CONTRIBUTION AND DETERMINANTS OF URBAN AGRICULTURE TO EMPLOYMENT CREATION IN BISHOFTU TOWN, OROMIA REGION, ETHIOPIA

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ABSTRACT

This paper attempted to look at the contribution and determinants of urban agriculture to employment creation in Ethiopia, taking Bishoftu town, as a case. To meet this objective, both secondary and primary data were collected. A sample of 42 Micro and Small Enterprises level Farms (MSEFs) and 93 household level farms (HLFs) addressed using well-structured questionnaire. To analyze the data, both descriptive and inferential techniques were applied. Moreover, Regression Model was applied for estimation purpose. The result further indicated that the sector has played instrumental roles to employment creation in various levels. Though the result indicates that both forms of urban farms contributes to employment generation, those organized by SMEFs has created more jobs (average of 5.6) than that of HLFs (average jobs created were 1.76). Moreover, The result of MLR model estimation for employment contribution by household farm indicated that, the average number of fulltime workers used by the farm was significantly influenced by those farmer respondents having the perception of a better credit and inputs access, land access and ownership, holding diploma and above educational level, better farm income and engagement in poultry and dairy farms. Therefore, it is recommended that specific policy and guidelines should be designed that ensures farmers' access land and land ownership, market, technical assistance and inputs.

Keywords: Urban Agriculture; Employment Creation; Micro and Small Enterprise level farming, household level farming operators Urbanization

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1. INTRODUCTION

1.1. Background of the Study

Unlike other parts of the world, Africa's increasing urbanization has not been matched by infrastructural and economic development. Difficult economic conditions have shrunk job opportunities especially in urban areas. Consequently, many people migrants to urban Africa face the reality of unemployment, inadequate accommodation, lack of pure drinking water etc (Dima et al., 2002; Mougeot, 2005;Gündel, 2006; Jatta, 2013). Thus, as urbanisation takes place another important trend is revealed, namely the locus of poverty, insecurity and malnutrition in sub-Sahara Africa including Ethiopia, and is slowly shifting from rural to urban area (IFPRI, 2000; Cofieet al., 2005; Mpofu, 2013). Although much attention has been given by governments and donors to urban job creation and employment sources, health and infrastructure, International Food Policy Research Institution's (IFPRI's) on Global Vision 2020emphasizes that efforts to improve urban livelihoods must go beyond a focus on urban jobs (Gündel, 2006). This is because poverty in urban areas is affected by a particular combination of factors which tend to produce a wide range of vulnerabilities. The most vulnerable involves urban poor dwellers who are more immersed in the cash economy but earn incomes that are often unpredictable, unreliable and small (smith, 1998 cited in Kutiwaet al., 2010; Awasthi, 2013).

The rapid increase in urban population that results from rural-urban migration in search of employment among other reasons significantly increases the numbers of poor people in the cities (Awasthi, 2013). In response to these, farming in the cities seems to be gaining recognition. Renewed interest in Urban agriculture (UA) amongst scholars and policy makers is a positive development since local and international environments have changed greatly since the 1980s and 1990s, when most of the initial research on the concept was conducted (Crush et al.,2010). United Nation development program (UNDP) estimated that some 800 million people, or nearly 8% of the world's population, are now engaged in urban agriculture worldwide (Gittelman, 2009).

Over the past decade therefore the significance of UPA for poor people's livelihood, poverty reduction and employment generation strategy gaining prominence (Gündel, 2006;Geteet al., 2007; Arkuet al, 2012). Urban agriculture is a traditional practice in Ethiopia, and the urban-

based population is used to keeping cattle, sheep, and chickens, or growing rain-fed crops and vegetables, on the plots adjacent to their houses (Gittleman, 2009). However, in recent years urban agriculture has gained in popularity and is being promoted as a means of sustaining the livelihoods of poor and otherwise unemployed urban dwellers by Ethiopian government (Geteet al., 2007; Mpofu, 2013).

However, the desk study conducted in many Africa countries including Ethiopia, also found that urban agriculture still remains unrecognized, unassisted and discriminate against, when not outlawed (Dimaet al., 2002). In addition, literature widely acknowledges that urban agriculture is marginalized in the planning and development strategies of cities in Ethiopia and that it is often regarded as unimportant, or peripheral, to urban policy making (Mireri, 2010; Thornton, 2008 cited in Jatta, 2013). Consequently, it is largely ignored in the planning and development policies of cities.

1.2. Statement of the Problem

In Ethiopia, urban poverty and unemployment is currently becoming a growing concern especially in large cities of the country. Thus, cities may need to consider agricultural production in urban areas or urban fringe to reduce the food insecurity, unemployment and prevalence of poverty (Tewodros, 2007). Even if urban agriculture is being practiced in all the major urban areas of Ethiopia, only the capital city, Addis Ababa city Administration, has structural arrangement for its implementation (FfE, 2010; Mpofu, 2013).

Currently, Ethiopian Government has acknowledged the contribution of Urban Agriculture towards the creation of employment and incorporated it in Micro and Small Enterprise (SME) programs. Furthermore, in Bishoftu Town because of the abundance of water bodies and ground water, there are acres after acres of flower farms, industry, developed urban horticultural, poultry and dairy farms within the confines of the Town in various scales. This trend is not only expected to continue, but would expand its coverage throughout the neighboring areas of the Town (OUPI, 2009). However, in the absence of a clear policy framework, official attitudes towards the production of food in cities range from mainly tolerance with legislative backing in some instances, to illegality. Renewed interest in the topic did not necessarily converge with

new knowledge about UA; but little is known about the true extent and impact of UA in urban livelihoods in general.

Moreover, in many studies of UA, researchers has mainly been interested and emphasized its role towards household food security (Tewodros, 2007; Messay, 2010; Aina, et al., 2012; Arku et al., 2012; Mpofu, 2013; Jatta, 2013,Linwattana, 2013). While the true capacity of the sector towards employment creation has not been in depth revealed. Therefore, the aim of this study is to determine the factors that affect UA towards employment creation in the study areas. The general objective of the study is to determine the factors affecting UA for employment generation. The study limited to the urban agriculture that has been performed inside the town, which implies that it did not covers the Peri-Urban Agriculture (PUA). Furthermore, though urban agriculture is practiced in all major cities, the investigation only based on the information collected from Bishoftu town. This is because in this particular city there are large numbers of small and micro urban farmers and big agribusiness industries as compared to other similar cities (OUPI, 2009).

2. METHODOLOGY

2.1 Description of the Study Area

Bishoftu Town is also located at a distance of 47 km from Addis Ababa at south east along Addis Ababa-Djibouti road. Although it is a Woreda administrative centre, Bishoftu Town is the fourth largest urban center in Oromia Region in its population size, next to Adama, Jimma and Shashemene and indeed one of few Towns in the country with a threshold population of over 100,000 (Ibid). Bishoftu has an elevation of 1,920 meters (6,300 ft). The weather conditions are 18°C, Wind NW at 6 km/h, 58% Humidity (Wikipedia). Because of many lakes, vast military camps, many research and educational institutions, industrial establishments and large urban agricultures such as Genesis Farm, ELFORA Poultry and LEMA milk producers association are found within the Town. Its area is believed to be much larger than implied by its population size. Hence, according to the institute's assessment, Bishoftu Town currently occupies geographic area of about 9511 hectares.

2.2. Sampling Procedures and Techniques

Thus, sample was taken from two forms of farm enterprises for primary data i.e. MSE level Farms (MSEF) and household level farms (HLF). Thus, 42 of MSEF most common and popular types of farming (poultry, dairy, fattening, vegetable producer and nursery) were included purposively. From each MSEF, the manager of the farm was used to fill questionnaire. In addition, according to Bishoftu urban agriculture desk office, a large number of household level farm operators (HLF) exist in the town and around 1311 HLF were found in the two randomly selected kebeles (smallest city administration unit). Then, stratified sampling was employed to select the sampled respondents from the two kebeles' using probability proportional to size (PPS). Thus, the sample size was determined by using Yemane's (1967) sample size formula. Therefore, it was assumed that 0.5 the maximum variability of the population; and a desire level of 95%confidence and ±10% level of precision expected, the resulting sample size was approximately 93. However, 32 dairy, 26 poultry, 16 fattening, 11 nurseries and 11 vegetable farms were selected using Proportional probability to sample size (PPS). The computations of sample size were as follows;

$$n=\frac{N}{1+N(e)2}=\frac{1311}{1+1311(0.1)2}=\frac{1311}{14.11}=92.91\approx 93$$

Where,

n- Sample size, N- Population size, e- required precision level (error term)

For contingency purpose 5% or five additional questionnaire one for each stratum were distributed. Therefore, the questionnaires were filled by a total of 135 farmers, including 42 from MSEF and 93 from HLF.

2.3. Sources and Methods of Data Collection

Both primary and secondary data sources were used for this study. The primary data were collected from the sample urban farmers through pre-tested structured interview schedule or questionnaire. Moreover, secondary data were obtained from the offices of Bishoftu Small and micro enterprise office, Bishoftu investment bureau, Bishoftu trade and industry office, Bishoftu Urban Agriculture desk office and Bishoftu city Admisntration.

2.4. Methods of Data Analysis

Descriptive statistics such as frequency distribution, mean, standard deviation, proportions and percentage were employed to analyze the data pertaining to the contribution of UA towards employment creation. In addition, inferential statistic such as one-way Analysis of One Way Variance (ANOVA) was applied to test the significance of the research questions whenever necessary. Similarly, the contribution of UA to employment creation was studied in respect to the share of employment created by UA compared to other activities in various forms and size of organization in the cities. Moreover, a Multiple Linear regression (MLR) model was also employed to determine the factors that affect employment. The research employed SPSS version 20 and STATA 12 for data analyses. MS-Excel was also used for drawing graphs and plots depending on its convenience.

Model Specification

The Regression analyses (MLR) were done to explore the relationship between urban household farm operators and employment generation. First, employment generation was considered as dependent variable (Y), and was regressed against various explanatory factors (Xs) which were assumed to influence farm employment generation. The model used was explicitly expressed as follows below;

$$Yi = \beta0 + \beta1\ X1 + \beta2\ X2 + \beta3\ X3 + \beta4\ X4 + \beta5\ X5 + \beta6\ X6 + \beta7\ X7 + \beta8\ X8 + \beta9\ X9 + \beta10\ X10 + \beta11\ X11 + ei$$

Where:

Yi represents the number of full-time employees of the farm

$\beta0$ = constant

βi = estimated coefficients of the explanatory variables

Xi = explanatory variables

ei= error term

The following list shows explanatory variables considered during regression analysis and their specification.

Table 1: Variables in the model and measurements

No	Definition of Variables	Variable Name	Type of variable & measurement	Expected sign
Dependent Variable				
	Average Employment created	NO_EMPY	Continuous	
Independent Variables				
1	Age of the farmer	AGEF	Categorical: 1 if age b/n 15-24, 2 if b/n 25-34, 3 if b/n 35-44, 4 if b/n 45-54, 5 if b/n 55-64, 6 if greater than 65.	_ negative
2	Education level of the farmer	EDUF	Dummy: 1 if illiterate, 2 if primary education, 3 if high school, 4 if diploma holder, 5 if degree holder and above	+ positive
3	Experience	FRM_EXP	Continuous	+ positive
4	Type of farms	TYUA	Dummy: 1 if vegetable, 2 if Nursery, 3 if Poultry, 4 if Fattening, 5 if Dairy	+ positive
5	Family size	FSZ	Continuous	- negative
6	Marketed Surplus	MKT_SUP	Continuous	+ positive
7	Access to credit	AC_CREDIT	Farmers Perception Dummy: 1 if very low, 2 if low, 3 if medium, 4 if high, 5 if very high	+ positive
8	Access to inputs	AC_INPUT	Farmers Perception Dummy: 1 if very low, 2 if low, 3 if medium, 4 if high, 5 if very high	+ positive
9	Access to land	AC_LAND	Farmers Perception Dummy: 1 if very low, 2 if low, 3 if medium, 4 if high, 5 if very high	+ positive
10	Access to Market	AC_MKT	Farmers Perception Dummy: 1 if very low, 2 if low, 3 if medium, 4 if high, 5 if very high	+ positive
11	Farm Income	AM_FINCM	Continuous	+ positive

The analysis was done using OLS (ordinary least square) regression model (Y= ßX + e) with the assumption that the model error, e, is independently and normally distributed or INN (0, σ2), and has expected value of zero and equal variance in the target population (Gujirati, 2003).

4. Result and Discussion

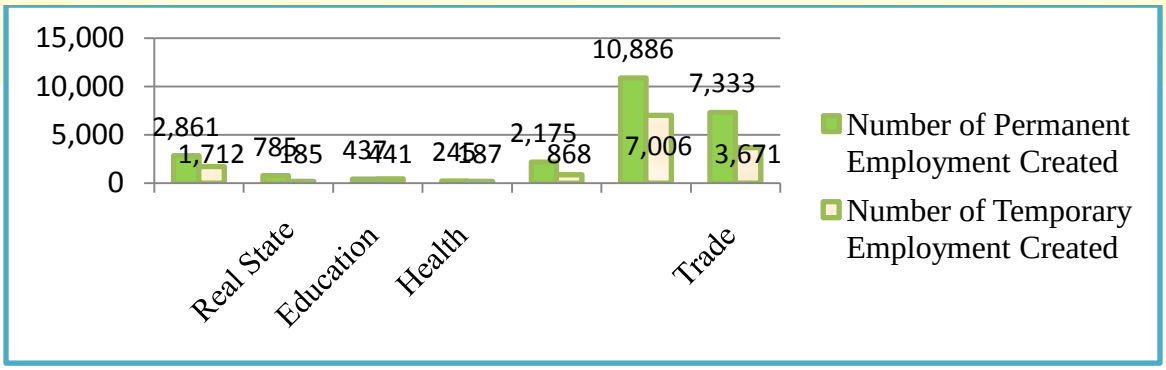
4.1. The Contribution of UA to Employment Generation

The finding reveals that as compared to other socio-economic activities by the number of investments made so far, UA and its allied activities has created huge number of employment opportunities. The contribution of UA to employment has been seen in various size and forms of UA subsequently.

4.1.1. Employment Created by Large Investment Farm

The contribution of UA towards employment creation has been conducted in respect to the percentage share of employment created as compared to other activities/sectors. Thus, the result of the survey in figure 10indicates that the investment level farm projects have created 2,861 (11.57%) permanent full time jobs and 1,712 (12.17%) temporary jobs. From this, out of the seven types of investments activities indicated in Figure 10, farm investment projects ranked third in creation of permanent employment next to manufacturing 10,886 (44.03%) and trade 7,333 (29.66 %). Similarly, farm investment project were ranked third in creation of par-time employment, next to manufacturing 7,006 (49.79%) and trade 3,671(26.09%) of employment first and second respectively (Appendix table 8). Thus, one can easily see that farm investment contribute massive employment opportunity as compared to its share in investments (10.83%).

Figure 1: Types of sector investments and Percentage share of employment created



Source: Bishoftu investment Office (2014)

4.1.2. Share of Employment Created by SMEF

As can be seen from the Table13, SME level farm has created 377 (19.74%) and 341 (14.4%) employment opportunity to female and male respectively so far, as of the total SME employment opportunities created. Both in terms of number of enterprise and the employment opportunity creation UA ranked 3rd next to different trades and service. However, employment generation proportional to the number of SME, UA was the highest. This implies as compared to other types of activities, SME level farm has largely contributes to employment opportunity. This can be easily seen in the figure 11, 12 and 13 below.

Table 1: Distribution of employment opportunity created by various types of SME

No	Intervention Area (Types of activity)	Number of SME	Rank in terms of number of SME	Distribution of Employment created by sex			Share of employment created by the various types of activities	Rank in terms of employ ment creation
				Male	Female	Total		
1	Manufacturing	100	4th	198	270	468	10.93%	5th
2	Construction	159	3rd	411	142	553	12.91%	4th
3	Service	175	2nd	326	604	930	21.71%	2nd
4	Different trades	549	1st	636	978	1614	37.68%	1st
5	Urban Agriculture	91	5th	341	377	718	16.76%	3rd
	Total Activity	1,074		1,912	2,371	4,283		

Sources: SME office (2014)

For instance, in figure 11it is indicated that the proportion of UA (SMEF) to the total SME was 8.9%. On the other hand, figure 12 shows as the average employment created by UA (SMEF) were 16.77%. This implies the relative proportional contribution of employment to the relative number of enterprise is nearly double (1.98).This figure is the highest as compared to other types of SME (figure 13). It is followed by different trades (1.36), service (1.33), manufacturing (1.17)

and construction (0.87).Therefore, according to the result of the survey, one can see easily that UA has huge contribution to employment generation.

Figure1.Proportional activities in SME

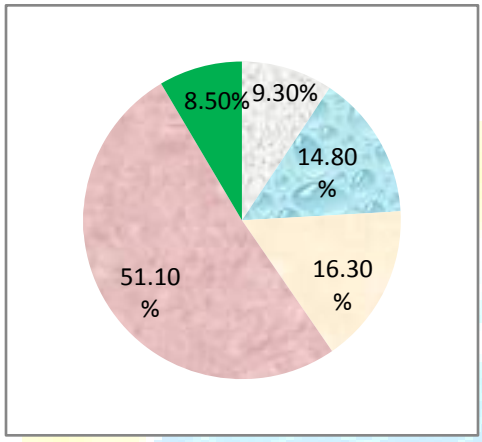
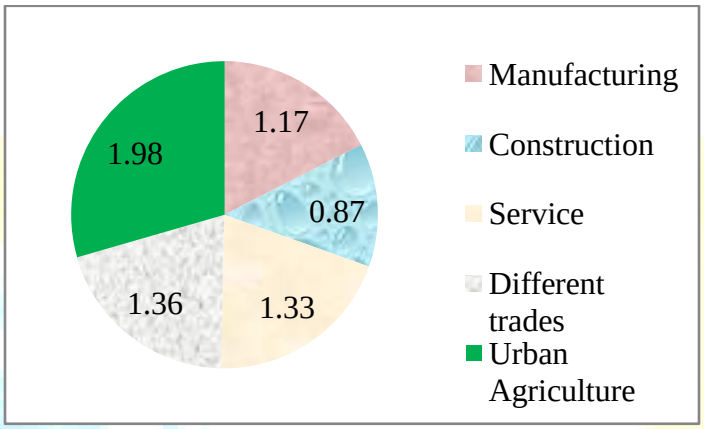


Figure2. The relative proportional contribution of employment of various types of SME



Sources: SME office (2014)

4.1.3. Employment Generation by different Forms of UA

Employment generations by forms of farming enterprise were analyzed in respect to comparing the employment generation by HLF and SMEF. The result of the survey shows that there has been a variation among the different form of UA in the number of employment created. For instance, Table 14 shows that the average number of fulltime employment created by HLF was 1.76, with the standard deviation (SD) of 0.487. This refers to, the average of fulltime employment opportunity created by the HLF, range from 1.36 to 2.24 in 95% CLand P< 0.05. However, the average number of fulltime employment created by SMEF was 5.57 with SD of 2.529. This indicates that the average number of fulltime job created by SMEF ranges from 4.78 to 6.36 persons in 95% CL and P< 0.05. This shows us there is wide variation among various forms of farming in employment generation. The ANOVA test also found that that there is a significance difference in employment generation among different forms of farming and the test is significance at 1% significant level. In addition, the variation has been also significant in creation of par time employment. HLF has created an average of 1.34 number of employment. However, SMEF created an average of 3.57 par time employment. The ANOVA test also found that there was significant difference in a par time employment generation and the test was at significant 1% significant level (Table, 14).

Table 2: Distribution of employment generationof UA by form of farm enterprise

Nature of the job created	Form of Farming	n	Mean	Std. Dev. (SD)	95% CL for Mean		F-Value
					Lower B.	Upper B.	
Full time job created	HLF	93	1.76	0.487	1.36	2.24	252.013***
	SMEF	42	5.57	2.529	4.78	6.36	
	Total	135	3.60	2.477	2.38	3.32	
Temporary/par-time job created per year	HLF	93	1.34	0.915	1.16	1.53	47.814***
	SME	42	3.57	2.804	2.70	4.45	
	Total	135	2.04	2.013	1.69	2.38	

***, Statistically significant at 1%probabitly level

Sources: survey result (2014)

From the above discussion, despite the contribution of HLF, the average level employment created by SMEF was much higher both in terms of; average of full time employment opportunity created (i.e. 5.57 compared to 1.76 of SMEF and HLF respectively), and average par-time employment created per year (i.e. 3.57 compared to 1.34 of SMEF and HLF respectively). The ANOVA also show that there was significant difference in employment creation of SMEF than that of HLF, and found significant at 1% significant level (Appendix table 1). This shows that SME is a better approach in creation of employment opportunities than household level farming. However, the contribution of the household level farms should not be overlook, rather appreciated since it has also multiple roles to the household. The study thus further analyzed the factors that affect the labour use by the sampled household farm operators, so that their capacity towards employment also can be enhanced, through strong support from the concerned body. Thus, the subsequent section will present the result and discussion of the econometric analysis.

3. Result and Discussion of Econometric Analysis

MLR were the econometric methods that used in the study to address the third objectives. In this part we present the results and discussion about the determinants of urban agriculture's employment contributions.

3.2. Regression Diagnostics

Before running the MLR with respect to the study objective data were checked for outliers, co linearity and hetroscedasticity. Accordingly, the existence of outliers was checked using STATA explore method. Primarily, we employed parameters linearity test in STATA to verify whether the specified model is linear or not in parameters and we found F (31, 62) = 453.99 significant at 5% probability level. This indicates that we have to accept the null hypothesis that all estimated parameters are linear with degree zero.

The existence of strong multicollinearity seriously affects the parameter estimates of the regression models, it is necessary to check it's occurrence among the explanatory variables. The variance inflator factor (VIF) and coefficient of contingency (CC) (Gujarati, 2003) were used to check the existence of multicollinearity for continuous and discrete explanatory variables, respectively.

Moreover White's general test for heteroscdasticity is one of the best approaches that we used because it makes few assumptions about the form of the heteroscedasticity. Since, the χ^2 test statistic from auxiliary regression of this study is less than the corresponding value from the statistical table; we accepted the null hypothesis that the disturbances are homoscedastic. Besides, we run robust variance regression to test absence of heteroscedasticity. This implies that still we can use Ordinary Least Square (OLS) estimation method to detect source unknown heteroscedasticity in the regression, consequently our standard errors could be appropriate i.e. efficient and unbiased and hence any inferences we make could not be misleading.

Finally, the collected data diagnosed, to detect the presence of serial auto-correlation. Theoretically, we assumed of the Classical Linear Regression Model (CLRM's) errors that Cov $(u_i, u_j) = 0$ for $i \neq j$, i.e. Similarly, we hypothesized the aforementioned assumption in our specific study. This is essentially the same as saying there is no pattern in the errors. Obviously we never have the actual u's, so we use their sample counterpart, the residuals. If there are patterns in the residuals from a model, we say that they are auto correlated (Gujiratii, 2003). For this sake, The Durbin-Watson (DW) is a test for first order autocorrelation - i.e. it assumes that the relationship is between an error $v_t \sim N(0, \sigma_v^2)$ and the previous one ρu_{t-1}. Since $\hat{\rho}=0$ and DW= Nearly 2 we

did not reject the null hypothesis and implies no or little evidence for first order autocorrelation. The coefficient estimates derived using OLS in this study are still unbiased but efficient, i.e. they are Best, linear unbiased estimates, even in large sample sizes. Hence any inferences we make could not be misleading.

As indicated in our hypothesis, with the exception of some outliers and allowing for some level of difference among farmers, the general distribution follows a linear pattern. Hence a linear functional form could reflect the relationship between the dependent and independent variables. Mathematically, the model or functional relationship is expressed in the methodology part equation 1 on page 30: We can estimate equation 1 by OLS under the condition that the error term and the regressors are not correlated. In our model, however, the no of employed persons could be correlated with the error term, and, if so, it is potentially endogenous. The literature indicates that the probability of correlation between the error term and a regressor (in our case, total laborer employed) is high when some factors explaining the variation in the dependent variable (in this case, total marketed surplus) could also affect the regressor. Applying standard least squares (OLS) to equation (1) under these circumstances results in inconsistent estimates, that is, as the sample size approaches infinity the estimates of the parameters on average will not equal the population estimates. However, after employing detection test we found the opposite and reject using remedy for this problem, applying a two stage least squares, 2SLS (also called the instrumental variables (IV) procedure), where instead of the value of marketed surplus another variable that can correlate with it but not with the disturbance term was substituted.

Table 3: MLR Result on determinants of UA labour contributions

NO_EMPT	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
15>=AGEF<=24	-0.0008	0.2160	0.00	0.997	-0.4327	0.4310
25>=AGEF<=34	0.0924	0.2008	0.46	0.647	-0.3089	0.4937
35>=AGEF<=54	-0.1192	0.2053	-0.58	0.564	-0.5296	0.2912
55>=AGEF<=65	0.0865	0.3254	0.27	0.791	-0.5641	0.7370
AGEF>65	0.2519	0.3195	0.79	0.433	-0.3867	0.8905
EDUF-Read And Write	0.0006	0.1273	0.00	0.996	-0.2539	0.2552
EDUF-Primary	0.1669	0.1370	1.22	0.228	-0.1069	0.4407

EDUF-High School	0.1809	0.1393	1.3	0.199	-0.0976	0.4595
EDUF-Diploma	0.3268	0.2172	1.5*	0.081	-0.1073	0.7609
EDUF >=Degree	1.5686	0.6098	2.57**	0.013	0.3478	2.7893
FSZ	0.0819	0.0458	1.79*	0.079	-0.0097	0.1734
FRM_EXP	0.0154	0.0124	1.24	0.218	-0.0093	0.0401
TYUA-POULTRY	0.3605	0.1804	2.00*	0.050	-0.0001	0.7211
TYUA-NURSERY	0.0503	0.2463	0.2	0.839	-0.4420	0.5426
TYUA-FATTENING	0.1891	0.2934	0.64	0.522	-0.3974	0.7756
TYUA-DAIRY	0.4669	0.1680	2.78***	0.007	-0.8027	-0.1311
AC_CREDIT=LOW	-0.1294	0.1381	-0.94	0.352	-0.4053	0.1466
AC_CREDIT =MEDIUM	0.3270	0.1951	1.68*	0.099	-0.7169	0.0629
AC_INPUT=LOW	-0.6011	0.4025	-1.49	0.140	-1.4057	0.2035
AC_INPUT=MEDIUM	-0.8193	0.4356	-1.88*	0.065	-1.6901	0.0515
AC_INPUT=HIGH	-0.6479	0.4161	-1.56	0.125	-1.4796	0.1838
AC_INPUT=V.HIGH	-0.6143	0.4547	-1.35	0.182	-1.5233	0.2947
AC_MKT= LOW	0.4016	0.1544	2.6***	0.012	0.0930	0.7102
AC_MKT = MEDIU	0.6321	0.1158	5.46***	0.000	0.4006	0.8636
AC_MKT = HIGH	1.2007	0.3261	3.68***	0.000	0.5488	1.8526
AC_LAND-LOW	0.4049	0.2335	1.73*	0.088	-0.0618	0.8716
AC_LAND-MEDIM	0.4261	0.2391	1.78*	0.080	-0.0518	0.9040
AC_LAND-HIGH	0.8567	0.2828	3.03***	0.004	0.2914	1.4221
AC_LAND-VHIGH	1.7992	0.3557	5.06***	0.000	1.0882	2.5101
MKT_SUP	0.0040	0.0207	1.95*	0.055	-0.0001	0.0817
AM_FINCOM	0.0002	0.0000	7.8***	0.000	0.0001	0.0002
Constant	4.163216	1.83817	2.260**	0.058	-0.183364	8.509797

*****, ** and *, statistically significant at 1%, 5% and 10% probability level respectively**

Table 4: Model fitness output of STATA 12

MLR Model	Source	SS	df	MS	Number of obs =	93			93
					F(31, 62) =	54.02	ust	ML	453.99

Model	191.895619	31	6.190181	Prob> F	=	0.000		0.000
Residual	7.10438082	62	0.114587	R-squared	=	0.9643		0.9643
				Adj R-squared	=	0.9464		
Total	199	93	2.139785	Root MSE	=	0.33851		

Multiple linear regressions were employed to investigate factors affecting Employment generated by the sample household farm operators. Thus, the number of fulltime employee was used to determine the total number of employment generated and it is a continuous variable that measures the number of fulltime employee currently working in the farm. The analysis was undertaken for randomly selected 93 household level urban farming types. Respondents in the study revealed that they were not employ only full time laborers but also hired par time and casual labors in peak production period. They pointed out that some urban farming type were used more fulltime labor due to their nature. The results in Table 15 revealed only twelve independent variables that affect the employment creation contribution of urban agriculture with respect to household operators. It was hypothesized that as the age increases, the more conservative of the farmer to use more labour, which in turn affect negatively the number of fulltime employee used.

3.3. Discussion of the Model Output

The adjusted R2 indicates that about 95% of the variation in urban agriculture full employment contributions were attributed to Family size, having better education level, being poultry and dairy farm operator, better perception on the availability of input and market access and agricultural holding size, and higher average monthly farm income generated.

The coefficient of family size was found significant ($p< 0.1$) and it indicates that family size affects the average number of fulltime employees used by UA. Thus, the results suggest that when number of family member increased by one unit, all else equal, the employment contribution of a given UA would reduce by 0.33. The decrease in employment contribution would mean that the number of fulltime workers used by the farm in creating fulltime job opportunity by UA operator would also decrease.

As observed from the results in table 15, the number of fulltime workers used by UA operator was significantly ($p < 0.1$) influenced by those respondents having the mentality of medium credit and inputs, land access and ownership, respectively, holding 10+3(Diploma) education level, engagement in poultry and having more marketed surplus. The results indicate that being in the category of respondents perceived as they had medium credit and diploma holders', employment generated are increased by nearly 0.33. When the respondent is in the category of respondents perceived as they had medium input other than else, the contribution reduced nearly by one employee. Any more household engagement in poultry farm contributes to employment generated by 0.36. In addition, the tendency of the farm increases the proportion of their product to sale to the market (marketed surplus) by 1 percent or 100 percent; it would increase the contribution of the farm towards employment creation by 0.0041 or 0.41 respectively.

Moreover, the result indicates that farmers with a higher level of education have positively related to employment creation. Thus, the higher number of engagement by degree or above qualified farmers, the higher the UA contributes to employment. To this end, the coefficient of sample farmers holding degree and above was significant ($P < 0.05$) and indicates that the number of employee increased by 1.56, when engagement by the stated level of education.

The regression in Table 15 revealed that the perception of farmers having the required land size as one of the positively related and statistically significant ($P<0.01$) determinants of UA employment creation potential. This indicates that perceiving the possibility to expand the farm size by sample households increase the number of fully engaged employees by two employees on average.

The result showed us the number of employment created varies from one type of farming activity to the other. Hence, the coefficient of engagement in dairy farm was found significant ($P<0.01$) and indicated that any more household engagement in dairy farm contributes to employment generated nearly by 0.47.

Finally, the coefficient of average monthly farm income was found significant ($P< 0.01$) and positively affecting the number of fulltime employment by a given UA types. The coefficient

0.00012 implies that when the mean monthly farm income entertained by households that operate different UA practices increase by 1 Ethiopian Birr or 10,000 ETB, would increase its contributions to employment creation by 0.00012 or 1.2 respectively.

5.2. Recommendation and Policy Implications

In order to overcome the challenges and to capitalize the sector's benefits the following policy recommendations has been forwarded:

The long term plans of Oromia region, particularly, Urban Agriculture policy of cities should not only strive to increase the efficiency and employment contributions of SMEs, side by side the existing and new coming household level UA operators should be promoted and supported particularly through increasing their access to land, technical assistance, inputs, market and so that their productivity and profitability could reduce urban livelihood problems and employment creations.

Moreover, since higher level of education holding diploma and above has significantly influence the contribution of UA to employment, unemployed educated youth should be encouraged to engage in UA activities. Further, awareness creation training should be arranged and provided to various levels of the community and government officials so as to change the attitudes of various level officials.

Thus, beside's educating people about benefits associated with the significance of UA through formal training/education, other informal medias should be encouraged. So, there is a need to promote; agricultural extension agent services, NGOs and other institutions that can provide technical assistance, training and various types of information on urban agriculture and development issues.

Special educational or training curriculum must be developed which bases the unique feature of UA so as to produce special extension worker thereby reduce the lack of professional in the areas. This may also enhance the capacity of UA desk office with the required skilled professionals'. The office thus could play an important role for provision of extension services

and organized full package training on specific type of farming so as to get rid of confusion and doubt of farmers.

Platform of collaboration should be prepared by the city administration which requires participation of a number of stakeholders such as UA desk office, city land administration office, and environmental protection office, urban development office, financial institution mainly from MFI, investment office, SME office, revenue office, gender office, and other civic society so as to brainstorm and reach on a general consensus on issues to be critically considered in policy formulation.

The lack of policy guideline impeded the growth and success of the sector, thus, government should devise specific policy guidelines that contain clear rules, procedure and line of authority for the administration of UA in cities and towns. Moreover,the result showed that, the extent and significance of determinants were not similar. So in policy formulations, one should duly recognize the inherent differences and design integrated strategies for the respective observed and unobserved HLFs and SMEFs employment contribution factors heterogeneity in the city.

Finally, the sector requires further investigation on various issues particularly its effects on environmental pollution and health, applying cluster development approaches to household farming, and the extent of macro economy, and implication of other macro policy analysis and the like. Moreover, since monthly farm income of the sample households are one of the positively relating and statistically significant factors for UA employment creation potential. Further researches should focus and continuous exploration has to be made in such a way that income and profitability enhancing specific determinants could be found and incorporated to national and regional plan.

4. REFERENCES

- Abraham Kassa. 2012. Challenges and prospects of riverbank urban agriculture: the case of Mekanisa, Gofa and Saris vegetable producer cooperative. MSC Thesis, Addis Ababa University, Addis Ababa, Ethiopia. (http://etd.aau.edu.et/dspace/handle/123456789/4363) Accessed on October, 2014.

- AdugnaEneyew and WagayehuBekele. 2012. Determinants of livelihood strategies in Wolaita, southern Ethiopia. Wudpecker Research Journals, 1(5): 153 -161.
- Anim, D.K.F. 2011. Factors affecting rural household farm labour supply in farming communities of South Africa. J Hum Ecol, 34(1): 23-28.
- Aina, O.S., Oladapo, A., Adebosin, G. and Ajijola W.S. 2012. Urban Livelihood: urban agriculture implication in food security, a case study of Ibadan metropolis. Journal of Applied Hytotechnology in Environmental Sanitation, 1(4): 155-161.
- Arku, G., Mkandawire, P., Aguda, N. and Kuuire, V. 2012. Africa's Quest for Food Security: What is the Role ofUrban Agriculture?The African Capacity Building Foundation (ACBF), Occasional Paper No.19, Harare, Zimbabwe.
- Awasthi, P. 2013. Urban Agriculture in India and Its Challenges. International Journal of Environmental Science: Development and Monitoring (IJESDM), 4(2): 2331-1289. (http://www.ripublication.com/ijesdmspl/ijesdmv4n2_12.pdf)Accessed on May, 2013.
- Axumite G/Egziabher., Lee-Smith, D., Maxwell, D., G. Memon, P. A., Mougeot, L.J.A. and Sawio, C.J. 1994. Cities Feeding People An Examination of Urban Agriculture in East Africa. International Development Research Centre (IDRC), Ottawa, Canada.
- Bassey N.E., n.d.Labour choice decisions among cassava crop farmers in AkwaIbom State, Nigeria**.** International Journal of Food and Agricultural Economics, 2 (3): 145-156
- BereketTadese. 2010. The role of micro and small enterprises in employment creation and income generation. A survey study of Mekelle City, Tigray Region, Ethiopia. MA Thesis, Mekele University, Mekele, Ethiopia.
- Bryld, E. 2003. Potential, problems and policy implications for urban agriculture in developing countries. Journal ofAgriculture and Human Values, 20: 79- 86.
- Mireri, C.P. 2010**.** Assessment of the contribution of urban agriculture to employment, income and food security in Kenya: A case of Kisumu municipality. African Journal of Agricultural Research, 8 (23): 2884-2896. doi: 10.5897/AJAR10.656.
- Cofie, O., Larbi, T., Danso, G., Abraham, E., Kufogbe, S.K., Henseler, M., Schuetz, T. and Obiri-Opareh, N. 2005. A narrative on urban agriculture in Accra metropolis. RUAF Programme. Accra, Ghana.

(http://www.ruaf.org/sites/default/files/Accra%20UA%20Policy%20Narrative.pdf) Accessed on June 6, 2013.

- Crush, J., Hovorka, A. and Tevera, D. 2010. Urban food production and household food security in southern African cities. Urban Food Security, 4. Queen's University and AFSUN, Kingston and Cape Town, South Africa.
- Dima, S.J., Ogunmokun A.A. and Nantanga, T. 2002.The status of urban and peri-urban agriculture, Windhoek and Oshakati, Namibia. A survey report prepared for Integrated Support to Sustainable
- Development and Food Security Programme (IP) in FAO. University of Namibia and the Ministry of Agriculture, Water and Rural Development. Windhoek, Namibia.
- Egyir, S.I. and Beinpuo, E. N. 2009. Strategic innovations in urban agriculture, food Supply and livelihood support systems performance In Accra, Ghana. Department of agricultural economics, and agribusiness, University of Ghana, Legon, Ghana.
- Ellis, F., Kutengule, M. and Nyasulu A. 2003. Livelihoods and rural poverty reduction in Malawi. World Development, 31(19): 1495-1510.
- FAO (Food and Agriculture Organization). 2007. The Urban Producer's Resource Book: A Practical Guide for Working with Low Income Urban and Peri-Urban Producer. Rome, FAO, 2007. Rome, Italy. (ftp://ftp.fao.org/docrep/fao/010/a1177e/a1177e.pdf) Accessed on June 14, 2014.
- FAO (Food and Agriculture Organization). 2007. Profitability and Sustainability of Urban AndPeri-Urban Agriculture. Agricultural Management, Marketing and Finance, FAO, 2007 Occasional paper 19.
- FAO(Food and Agriculture Organization)., 2008. FAO's Initiative on Soaring Food Prices Guide for Immediate Country Level Action. Occasional Paper 5.Rome, FAO, 2008. Rome, Italy.
- FfE (Forum for Environment). 2010. Ethiopian Environment Review No. 1. Edwards, S.(eds). Addis Ababa, Ethiopia.
- Garrett, J.L., 2000. Achieving Urban Food and Nutrition Security in the Developing World: Overview. Focus3. Brief 1. International Food Policy Research Institute (IFPRI), Washington DC, USA.

- GeteZeleke, Trutmann, P. and Aster Denekew. 2007. Fostering New Development Pathways: Harnessing Rural-Urban Linkages to Reduce Poverty and Improve Environment in the Highlands of Ethiopia. Proceedings of a planning workshop on Thematic Research Area of the Global Mountain Program (GMP), 29-30, August 2006. Addis Ababa, Ethiopia.
- Gittleman, M. 2009. Urban Expansion in Addis Ababa: effects of the decline of urban agriculture on livelihood and food security**:** Undergraduate thesis Presented at the United Nations 17th Commission on Sustainable Development, Tufts University.
- Gündel, S. 2006. Synthesis of Urban and Peri-Urban Agricultural research. Final report for synthesis of information produced on urban and peri-urban agriculture research by the RNRRS programme, 1995-2006.
- Gupta, S.P. and Gupta, M.P. 2002. Business statistics. Suttan Chand and Sons, New Dehli, India.
- Hungwe, C. 2006. Urban agriculture as a survival strategy: An analysis of the activities of Bulawayo and Gweru urban farmers, Zimbabwe.(http://www.cityfarmer.org/ZimbabweSecurity.html#security) Accessed on November 24, 2012.
- Gujarati, D.N., 2003. Basic econometrics. 4th Edition, McGraw Hill, New York, USA.
- Linwattana, G. 2013. Keynote address. Proceedings of regional workshop on strengthening Urban and Peri-Urban Agriculture towards Resilient Food Systems in Asia (UPAFSA), pp.3-9. 20-30, January 2013. Food and Agriculture Organization (FAO). Bangkok, Thiland.
- Jatta, S. 2013. Urban agriculture, price volatility, drought, and food security in developing countries. MPRA Paper No. 46544. University of Rome, Rome Italy. (http://www.mpra.ub.uni-muenchen.de/46544/) Accessed on June 8, 2013.
- Kutiwa, S., Boon E. and Devuyst, D. 2010**.** Urban agriculture in low income households of Harare: an adaptive response to economic crisis**.** J Hum Ecol, 32(2): 85-96.
- Maxwell, D. 1998. Does urban agriculture help prevent malnutrition? Evidence from Kampala. FoodPolicy, 23: 411-424.

- Maxwell, D., 2000. The Importance of Urban Agriculture to Food Security and Nutrition. Nairobi:CARE-East Africa Regional Management Unit, pp. 23-25. Nairobi, Kenya.
- MessayMulgetaTefera, 2010. Food Security Attainment Role of Urban Agriculture: A Case Study FromAdama Town, Central Ethiopia. Journal of Sustainable Development in Africa, 12(3) : 1520-5509
- Mkwambisi, D.D., Fraser, G. D. E. and Dougill, J. A. 2010. Urban agriculture and poverty Reduction: evaluating how food Production in cities contributes to food security, employment and income in Malawi. Journal of International Development. 23: 181–203 (2011). doi: 10.1002/jid.1657. Accessed on August 26, 2012.
- Mougeot L.J.A. 2000. Urban Agriculture: Definition, Presence, Potential and Risks, and Policy Challenges. Havana, Cuba.
- Mougeot, L.J.A., 2005. Urban Agriculture and the Millennium Development Goals. pp. 2-13. In: JA
- Mougeot (ed.), Agropolis: The Social, Political andEnvironmental Dimensions of Urban Agriculture. IDRC, Ottawa, Canada.
- Mpofu P. Z. T., 2013. An evaluation of the performance of urban agriculture in Addis-Ababa City, Ethiopia. Research Journal of Agricultural and Environmental Management, 2(2) : 051-057.
- Nugen, R., 2000. Urban and Peri-Urban Agriculture, Household Food Security and Nutrition. Heinemann., London, England.
- Oromia Urban Planning institute (OUPI), 2009. Structural Plan of Bishoftu Town, Demographic Profile, Utilities and Social Services Final Report, Addis Ababa, Ethiopia.
- RUAF (Resource Center on Urban Agriculture & Food Security). 2013. What is urban agriculture? RUAF, Accra, Ghana. (http://www.ruaf.org/node/512) Accessed on August 30, 2013.
- RUAF (Resource Center on Urban Agriculture & Food Security). 2013. Why is urban agriculture important? RUAF, Accra, Ghana. (http://www.ruaf.org/node/513) Accessed on August 30,2013.

- TesfayeBeshah. 2003. Understanding farmers: Explaining Soil and Water Conservation in Konso, Wolaita, and Wollo. Doctoral dissertation, Wageningen University, Netherlands.
- TewodrosFirdissa. 2007. Livelihood dependence on urban agriculture in Addis Ababa, Ethiopia. MA Thesis, Norwegian University of Life Sciences (UMB), Oslo, Norwegian.
- WB and FAO (World Bank and Food and Agriculture Organization). 2012: Urban Agriculture for Sustainable Poverty Alleviation and Food Security. WB/FAO publication, 2012.(http://www.fao.org/fileadmin/templates/FCIT/PDF/UPA-WBpaperFinal_October_2008.pdf) Accessed on June 14, 2013.