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Determinates of Employment Generation through Urban Agriculture: The Case of Bishoftu Area of Oromia Region, Ethiopia

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Abstract
Agriculture is as an important tool to create urban employment and improve urban livelihood. In light of this, this paper attempted to look at the status and employment contributions. To meet this objective, both secondary and primary data were collected. To analyze the data, both descriptive and inferential techniques were applied. The result indicated that various types of urban farming such as; poultry, fattening, dairy, fruit and vegetable, nursery and ornamental crops, flowers has extensively been found in the city. The result further showed that the sector has played multiple roles to the farmers such as; a means of income generation, employment and household food supplement. Though the result stated that both form of urban farms contributes to employment generation, those organized by SME has created more jobs (average of 5.6) than that of household level farms (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. In addition to its role to urban farmers', urban agriculture has played a enormous role in supplying; fresh products to the city dwellers, raw materials to agro processing industries and market to their products.
Keywords: Employment, Urban agriculture (UA), Enterprises

Introduction

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). According to FfE (2010), medium variant projection shows that by 2020, one out of every five Ethiopians will be living in an urban area, and by 2030, half of the country's population will be living in urban centers. Similarly, recent literatures indicate that Ethiopia's urban population to triple by 2030 to 32 million (FAO, 2012). Thus, the need for increased food supply becomes even more pertinent in urban areas (Tewodros, 2007; Egyir and Beinpuo, 2009). With the same reason, poverty and unemployment has become critical urban problems (ibid). Thus, Meeting these challenges is increasingly a central issue in poverty reduction and livelihood strategies in urban areas. Thus, cities may need to consider agricultural production in urban areas as best option.

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). For many urban populations, an important source of food is urban and Peri-Urban Agriculture (UPA). 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 (Gete *et al.*, 2007; Mpofu, 2013).

However, literatures in many Africa countries including Ethiopia indicated that urban agriculture remains unrecognized, unassisted and discriminate against. (Dima *et 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.

Urban agriculture is being practiced in all the major urban areas of central part of Ethiopia, particularly in Addis Ababa and the neighboring towns, Bishoftu, Adama, are few to mention. However, many of the major cities have incorporated UA as part of their 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. This trend is not only expected to continue, but would expand its coverage throughout the neighboring areas of the Town (OUPI, 2009). In light of this strong support for UA one must note, however, some fundamental questions regarding this intervention remain unanswered. 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 generation has not been in depth revealed. Therefore, the aim of this study is to assess the status of the sector and its contribution towards employment creation in the study areas.

Objectives of the Study

- To assess the contributions of urban agriculture towards employment generation
- To determine the factors affecting UA for employment generation

Methodology

Description of the Study Area

Bishoftu Town is found in Oromia Regional State and geographically occupies the central part of the country at a distance of 47 km from Addis Ababa. The town has a total population of 154,310 with 48% Male and 52% Female.

Sampling Procedures and Techniques

Sample was taken from two forms of farm enterprises for primary data i.e. small and micro enterprise Farm operators (SMEF) and household level farms operators (HLF). Criteria were placed by the researcher to facilitate selection of the samples. The first criteria were the samples only includes the most common and popular types of farming performed by the majority of urban farmers that are; poultry, dairy, fattening, vegetable producer and nursery. Secondly, only those who were engaged in the aforementioned types of urban farming required to performing the activities at least more than a year. The latter mainly justified that in order to judge on the farm; at least a year of experience by the farmers was required. During the survey, there were 92 SMEF in various form of farming. Nevertheless, only 42 SMEF fulfilled the sampling criteria. Thus, all of the 42 of SMEF that fulfilled the criteria were selected for data collection. The SMEF the managers were taken as respondents of the study.

According to Bishoftu urban agriculture desk office number of household level farms (HLF) in the town were estimated to be 8,900. However, out of the 15 kebele's, the majority of HLF were found in Kebele 1 and 2. Thus, the two kebeles were selected purposively. Then, sampling frame was developed based on the data gathered by the UA office. Around 1,311 HLF were found in the two kebeles as estimated by the urban agriculture core process. Then, stratified sampling was employed to select the sampled respondent from the two kebeles' using probability proportional to size (PPS). According to Bishoftu urban agriculture desk office, 652 and 659 HLF were found in Kebele 1 and Kebele 2 respectively. 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)

Table 1: Sampling distribution among types of UA activities in the sampled Kebele's

No	Types of UA	Total number of urban HLF			Sample size per types of UA		Total sample size per UA
		Kebele 1	kebele 2	Total	Kebele 1	Kebele 2	
	Dairy	243	208	451	17	15	32
	Poultry	161	206	367	11	15	26
	Fattening	124	102	226	9	7	16
	Nursery	87	68	155	6	5	11
	Vegetable producer	37	76	113	3	5	8
	Total	652	659	1311	46	47	93

For contingency purpose 5% or five additional questionnaire one for each stratum were distributed. However, only 93 were employed for data analysis purpose. Therefore, the questionnaires were filled by a total of 135 farmers, including 42 from SMEF and 93 from HLF. Figure 3: Sampling procedures of HLF

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. To generate qualitative data, separate checklists were prepared and applied to conduct key informants interview and Focus Groups Discussion (FGD). A group of 14 key informants' including; UA extension workers, head of UA desk office, head of small and microenterprise (SME) office, kebele leaders, city greening and beatification office, environmental protection office, trade and industry office, investment office, city administration officers' and officials, city land administration, agricultural office were interviewed. In addition, three (3) FGD were undertaken, which was composed of a group of 8 total urban framers both from SMEF and HLF. 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 and Environmental protection office.

Methods of Data Analysis Techniques

Both qualitative and quantitative techniques were employed to analyze the data. Descriptive statistics such as frequency distribution, mean, median and standard deviation, proportion, ratios and percentage were employed. 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

Farming considered as labour intensive particularly in developing countries (Abraham, 2012). Therefore, knowing what factors affects the employment generation of urban farms is crucial for the government since the sector is considered to be one of the major strategies for urban job creation. Therefore, the study tried to examine the contribution of UA towards employment generation and further attempted to determine the factors that affect the household level farms for creation of employment. Thus the determinants of job created by farm household were evaluated using multiple regression analysis (MLR). 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 factors were categorized into three groups as household, farm and institutional characteristics. 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 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, $\sigma2$), and has expected value of zero and equal variance in the target population (Gujirati, 2003).

RESULT AND DISCUSSION

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 10 indicates 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. Thus, one can easily see that farm investment contribute massive employment opportunity as compared to its share in investments (10.83%).

Share of Employment Created by SMEF

The 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.

Table2 : Distribution of employment opportunity created by various types of SME

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 employment creation
			Male	Female	Total		
Manufacturing	100	4th	198	270	468	10.93%	5th
Construction	159	3rd	411	142	553	12.91%	4th
Service	175	2nd	326	604	930	21.71%	2nd
Different trades	549	1st	636	978	1614	37.68%	1st
Urban Agriculture	91	5th	341	377	718	16.76%	3rd
Total Activity	1,074		1,91	2,371	4,283		

For instance, in figure 2 it 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.

Employment Generation by 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 3 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% CL and 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 3 Distribution of employment generation of 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

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.

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.

Table 4 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**

Table5 : Model fitness output of STATA 12

	Source	SS	df	MS	Number of obs =		93		93
Normal MLR Model					F(31, 62)	=	54.02	Robust MLR	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 4 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.

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 5, 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 5 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.

Conclusion

The result of the study indicated that t UA has played a major role in; employment generation, sources of income for farmers, supply of fresh product to the city dwellers and foods supplements to farm households. Moreover, the sector indirectly playing positive role to the development of other sectors such as industries, trade, hotel and cafeterias through provision of inputs and raw material, beautification and greening cities, and serves as an alternative sources of energy (Biogas). Moreover the result indicates that both SMEF and HLF, has contributed an average of 5.6 and 1.76 employment per farm respectively. It was found that as observed that the number of fulltime workers used by UA operator was significantly ($p < 0.01$) influenced by those respondents having better education particularly degree holder and above, perception of better access to land and generating a greater level of average monthly farm income and being engaged with dairy farm. Moreover, it was significantly ($P<0.1$) influenced by those respondents having the perception of a better credit and inputs access, land access and ownership, respectively, holding 10+3(Diploma) education level and above, engagement in poultry type of farming activity.

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