 3392 birr/month from both(crop and livestock). This imply that based on the finding that government and non-government organization should pay due attention to create ample platform to allow women to participate in urban agriculture, wider community sensitization and awareness creation on the importance of urban agriculture for livelihood and economic security should be undergone and finally, policy makers have to give attention for agricultural activities not only in rural but also in urban area with gender sensitive approach.

Keywords: Participation, Tobit model, Urban agriculture, Women

1. Introduction

Women constitute half of world's population and they play vital roles in agricultural production in all parts of the world (Oladejo *et al,* 2011). According to FAO, women participation in agricultural activates could increase productivity by up to 30% if they had the same access as men to productive resources (RUAF, 2015). It is estimated that, they produce 40% of the gross domestic product (GDP) and 50% of developing nations' food (Nuhu *et al,* 2014).

Women plays critical roles to attend in every pillars of food security; availability, access and utilization. Their role is thus crucial throughout the agricultural value chain from production on the family plot to food preparation, and distribution within the household. However, their roles are generally undervalued and constrained by so many socio-economic factors and opportunities (ADB, 2013).

It is estimated that about 800 million people worldwide will engage in urban agriculture the next twenty years. In Russia, 72% of households are urban farmers, 68% in Tanzania, while in China the 14 largest cities produce 85% or more of vegetables. It is thought that globally, urban agriculture produces 15% of all food consumed in urban areas, and that this figure is likely to double within (Mpofu, 2013).

Urban agriculture has become one of the fastest emerging trends, especially in the developing world where urban agriculture grows at 3.5% annually (Gamhewage *et al,* 2015). It is estimated that as many as 40% of the urban population in Africa is involved in urban agriculture (Foeken *et al*, 2004). According to CSA, (2014) 30% of urban residences in Ethiopia participate in urban agriculture activities and out of this 13% are women. Over the past decade, the recognition of the fact that a large part of the urban farmers consists of women have increased (RUAF, 2015).

General focus on agriculture has been on male farmer; neglecting the experiences of women especially in urban agriculture. However, recent literature shows predominance of women engagement in urban agriculture in many regions especially in Africa (Wilbers, 2004). Traditionally in most parts of Africa particularly in Ethiopia, women are responsible for household food provision and farming because it is relatively easy to combine with the child care (Foeken *et al,* 2004).

Thus, urban agriculture is estimated to meet a substantial portion of the city's demand for eggs, poultry, dairy products and green vegetables. Gebremichael *et al.,*(2014) stated that two-thirds of household income is derived from farming for those residents of Addis Ababa engaged in urban farming.

Urban agriculture is more potential sector in Ethiopia, according to a Central Statistical Authority

(CSA) report (2007), 30% of vegetables including 60–70% of leafy vegetables, 60–70% of milk and 40–60% of eggs consumed in the city are supplied by urban and peri-urban. Approximately 62 tons of honey is produced in Addis Ababa each year with an average of 40 kg of honey obtained annually per improved beehive. This output is approximately double that of rural parts of the country where only 15–20 kg per beehive per year is harvested (Gebremichael., *et al,* 2014).

Generally participating women in urban agriculture means decreasing food insecurity, urban poverty, unemployment rate, protecting environment by keeping greenness and recycling dry and liquid wastes, and ensuring the food security of the community in short it will overcome vigorous socio-economic and environmental problems that could contribute to meet Millennium Development Goals (ADB, 2013).

Hence, this study needs to investigate the major factor that determines the level of women participation in urban agriculture.

1.3. Objective of the study
1.3.1 General objective
The general objective of the study is to examine the factors that determine the level of women participation in urban agriculture in case of Wolaita Sodo town.
1.3.2. Specific objective
Specific objectives of this study are:
- To identify the socio-economic characteristics of participant and non participant women in urban agriculture in the study area.
- To analyze the major determinants in the level of women participation in urban agriculture.
- To measure and identify the extent of women participation in urban agricultural activities.

2. Research methodology
2.1. The sampling technique and sampling size determination
This study is used three- stage sampling technique. In the first stage wolaita soddo town is purposively selected from three administrative towns of wolaita zone. In the second stage out of the total number of elven kebele four kebeles are randomly selected, this is because as the town addiminadtration agriculture office 2015 report reveled, even if the level of participation in urban agriculture differs, in all kebele there is practice of urban agriculture. Then in the third stage by using the year of 2015 women development group lists from each kebele systematically the ith women is selected for this study observation purpose. Unfortunately if the ith women is not around, the researcher was used the immediate next women for observation.

According to Yemane, (1967) as cited in Glenn and Israel, (2013) to yield a representative sample for proportion when target population is >20,000, with 7% precision 204 sample size is representative.

Table 1: Proportional Sample size determination:-

No	Name of selected kebeles	No of women	No of women Sample size
1	Kidane mhiret	1188	50
2	Gido	966	41
3	Gola	1228	52
4	Qera	1440	61
	Total	4822	204

2.2. Method of data analysis
Descriptive statistics and econometrics model is use to attain the objectives. The first and the second objectives are analyzed by using descriptive statistics method and for the third objective econometric model (Tobit model) is employed.
2.2.1. Econometric model Specification
According to this study Tobit model basically is used to investigate the major factors that affect the level of women participation in urban agriculture. Hence, According to Wooldridge, (2009), Tobit model is quite convenient for analysis when a dependent variable Y_i which cannot take negative values and the explanatory variable which has sensible partial effects over a wide range and also it is also better to estimate features of distribution of Y given $X_1, X_2,......, X_K$ other than the conditional expectation. Probit or logit models would be adequate techniques for addressing probability questions. But in this study it is important to know the extent or level of their participation and the factors that influence the level of their participation. In this study the dependent variable Y_i is the level of women participation in urban agriculture. Hence, Tobit model is appropriate since the dependent variable is measuring the level of participation in urban agricultural activities (Ike, 2015)

Therefore, the Tobit model assumes that there is an underling stochastic index equal to $(X_i\beta + \varepsilon_i)$ which is observed only when it is positive and qualifies as an observed latent variable *(Y*)*. Y_i is the level of

women participation in urban agriculture activities as the observed dependent (censored) variable it will fall in to the range.

As Aisha and et al (2013), measured level of participation in agricultural activity, this study is also measure level of women participation in urban agriculture (Y_i) is the proportion of the involvements in various urban agricultural activities.

$$WPL_i = \frac{the\ sum\ of\ Weighted\ amount\ activities\ a\ women\ involvmen\ in\ each\ UA\ activity}{Total\ No\ of\ major\ UA\ activities}$$

$WPL_i=0$, If a women is not participate in any kind of urban agricultural related activities or

$WPL_i>0$, If a women participate or take a part of urban agricultural activity.

Tobit econometric model following from the work of Adiqa, (2009) and Ike, (2015), can be expressed as:

$$Y_i = \max(Y^*, 0)$$

$$Y_i^* = \beta X_i + \varepsilon_i$$

$$Y_i = \begin{cases} Y_i^* \ if \ Y^* > 0 \\ 0 \ if \ Y^* \leq 0 \end{cases}$$

Where Y_i^* is a latent variable (unobserved for values smaller or equal to 0) representing extent of women participation in urban agriculture activity, X_i is a vector of independent variables, which includes the factors affecting women participation in urban agriculture activities, β is a vector of unknown parameters and ε is a stochastic error term assumed independently and normally distributed with zero mean and constant variance and i= 1, 2, 3,…., n is the number of observations.

It should be noted that observed 0's on the dependent variable could mean either a"true" 0 or censored data. At least some of the observations must be censored data, or Y_i would always equal Y_i^* and the true model would be linear regression, not Tobit. Maximum- likelihood estimation of the Tobit model is straightforward. Let f (.) and F (.) denote the density function and the n cumulative density function for Y_i^*. Then the model implies that the probabilities of observing a non- zero Y are f (Y) and p(Y^* < 0) = F (0), respectively. The log – likelihood function for the model is therefore

$$lnL = \left(\prod_{y_{i>0}} f(y_i) \prod_{y_i} F(0) \right)$$

$$= \sum_{y_{i>0}} \ln f(y_i) + \sum_{y_{i=0}} lnF(0)$$

because Y^* is normally distributed (as the ε's are normally distributed), f (.) and F (.), and, therefore, the log –likelihood function, can be re-expressed in terms of the density function and the cumulative density function of the standard normal distribution, $\emptyset$ (.) and Φ (.), and the log-likelihood function can be written in the familiar form:-

$$\ln L = \sum_{y_{i>0}} \left(-ln\ \sigma + ln\emptyset(y_i - x_i\beta) \right) + \sum_{y_{i=0}} ln \left(1 - \Phi \left(\frac{x_i\ \beta}{\sigma} \right) \right)$$

Maximum likelihood estimation can then proceed in the usual fashion. Unlike traditional coefficient, the Tobit coefficients cannot be interpreted directly as estimated of marginal effects of changes in the explanatory variables on the expected value of the dependent variable. Each marginal effect in Tobit equation includes both the influence of explanatory variable and the probability of participation as well as extent of participation. To decompose the relevant effects of changes in explanatory variables on dependent variable the expected value of Y in the tobit model is:

$$\mathcal{E}(Y) = F(Z)\mathcal{E}(Y^*) = X\beta F(Z) + \sigma f(z)$$

$\mathcal{E}(Y)$ Indexes are the expected value of the level of women participation in urban agriculture activities.

$\mathcal{E}(Y^*)$ Gives the expected value of women participation by those who are already involved in urban agriculture activities

Z   Gives as $\frac{(\alpha + \sum_{i=1}^{n} X_i\beta_i)}{\sigma}$ is the z-score for an area under the normal curve, evaluated as the mean values of X_i

α   Is the constant term in tobit estimate

β_i Are the coefficients of the independent variable

f(z)   Is the standard normal density distribution function

$F(Z)$ Is the cumulative standard normal distribution function. It predicts the probability of women

participation in urban agriculture activity, given the mean value of the explanatory variable. That's the percentage chance of participation by new participates in urban agriculture activities.

The derivative of $\mathcal{E}(Y)$ with respect to X_i yields

$$\frac{\delta\mathcal{E}(Y)}{\delta X_i} = F(Z)\frac{\delta\mathcal{E}(Y^*)}{\delta X_i} + \mathcal{E}(Y^*)\frac{\delta F(Z)}{\delta X_i}$$

The following model is estimated in this study

$$Y_i = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_{12} X_{12} + \varepsilon_i$$

$$Y_i = \beta_o + \beta_1 AGE + \beta_2 MARGE + \beta_3 FAMSIZ + \beta_4 DEPRAT + \beta_5 LVLEDU + \beta_6 NAINC + \beta_7 HAVCRE + \beta_8 EXTWCO + \beta_9 LANOW + \beta_{10} NEINF + \beta_{11} FAEXP + \beta_{12} ACIMS + \varepsilon_i$$

Table 2: Explanatory Variable Specification, Definition, Measurement and Expected Sign

Variable specification	Definition of Variable	Measurement(unit)	Expected Sign
Age(AGE)	Age of a women or respondent	Continuous variable measured in year	+/ -
Marital status (MARSTA)	Marital status of a women	Dummy variable measured as(1 if a women married and 0 otherwise)	+
Family size (FAMSZ)	Total number of people in the family	Continuous variable measured in number	+
Dependency ratio (DR)	Rate of dependency in the family	Continuous variable and measured in %	+
Level of Education (LVLEDUC)	Women's educational level education	Continuous variable measured in years	+/-
Non -UA Income (NUAINC)	Non- UA income of a women	Continuous variable measured in birr	-
Having credit (HACR)	Women who have credit	Dummy variable measured as (1 if a women own credit, 0 otherwise)	+
Extension worker contact (EXWCON)	Extension worker contact to a women	Dummy variable measured as(1 if a women have contact and 0 otherwise)	+
land ownership (LANOW)	Land ownership of a women	Dummy variable measured as (1if a women own land and 0 otherwise)	+
Neighbor influence (NEGINF)	A Women influenced by neighbors	Dummy variable measured as(1 if a women influenced by neighbor and 0 otherwise)	+
Farm experience (FAREXP)	Farm experience of a women	Continuous variable measured in years of experience	+
Access to improve seed (ACIMS)	An access of improved seed input for women	Dummy variable measured as (1 if a women have an access and 0 otherwise)	+

3. Results and discussions
3.1. Descriptive analysis of the survey data
3.1.1. Basic socio-economic and demographic characteristics of sample respondents
The total sampled respondents are 204 individual women, 46(22%) of women are participated in urban agricultural activities, which is higher than that of country level. Out of those who participated in urban agriculture 18(39%) of the participants are engaged in urban agriculture only for home consumption purpose and the rest of them 28(61%) participated for consumption and income generating purpose.

Average age of the sample respondents is 39 year. Therefore women in the study area can be described as young and belong to economically active age group of the country's population. The average age of participant and non-participant women is 43 and 38 respectively.

The sampled women have family sizes of minimum 1 and maximum 12 members with average family size of 5.7. The surveyed result showed that 100(49%) of women have 6-10 family size. The average family size of participant and non-participant is 5.24 and 4.7 respectively. The t-test from table 3 shows that there is significant mean difference between the two participants. This may be because, with the increase in the family members, their proportional income obtained from non-urban agricultural activities among family members will decrease with the increase in family member. This intern a women prefers to participate in urban agricultural

activities which has better income source.

Dependency ratio also one of the factors and as the t-test result with mean difference indicates that's that it is significantly affect women participation in agricultural activities. This pointed out that those women averagely with high dependency ratio are participated in urban agriculture activity. This may be a sign of as dependent family members' increase the proportion of their income among family members will become low, thus in order to subsidize their income and food expenditure women needed to participate in urban agricultural activities.

Table 3: Mean Socio- economic characteristics of participant and non-participant women

Variables	Total(N=204)				Participant (N=46)	Non-Participant (N=158)	Mean diff	t-test
	Mean	Std.dev	Min	Max	Mean	Mean		
Age(yrs)	39.09	14.01	18	89	43	38	5	2.46***
Family Size(number)	5.74	2.84	1	12	7	5	2	5.06***
Education (yrs)	7.9	4.29	0	17	8	7	1	1.24
Dependency ratio	0.5	0.56	0	2	1.05	0.34	0.71	8.4***
Non-UA income(birr)	730	878	0	5600	725	747	-22	-0.14
Farm experience (yrs)	3.69	6.49	0	20	12.41	1.15	11.26	10.75***

Source: Survey data, 2016

From table 3 the surveyed result reveled that woman in the study area has an average 3.69 year farm experience. Women who are participating in urban agricultural activity have an average of 12.4 years of farm experience. This implies those women who have better farm experience are participating in agricultural activities. Participant women in the study area have an average 10, 15 and 14 years of farm experience are participating crop, livestock and both activities respectively.

As the study result shown in bellow pi-chart average monthly income of women who is participating in urban agriculture activity is 507.13 birr/month. This income is obtained from crop production and livestock raring activities. As the result also indicated that average income of women who is participating in crop, livestock and both activities are 557, 3250 and 3392 birr/month respectively. Women who are participating in both activities have greater income than that of crop and livestock participant.

Figure 1: Income proportion relating with urban agricultural activities
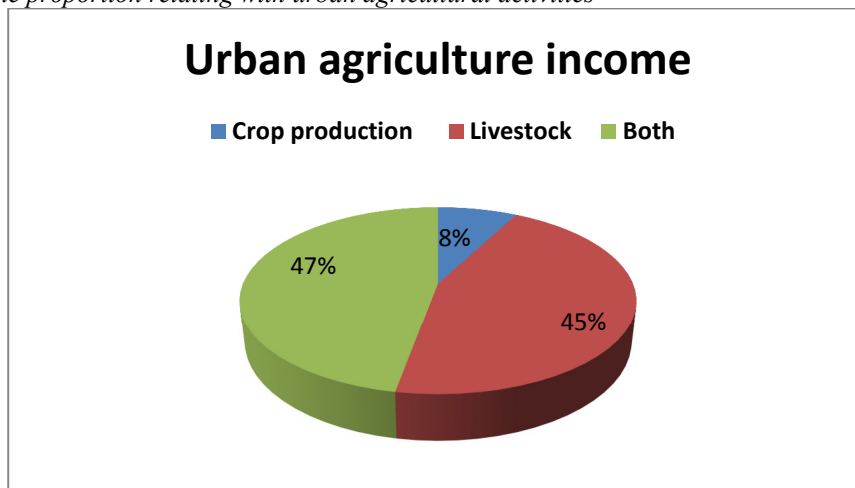
Source: Survey data, 2016

In addition to that women who are participating in both activities (crop and livestock) have 47% of income. 45% and 8% of urban agricultural income is source only from livestock and only from crop production respectively. This indicated that as women participate in different urban agricultural activities have its own income advantage, this may be because of the farm input cost will decrease; this means one production west use as an input for the other and the vice versa also true.

From table 4 chi-square values shows that all categorical variables considered in women participation in urban agriculture indicates that there is significant differences in both categories. Marital status of women in the study area is one of the factors of women participation in urban agriculture. Out of sample survey 153(75%) of women are married the rest of them 51(25%) are single, widowed and divorced. Among 46(158) surveyed women of participant and non participant 85% (70%) of are married respectively.

The surveyed result indicated that out of 204 sampled women only 44 women have an extension

contact. Majority of women (78%) do not have extension contact. In the town 76% of participant women have contact with extension workers.

Land ownership is one of the factors that affect level of women participation in urban agriculture. As the survey result shows that only 30% of women have land. Out of land owners 62% of them are participating in urban agricultural activities.

A survey result collected indicated that 24(12%) of participant women are starting their agricultural activities positively influenced by their neighbors.

Only 41 women and 20% proportion of the survey data women have an access of improved seed. From out of this proportion 72% of them are participant and 5% of them are from non participant. This may be the rest of them have no information if there is an access or not.

Out of the surveyed data 55% of women have saving account and save an average of 130.80birr/month. An average of 392 birr/month is saved by non-participant. This implies that participant women save more than that of non- participant.

The result indicates that 24% proportion of women are having formal or informal credit within two years of interval out of who are having credit 52% of women are participating in urban agricultural activities and 48% of them are non participant. This implies that having credit is more crucial for participant in urban agriculture activities.

Table 4: Proportion of socio-economic and institutional characteristics of UA participant and non-participant

Variables	Response	Total (N=204) Freq (%)	Participant (N=46) Freq (%)	Non-participant (N=158) Freq (%)	Chi-square (X^2)	p-value
Marital status	Married Single Widowed Divorced	153(75%) 28(14%) 9(4%) 14(7%)	39(85%) 1(2%) 2(4%) 4(9%)	114(72%) 27(17%) 7(5%) 10(6%)	19.67	0.000***
Extension contact	No Yes	160(78%) 44(22%)	11(24%) 35(76%)	149(94%) 9(6%)	107.89	0.000***
land ownership	No Yes	143(70%) 61(30%)	8(17%) 38(83%)	135(85%) 23(15%)	81.94	0.000***
Neighbor influence	No Yes	180(88%) 24(12%)	22(48%) 24(54%)	158(100%) -	96.10	0.000***
Access to improved seed	No Yes	160(80%) 41(20%)	13(28%) 33(72%)	150(95%) 8(5%)	101.89	0.000***
Having saving Account	No Yes	156(76%) 112(55%)	15(33%) 31(67%)	77(49%) 135(85%)	4.56	0.033**
Having credit	No Yes	156(76%) 48(24%)	21(46%) 25(54%)	135(85%) 23(15%)	32.9	0.000***

Source: survey result, 2016

3.1.2. Extent of women participation in urban agriculture

For convenience the researcher intentionally needs to segregate urban agriculture activities in to three groups such as crop, livestock and participant in both urban agricultural related activities. To measure the extent of women participation in urban agricultural activities; the researcher take the participant sample (46) in to consideration.

The extent of women participation in urban agricultural activity is measured by using four point continuums namely "never"=0, "rarely"=0.25, "occasionally"=0.5 and "always"=1 with respect to total number of 25 crop production and live stock related activities. So the weighted sum of all activities done by women is divided by the total number of urban agricultural activities used as to measure of extent of their participation. Therefore, in order to measure the extent or level of women participation in urban agriculture ($Y^* = PI$)

$$Y^* = PI = \frac{\sum_{K=1}^{K} WPUA_{iK}}{\sum_{k=1}^{k} TUA_K}$$

$Y^* = PI =$ Extent of women participation (participation index)

$\sum_{K=1}^{K} WPUA_{iK} =$ indicate the sum of the value of i women participate in k type related of urban agricultural activity

$\sum_{k=1}^{k} TUA_K =$ indicate the total sum of the k type urban agricultural activity women participate in the study area.

Table 5: Extent of women participation in UA related activities in the study area

Name of kebele	Extent of participation in UA			Total extent of participation N(*)
	Crop production N(*)	Livestock raring N(*)	both activities N(*)	
Kidane mihiret	5(0.242)	2(0.26)	9(0.468)	16(0.323)
Gido	3(0.25)	2(0.325)	3(0.503)	8(0.359)
Gola	4(0.3)	-	4(0.512)	8(0.270)
Qera	6(0.285)	3(0.416)	5(0.562)	14(0.421)
Total	17(0.269)	7(0.250)	21(0.511)	46(0.343)

Note: N=number of women involved in the activity, (*) = indicate average extent of participation in urban agricultural related activities: Source: Survey result, 2016.

3.2. Econometrics result
3.2.1 Tobit regression result

The stata 11 software was used to estimate the parameters and marginal effects of the determinants of the level of women participation in urban agriculture. Based on the result on the table the Log pseudo likelihood is -4.2800 and 204 observations in the data set were used in the analysis. The model is with 95% Pseudo R^2 with p-value 0.000, meaning that the overall model is significant and thus fit well the data.

As the regression result shows that, the level of women participation in urban agriculture is significantly determined by age of women, dependency ratio, having credit, extension worker contact, neighbor influence, land ownership, farm experience and access of improved seed.

Based on these result on table 6, women's age indicated a negative and significant relationship with $p < 0.05$. This implies that a unit increase in women's age will lead to decrease in level of women participation in agricultural activities by 0. 5%. This can be explained by the fact that elder women significantly lower their level of participation. This result is the reverses of Gamhewage *et al,* 2015, in their finding the variable age distribution survey of the respondents have positive and significant effect on their participation.

Dependency ratio is one of the factors that highly positively affect the level of women participation in urban agricultural activities. Thus, as the dependency ratio increase the level of women participation in urban agriculture is increased by 16.7%. This is in order to subsidize income proportion within the family members or to compensate the increasing level of food consumption expenditure.

Women who have credit is positively and significantly related with level of participation in urban agricultural activity with $p < 0.10$. Women in the study area who are having credit more likely increase level of women participation in urban agricultural activities by marginal effect of 8.8% than those who do not have credit. This implies that accessing credit for women has crucial impact on to increase their participation in agricultural production in the study area. Adedayo and Tude, (2013) also found in their descriptive study they found credit is the most and number one pressing problem among women in urban agricultural activity.

The result also indicated that a positive and significant relationship at ($p < 0.05$) between women participation and neighbor influence. This impaling those women who have participant neighbor in urban agriculture activity more likely participate in urban agricultural activity. The chance of participation will be greater by 11% with compared to who have no participant neighbor.

Land ownership have positive and significant relationship ($p < 0.01$) with women participation in urban agricultural activities. This implies that women those who owned land most probably participate in urban agricultural activities than those who have no land, the probability of participation increase by 19.7%. This result in similar with Adedayo and Tunde, (2013), identified land ownership is the most critical problem women farmer face in the town, 61% of the respondent ranked number one challenge to engage in urban agriculture. This indicated that

The factor extension worker contacts have positive and significant effect at ($p < 0.05$) on women participation in urban agriculture activity. Women who have an extension worker contact are most probably increasing the level of women participation in urban agriculture by marginal effect of 1.7%, than those who have no contact with extension workers.

As the result indicated on table 6 farm experiences in year is significantly affect level of women participation in urban agricultural activities. For each additional unit increase in women farming experience, the level of participation increased by 1.7%.

Result from table 6 indicated that women with access to improved seed are more likely participate in urban agriculture with compared to who have no access in urban agricultural activities. This means the variable is positively and significantly affects the increase in the probability of women participation in urban agriculture by marginal effect of 11.8 %.

Table 6: The marginal effect of the explanatory variable on the level of women participation in urban agriculture

Variable	Marginal effect	Std. Err.	Z	P>|z|	[95% Conf. Interval]	
AGE	-.0059635	.0028426	-2.10	0.036**	-.0115348	-.0003921
MARSTA	.0126622	.0755305	0.17	0.867	-.1353748	.1606993
FAMSIZ	.009391	.0109339	0.86	0.390	-.012039	.030821
DEPRAT	.1677649	.041918	4.00	0.000***	.0856071	.2499227
LVLEDU	.0025319	.0069678	0.36	0.716	-.0111248	.0161885
NOAINC	-6.43e-06	.0000352	-0.18	0.855	-.0000753	.0000625
HACRE*	.0885191	.0471665	1.88	0.061*	-.0039255	.1809637
EXWCO*	.1281383	.0629414	2.04	0.042**	.0047755	.2515011
LNOW*	.1976778	.0623389	3.17	0.002***	.0754959	.3198598
NEINF*	.1117855	.0511733	2.18	0.029**	.0114877	.2120832
FAEXP	.0174684	.0039703	4.40	0.000***	.0096868	.02525
ACIMS*	.1184599	.0528919	2.24	0.025**	.0147937	.222126

*significance at 10%, ** significance at 5%, ***significance at 1%, variables name with * sign indicates dummy variables.*

4. Conclusion and policy implication
4.1. Summary and Conclusion
This study analyzed the determining factor that affect the level of women participation and the extent of women participation in urban agricultural activities and. The study sampled 204 individual women who were selected from Wolaita Soddo town by using multi- stage sampling method.

The analysis shows that in the study area 22% of women participated in urban agricultural activities. This indicates even if women in the study area have better participation in urban agricultural activities with compared to national level which is 13% (CSA, 2014), it indicates low participation in urban agricultural activities. In terms of location, women in Kidane mihiret kebele contributed more participant which covers 34.78% of participants out of the four sampled kebeles and followed by 30.43% Qera, 17.39% of participant have equal proportion is shared by Gido and Qera kebeles. It is also seen that among participant women 45.6% of women is participated in both (crop production and livestock raring) activities, 37% of women is only in crop production and 15% of women are participated only in livestock raring activities. This implies that women participation in urban agricultural activity is varied kebele to kebele and type to type of agricultural activities.

The extent of women participation in urban agricultural activity in the study area is an average of 34.3%. The extent of participation proportion is approximately 26.9% only in crop production, 25% only in livestock rearing and 51.1% in both urban agricultural activities respectively.

Tobit econometric model was used to analyze whether the factors have an effect on the indexed dependent variable or not. Non- urban agricultural income are expected to reduce the level of women participation in urban agricultural activities where as marital status, dependency ratio, family size, having credit, extension worker contact, neighbor influence, land ownership, farm experience, access to improved seed are expected to increase the level of women participation in urban agricultural activities. Level of education and age of women is expected may or may not increase or decrease the indexed dependent variable.

Finally the marginal effect result has shown that age, dependency ratio, having credit, neighbor influence, land ownership, extension worker contact, farm experience and access to improved seed are important variables that increase the level of women participation in urban agricultural activities.

4.2. Policy Implication
Following the result from the descriptive and econometric analysis the following policy implication are followed as alternatives to have better women participation in urban agricultural activities.

The policy implication is that specially women who are in active age group better to give training and awareness in modern way of cultivation urban agricultural practice. Governmental and non governmental institutions should have to mainstreaming gender issues in their plan and follow the implementation and also the progress in order to increase women participation.

It is better to strengthen women development groups to share good economic and developmental ideas and practices especially concerning to increase urban agricultural activities between each other or neighbors.

Even if government has agricultural policy and strategy in town, it needs more attention specially capacitating extension workers with quality and quantity by providing better training and experience sharing

with gender sensitive manner.

Urban planners need to take urban agricultural activities in to consideration with availability of accesses. In addition to this governmental and non governmental institutions should promote urban agricultural activities which can be performed using piece of land and with minimum capital. Moreover, it is recommendable if they provide and promote improved technologies and input accesses.

Generally, this study reveal women's level of participation in urban agricultural activities and factors that affect their level of participation in the study area, furthermore this research is done at local level and it is better to expand in another way with additional problem like study on the economic and social advantage, perception of participating in urban agricultural activities. This study is done by using Tobit model by setting level of participation measurement so, the researcher forward to use another methodology and measurement method.

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