The Impact of Urban Home Gardening on Household Socio-economy

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Abstract

Home gardens are an important consideration in terms of household socio-economy and yet their significance is often unrecognized. This is particularly more relevant in tropical region such as Ethiopia as home gardens have been a way of life for centuries in the region generally and in Mekelle city in particular. The present study tries to examine the urban home garden practices and evaluate their significance towards household socio-economy in Mekelle city. A total of 89 home gardens were randomly selected for the study. A combination of complete plant inventory, demarcation of plots with 10m*10m for tree plants, 5m*5m for shrubs and 1m* 1m for herbs as well as interview were used to collect data. The result showed that the cultivated land size of sample home gardens ranged from 50-500m^2 with mean 214.16m^2. About 99% of the assessed home gardens were established on open areas of their garden in response to getting more environmental benefits, food and cash to support family. Household income from home garden per year ranges from 657.00 to 38000.00 Birr with average per household income of 9411.20 Birr. The regression analysis showed that farm size, distance from water source and distance from nursery site are significantly affected the income of households at less than 1% probability level as well as educational status of the household is also influenced the income from home garden at less than 5% probability level. The present study exposed that contribution of urban home gardening goes beyond gap filling where, economic important and environmental benefited crops dominated in the home garden. Paying due attention to urban home garden development has significant role in addressing household socio-economy benefits in the future. The availability of water, improved seeds and incidence of pests and insects are the most determinant factors that influence the sustainability of urban home gardening.

Keywords: Ethiopia, home garden, household, Mekelle, socio-economy, urban

1. Introduction

Despite its significance and long history, urban agriculture receives significantly lesser recognition by authorities in the developing countries for example in Africa than the developed world. Most recently, however, there is increasing need to sustainably manage urban farming in developing nations (FAO, 2007). Urban home gardening under urban agriculture has played significant role in food security and generating household income. Nevertheless the ability of urban agriculture to continuously supply food for the urban poor depends on better planning based on accurate geospatial information to enable sustainable management of the practice (Addo, 2010).

Urban agriculture including home garden is a dynamic concept that includes a variety of business systems ranging from subsistence production and processing at the household level to more commercialized agriculture. It takes place in different locations and under varying socioeconomic conditions and political regimes. The diversity of urban agriculture is one of its main attributes, as it can be adapted to a wide range of urban situations and to the needs of diverse stakeholder (FAO, 2007). Urban agricultures ability to do so in general and its sustainability in particular, however, is being threatened by population increase due to natural and rural-urban migration, coupled with urban expansion and infrastructure developments that are challenging with urban farming for available space and scarce resources such as water for irrigation (Gittleman, 2009).

Home gardening became shelter for a range of local varieties of trees, crops and livestock breeds, as well as soil micro-organisms. Agricultural scientists stated home gardens as micro-agro ecosystems that are rich in several components of agro biodiversity (Csizmadia, 2004). Empirical studies on home garden agro forestry practices around Jimma, and southern Ethiopia are not enough. As a result, less attention has been given to home garden development towards addressing household food security (Zerihun *et al.,* 2011). On the other hand, studies on traditional mixed gardens have emphasized their ecologically sound and regenerative characteristics, by which they recreate natural forest conditions and minimize the need for crop management (UNICEF, 1982).

According Dereje *et al.*, (2007), over 6500 households currently engaged in agricultural activities, and the obvious desire to obtain land manifested by many more, appears evident that urban agriculture in Mekelle is considered an important livelihood strategy. Therefore, strengthening support specifically for urban agriculture activities, especially high-value vegetable crops, is likely to be an important mechanism for poverty alleviation in the town. The constraints such as cultural dietary preferences (lower per capita consumption of vegetables) and land tenure policy could significantly delay expansion in urban agriculture activities and will need to be taken into serious consideration, but taking a more hopeful view, Mekelle has two very important assets which

would help further sustainable urban agriculture development. First, it's relatively small size, which would permit realistic town-wide interventions, second and very importantly, the current positive interest taken at municipal level towards urban agriculture (Dereje *et al.*, 2007).

Ethiopia has experienced rapid urbanization and increasing urban population in the last few years due to more rural-urban migration and rising per capita incomes (FDRE PCC, 2008). Mekelle is one of the developing capital cities of Ethiopia, which is threaten by insufficient food supply (especially vegetables and fruits), plant species degradation as well as environmental pollution due to rapid urbanization and continues increase in population (MUAO unpublished report, 2011). To reverse these problems, there are some promotions of home gardening practices that produce vegetables, fruits and different home gardening initiatives implemented by government extension system. However, the extent of the problems, existing potentials and solutions to the problems are not documented well. Therefore, this study was undertaken with the following objectives

- ♣ Examining the socio-economic and demographic features of the urban home garden producers
- ♣ Investigating the income and consumption effects of urban home gardening on individual households,
- ♣ Assessing the factors affecting sustainability of home gardening practices in the city.

2. Materials and Methods
2.1. Description of study area: Mekelle city
Mekelle, a rapidly developing city in northern Ethiopia, is located about 780 km from the capital, Addis Ababa. Established nearly 150 years ago by Emperor Yohannes, the city is nestled in Ethiopia's temperate highlands, in the heart of a region that traces its origins back to the ancient Axum Empire that once controlled Red Sea trade (4th century BC – 10 century AD). The city maintains a proud history of many religions, particularly Orthodox Christianity, dating back to the 4th century AD. Mekelle was largely ignored in the latter half of the 20 century by Ethiopia's ruling feudal and socialist governments, but began to experience an economic and cultural rejuvenation with the election of a democratic government in the early1990s (Bryant, 2009). About 2250 ha of cultivable cropland are estimated to be available in the territory under the town's jurisdiction. 6628 households are engaged in urban agriculture mainly in the production of horticulture crops, supplying 27% of products in the town (another 25%of these products originate from surrounding hinterland up to 50 km away (MCPPPO interim unpublished report, 2005).

Geography: Mekelle is located between 130 32' north latitude and 390 28' east longitude and elevation between 2000 to 2270 m.a.s.l. It is located in the northern highlands of Ethiopia, covering total area of 3500 hectares. The eastern side, Enda-Eyesus ridges are the highest peaks of the city. The major land form of the city territory can be classified into four categories namely: flat to gently sloping, gently sloping to rolling, sloping to moderately steep and steeply to very steeply sloping type. Mekelle's location in the region bordered by Sudan and Eritrea makes it a potential foreign trade harbor center (MCPPP, 2007).

Population: The population of Mekelle city is increasing from time to time. The major components of the city inhabitants are small scale merchants, civil servants and daily laborers. The population census of 2007 indicated that the population of Mekelle was 215,914 (110,989 are females and 104,925 are males) and 54,741 household head with 4 average family size per household. Most of this growth is mainly due to in migration (CSA, 2007).

Climate: Mekelle enjoys a mild climate that can be described as Weina Dega. During the dry season, the days are pleasantly warm and the nights are cool; in the rainy season, both days and nights are cool (MCPPP, 2007).

Rain fall: there are two rainy seasons namely the Kiremt and Belg. The rain showers falling in the Belg rain season is too low for growth of plants as a whole. The main rain season is Kiremt whereby sufficient rain and moisture is available for plant growth. It is estimated that the average annual rain fall ranges from 579-650 mm. Even though the amount of rain falling in years is not showing significant difference, the erratic nature of the rain in the day records shows variability at once and didn't rain for weeks (MCPPP, 2007).

Temperature: Mekelle, as part of the globe, is suffering much from global warming aggravated by the neighboring area deforestation and desertification influences. So, in the absence of cooling agent forest in the city and neighboring areas the temperature variation is high even from hour to hour. Out of the four seasons, Kiremt is cooler and Bega is hot. The average maximum temperature per year is 24.1 0c and the minimum is 11.11 0^c. There is a time record where the maximum temperature reaches 29.9 0c and the minimum 1.6 0^c. This shows that there is high temperature fluctuation. Temperature is high in March-May and low in October-December (MCPPP, 2007).

Wind: the high wind speed force blown over the bare areas blew up the dust and fine soil very easily. The blown dust and soil are the serious sanitation and health problems to city inhabitants. The easterly windblown from the east during the dry season for a longer period of time in the year (October-March) is the more serious wind.UA in general urban home gardening in particular has a potential role to tackle the disasters

of global climate change like gusty wind, higher temperature, water stress, soil erosion, flood and deforestation. Figure 1: Map of the study area, Source; Rest office of GIS, 2012.
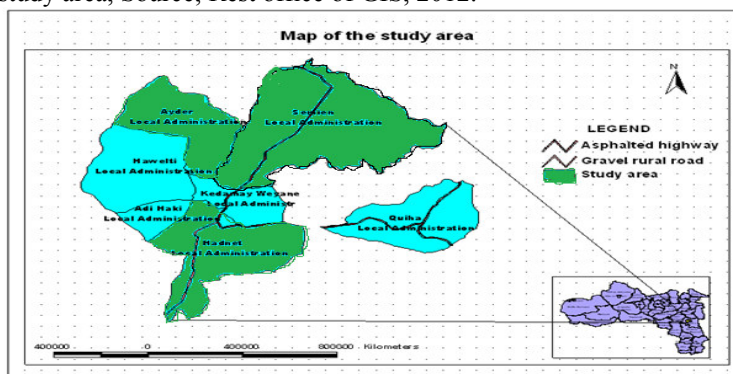
The city is made up of urban and peri-urban areas, and is divided into seven sub-cities which are; Ayder, Semien, Hawelti, Adi-haqqi, Hadnet, Quiha and Qedamay-weyane local administrations. According to Mekelle Urban Agriculture Office unpublished report, in 2011, each of the seven local administrations has urban agriculture offices under their administration. The total land area of Mekelle is 3500 hectare (MCPPP, 2007).

2.2. Study site selection and sampling

The presence of well-established traditional home-garden practices, easy accessibility to important accesses and previous study experiences were important factors for considering Mekelle. The three local administrations for the present study were selected (Ayder, Semien including Tabias Industry and Felegda'aro and Hadnet including Tabias Aynalem and Kebele 17) from the seven current merged local administrations due to their significance amount of home gardens (MUAO unpublished report, 2011).

Two stage sampling technique were employed in this study to collect the primary data. Firstly, the three local administrations (LA) (Semien, Ayder and Hadnet) and 6 Tabias (2 from each LA) were purposely selected due to its availability of home gardens. Secondly, the sample home gardening households were selected from each Tabia with a farm size of less than 500m^2 and greater than 30m^2 and the number of households is calculated according to Cochran's (1977), formula.

$$no = \frac{(t)2*(p)(q)}{(d)2} \qquad n1 = \frac{no}{(1+no/\text{Population})}$$

Where,

n_0 = required return sample size according to Cochran's formula=15.21

n_1 = required return sample size because sample > 5% of population.

t = value for selected alpha level of .025 in each tail = 1.96. (The alpha level of .05 indicates the level of risk the researcher is willing to take that true margin of error may exceed the acceptable margin of error).

(p)(q) = estimate of variance = .25. (Maximum possible proportion (.9) * 1- maximum possible proportion (.1) produces maximum possible sample size).

d = acceptable margin of error for proportion being estimated = .05 (error researcher is willing to except). Having in mind these limitations, the sample size was used in order to arrive at the sample size of 89.

Table 1: Distribution of Sample Households by local administration and Tabias

The study area	Selected local administration	Selected Tabia	Number of home garden producers with 30-500m^2	Sample households
Mekelle		Felegda'aro	243	14
	Semien	Industry	618	15
		Adiha	280	16
	Ayder	Kebele 03	457	15
		Aynalem	272	14
	Hadnet	Kebele 17	446	15

Source: Census of Mekelle urban agriculture office, 2010.

2.3. Data collection methods

The data for this study were collected from primary and secondary sources. Primary data were being obtained from sample households (community representatives, key informants and experts). They were interviewed to get information on the home garden producer characteristics, resource management (i.e. compost preparation and utilization, waste and water utilization) and home gardening production processes, marketing behavior and product distribution methods, home garden product consumption aspects and constraints faced by producers

through semi- structured interview questionnaires.

Focus Group Discussions (FGDs) and direct field observations were also used as a source of primary data. Respondents were asked also about household demography, land holdings, garden history, and factors affecting the sustainability of the practice in city. Secondary data was obtained from available records, internet, published and unpublished materials.

2.4. Data processing and analysis

The quantitative data collected from various sources through interviews, observation, counting and other secondary sources was analyzed by employing version 16 SPSS (Statistical Package for Social Science), Microsoft office excel software and Palanthological (past new 3) software. Descriptive statistics were used to provide a summary statistics related to variables of interest and to examine household demography that benefited through this practice with in household.

To determine home garden product income and consumption effect, number and distribution (%) of sample households by marketable supply of home garden products and how much consumed frequently was also measured. The linear regression analysis was used to see what independent variable was more influenced to income of individual sample households.

3. Result and discussion

3.1. Demographic and socio economic characteristics of home garden households

3.1.1. Demographic characteristics of study site in relation to home gardening

Out of the total urban home gardener households covered by the survey, the proportion of households with family size of 8-9 persons is relatively lower (7.9%) followed by households with family size of 2-3 persons (9%), households with family size of 4 persons reaches 15.7%, households with household size of 7 persons (16.9%) and households with family size of 5 persons (19.1%), The proportion of households with family size of 6 persons is the higher (31.5%) (Table 2). It is interesting to note that the great majority of the households (75.4%) have family sizes of greater than 5 members. Hence, and it is safe to say that the activity supports households with large family size.

In addition to that, MUAO unpublished report, (2011) shows that there are over 11,000 of households were participated in urban agriculture and whose livelihoods are associated with farming in the town. According to Federal Democratic Republic of Ethiopia Population Census Commission (2008) population of Mekelle city is about 257, 290, with annual growth rate of 5.4 percent, and an average family size of 5 people (FDREPCC, 2008).

3.1.2. Socio-economic characteristics of study site

Age, sex, educational level and marital status

The age of respondents ranged from 35 to 68 years with a mean of 47.3. The great majority of the urban home gardeners (78.4%) belong to the age group above 40 and below 60 years. Only 4.5% households of the selected gardeners are over 60 years of age (Fig 1). On the other hand, the proportion of the urban home garden farmers group below the age of 40 and above the age of 18 years contains about 16.9%. Hence, it is safe to say that most of the participants in the activity belong to the medium age groups. So that the age group between 40 and 60 years is mostly participated on the home gardening practice.

As regards the distribution of the urban home garden farming household heads by sex, males are predominating in the heading of the activity (56.2%). But the 85.4% of female house hold members are participated actively in this practice. This indicates that, the urban female garden members are adapted and practiced by themselves to produce foods from their garden to their kitchen.

About 29.1% of the sample respondents did not attended school. From these 19 % are illiterate (they can't read and write) and 10.1% can only read and write but they had not attended school, 18% educated in primary school, 30.3% educated in secondary school, and the remaining 22.5% attended college and above. It is interesting to say that out of the total home garden farming households covered by the survey, more than half (52.8%) have been attended above secondary school (Table 3). it is also important to note that urban home garden farming is practiced by people with different educational levels ranging from the illiterate ones to those who attended university.
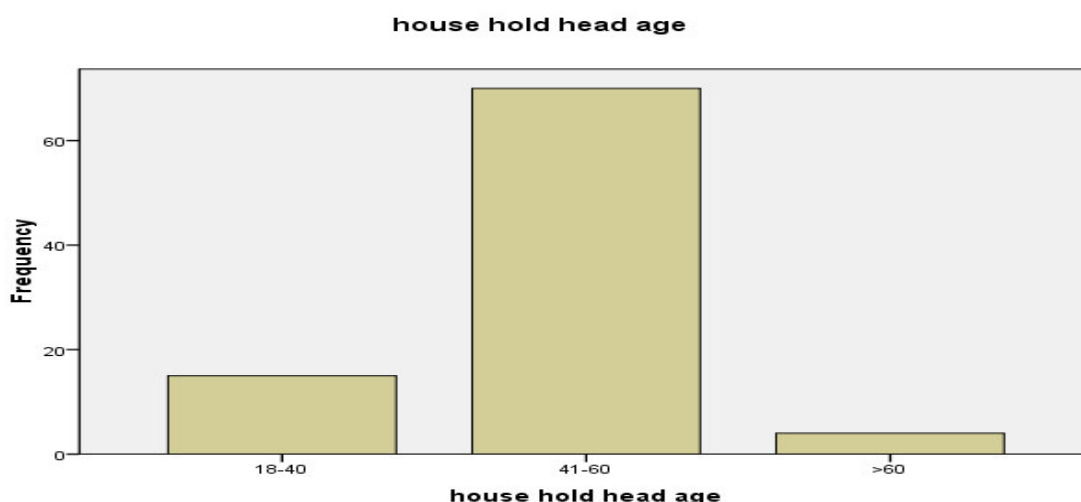
Figure 2: Distribution of respondent households by age group

More than three ¬- fourth (76.4%) of the urban home garden farmers in the sample are married. The proportion of divorced /separated/ household heads takes the second position (20.2%) followed by single household heads (3.4%). From the divorced household heads (94.4%) are females (Table 3).

Table 2: Respondents' socio- demographic characteristics (n=89)

List	Number of respondents	Percent	Remark
Sex			Sex of respondents
Male	50	56.2	
Female	39	43.8	
Educational level			Literate level of respondents
Illiterate	17	19.1	
Able to read and write	9	10.1	
Primary	16	18.0	
Secondary	27	30.3	
Collage and above	20	22.5	
Marital status			
Single	3	3.4	All single respondents are males
Married	68	76.4	
Divorced	18	20.2	17 out of 18 are females

NB. Al most (94%) of the divorced female house hold headed were participated in home garden   activity.

3.2. Occupational characteristics of home garden producers

Table 4 shows that from all of the urban home gardening household heads covered by the survey, the higher value of occupational status covered about 30.3% from the total identified themselves as trader followed by 25.8% as wage labours, 20.3% as governmental employee, 10.1% as business persons (investors), 7.9% as urban home garden farmers (mostly they have large farm land as well as livestock production) and 6.7% are gain their income from house renting and subsidized from their parents (Table 4). Hence, it is evident that the urban home garden farmers are from diverse occupations. As shown in Table 4, trade is the main occupation for most of urban farmers followed by governmental employee.

On the other hand urban farming, home gardening in addition to the livestock production is the main sources of livelihood for some of the proportion of the urban home garden farming household heads (7.9%). This shows that most of the traders in the city participated in home gardening practices. The idea from key informants implies that for most of the trader's work sites were found around their home when comparing to the other livelihood strategies work site. So, traders' have higher opportunity to work and manage their homes with gardening and other additional income source practices. The list % of households was the household whose main livelihood means is urban farming. This is because of difficulty of having enough farm land due to urbanization through time.

Table 3: Number and Distribution of urban home gardeners by Occupational Characteristics (n=89).

Household occupation		
Occupations	Frequency	Percent
Farming	7	7.9
Trader	27	29.2
wage labor	22	25.8
house rent and subsidized	6	6.7
Governmental employee	18	20.3
private business	9	10.1
Total	89	100.0

As for religion, majority of the selected sample households 94.5% belong to the Orthodox religion followed by the 3.3% of Muslim and 2.2 % of Protestants. The Muslims are located in Ayder local administration and all Protestants are located in Hadnet local administration.

3.3. Income Generation and Employment Benefits of Urban Home Gardeners
Most of the home garden farmers obtain the major portion of their home garden incomes from the sale of vegetables, spices and fruit, as considerable percentage of the producers are dependent on home gardening with combination of dairy farm alone and as many of them are also pensioners perhaps with limited alternative sources of income. In almost all the cases, although they also retain unspecified amounts for household consumption, most producers sell a large proportion of the home garden products they obtain. Vegetable production which especially owned by the households that have wider cultivable area is seen as a major and supplemental source of income to meet the family's needs to buy other commodities and purchase inputs for the production of home garden. Generally, the marketing of home garden products, specially vegetables, fruits and stimulants provides the households with a regular source of income. The activity provides employment not only for the household heads and their partners, but also for the children and other household members, and for other people like daily laborer, sellers of horticultural product.

The present study was stated that the net average mean income per household reached 9411.19 birr. The range of net income from home garden per household was gone from 1657.00 up to 38000.00 birr. This income of households was considered all estimated yield of the products that produced by each respondents and the price of products was calculated by request the prices of agricultural products to the marketing assessment experts of the urban agricultural office and marketing agency of Mekelle city. The next histogram tells as that most of the net income of households ranged from 5000.00 up to 15000.00 birr (Fig 3).
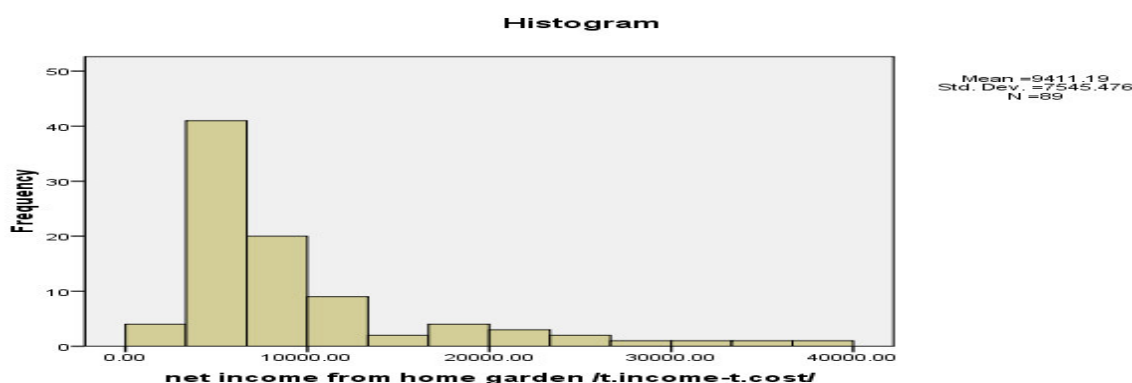

Figure 3: Net incomes of households of the study site

In economies where families spend half or more of expenditures for food, food is the largest industry. Therefore, urban agriculture has the possibility of generating a great many jobs. Farming is an attractive urban industry (Wilfried, 1995). Being close to the market, the urban farmer can tailor produce to market demand, supplying high-value and perishable items. Closeness to the market ensures freshness of food and gives the farmer a commutative advantage through saving the transportation and storage costs (Wilfried, 1995). The present study indicates that the contribution of urban home garden on livelihood means had great difference. The contribution of urban home garden for livelihood of 72% of the household is < 25%, for 22% of the respondent contributed 26-50% of their livelihood means. For the rest 6% of household's home gardening practices contributed above 50% of their income source (Fig 4).
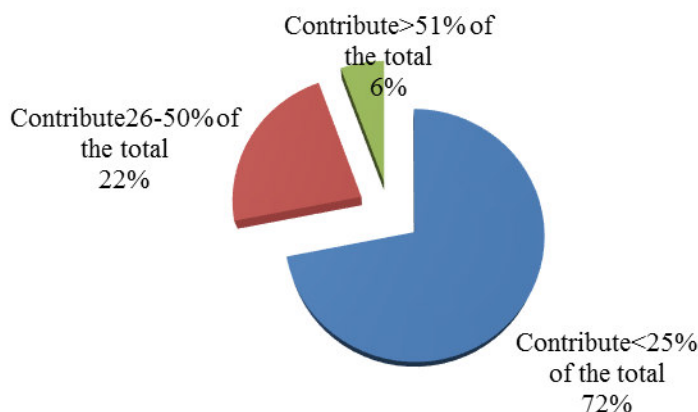
Figure 4: Contribution % of HG as income sources of households

The contribution of home garden for income source in the selected sites was different. Higher contribution that is > 50% was measured in home gardens of Semien and Ayder local administrations. Most households in Hadnet local administration contributed their home garden to livelihood means was below 25% (see table 5).

Table 4: Distribution % of respondents by LA and contribution % of HG for livelihood means

local administration of households	Local administration	Contribution % of home garden for livelihood means			Total
		0-25%	26-50%	>50%	(n=89)
	Semien	19	8	3	30
	Ayder	17	11	2	30
	Hadnet	28	1	0	29
Total		64	20	5	89

Source: own survey data, 2012

3.4. Determinant factors of income from Home Gardening

The regression equation to determine the determinant factors of income is;

***Net HG income** = 2354+3778 educational status of house hold head - 28.8 household head age + 851 household head sex -128 family size of household + 34.9 cultivated land for HG + 0.683 starting capital for HG + 40499 distance from water source for irrigation + 1967 distance from agricultural input services + 7 distance from local market - 2855 distance from nursery site.*

Table 5: Regression analysis of predictors with relation to income of households

Predictor	Coefficient	SE Coefficient	T- value	P-value	VIF
Constant	2354	4857	0.48	0.629	
Household head education	3778	1430	2.64	0.010**	1.2
Household head age	-28.79	80.81	-0.36	0.723	1.5
Household head sex	851	1232	0.69	0.492	1.4
Family size	-127.6	386.7	-0.33	0.742	1.4
Cultivated land	34.890	4.923	7.09	0.000*	1.3
Starting capital	0.6825	0.5194	1.31	0.193	1.1
Distance from water source	40499	7445	5.44	0.000*	1.2
Distance from input service	1967	2354	0.84	0.406	3.3
Distance from local market	7	1623	0.00	0.997	3.0
Distance from nursery site	-2854.9	919.3	-3.11	0.003*	1.3

S = 4806.85   R-Sq = 64.0%   R-Sq(adj) = 59.4%

Source: regression model results

**, * represent level of significance at 5% and 1% respectively.

Education of the household head (Educational status): the result from the regression analysis indicated that education of HHH is statistically significant at less than 5% probability level in relation to explaining income of household from home garden. The educated households are applicable from home garden income than illiterate households positively (see table 5).

Farm size (Cultivated land): The result from the regression model indicated that the coefficient of farm

size is statistically significant at less than 1% probability level in explaining income of household positively from home garden. A possible explanation for this finding is that the farmers with large farm size might have higher product type and amount per unit land and are encouraged to use the land intensively. The marginal effect from the model result shows that an increase in unit measure (m^2) of the landholding increases the probability of income by 34.89birr.

Distance from water source: distance from nearest water source for irrigation was estimated to influence the income of households from home garden. Where farness of the source affects income negatively, the possible reason is the access to water and it minimized the cost of water transportation. The regression model result shows that this variable influences the probability of income negatively and significantly at less than 1 % probability level. The coefficient of the result shows that when home garden lives near water source by one unit (Km), the probability of income increases by 40499 birr.

Distance from nursery site: distance from nursery site was estimated to influence the income of households from home garden. Where farness of the nursery site of fruits and tree plants affects income negatively, the possible reason is the access to improved seedling and it minimized the transportation cost. The regression model result also showed that this variable influences the probability of income negatively and significantly at less than 1 % probability level. The coefficient result shows that when home garden lives away from nursery site by one unit (km), the probability of the income is decreased.

3.5. Nutritional and consumption effects of urban home gardening
Horticultural crops in general and fruits and vegetables in particular are considered to be nature's high in minerals and vitamin contents of food and its nutritional potential great when we compare with other food used by humans as their provides more essential nutrients in significant amounts than any other food. Hence, fruit and vegetable production by the home gardeners in the urban areas tends to increase household fruit and vegetable consumption. The increased consumption of these horticultural crops is therefore assumed to improve nutritional status and food diversity of the households. Urban home gardens guaranteed a regular and dependable supply of food and diversity of food thereby improving the livelihood of the producers.

The food security status of urban households is dependent on many factors, such as; Availability of food through owns production. Figure 9 shows that < 25% of HG products of all LA were used for consumption purpose. The rest > 75% of their HG products were used for selling and other purposes.

On the other hand, from production until the moment food reaches the urban food table, a series of intervention activities such as assembling, handling, processing, packing, transport, storage, wholesaling and retailing increases its price. This raises food price which further increases the ratio of food expenditure. Hence, the urban home garden farmers are at an advantage as they produce part of their own food, cutting short all those interventions and supply fresh food, whereby the activity is vital in improving the family diet and reducing food costs.
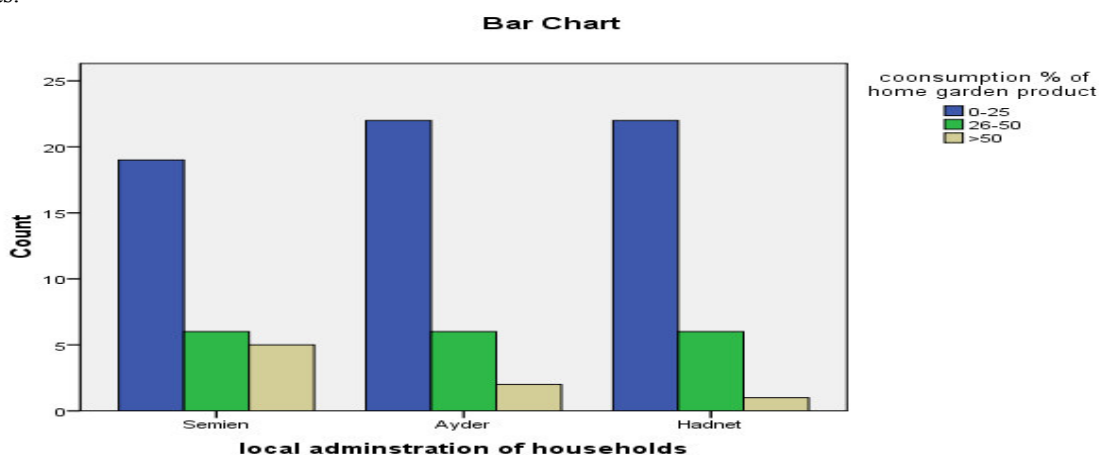

Figure 4: consumption % of HG products by LA
Source, own survey data, 2013

On the other hand, since urban home garden farming is practiced as a supplement for household food supplies acquired from the market, the cash income derived from the selling of home garden products is also used in the purchase of food from the market and to buy other assets. The increased income from home garden enables households to purchase more food and a wide variety of foods whereby the income effect contributes to improving the nutritional status of households. This study tells that the consumption % of households from their home garden was different due to the amount of the product from the garden per household. table 9 describes that most of above two-third of the households in the urban home garden consumed less than 25% of their

products and the rest > 75% of their products were used for selling and animal feed. About 20% of the selected respondents consumed 26-50% of their home garden products. They are characterized by producers with higher home garden product consumers and less sellers. Some (9%) of households were produced home gardening products for only consumption purpose.

Table 6: Consumption % of home garden product by local administration (n=89)

local administration of households	consumption % of home garden product			Total
	0-25	26-50	>50	
Semien	19	6	5	30
Ayder	22	6	2	30
Hadnet	22	6	1	29
Total	63	18	8	89

Source: own survey data, 2012.

In addition, food diversity of households of the study site was affected by the practicing of home gardening inside the urban homes. All of the respondents (100%) told me the positive impact of home garden on food diversity of families and local societies and the group discussion with the key informants were indicated that the main advantage of urban home gardening products is nutritional improvement of the urban society and its urban environmental guarantee.

3.6. Features of the Mekelle home-gardens and the role of food plants

Home-gardens in the study sites provide a number of services to the local people. The primary function of these home-gardens is for quick and fresh access to foodstuffs as justified by the frequency of high number and dominance of food plants. According to Ashebir, (2007) Industry and Aynalem areas were known for their production of vegetable foods such as Swiss chard, lettuce, tomato and pepper. However, these are now replaced by plant species with high economic returns including mango (Mangifera indica), papaya (Carica papaya), banana (Musa paradisiacal) and guava (Psidium guajava). The study of Semien, Ayder and Hadnet Tabias showed some specialization of agricultural tasks and loss of genetic diversity where changes have taken toward replacement of traditional vegetables and medicinal plants by fruit crops.

Home gardens in the local administrations especially in Felegda'aro Tabia mainly produced staple crops e.g., fenugreek (Trigonella foenum-graecum), maize (Zea mays L.) and oat (Cicer arietinum), in addition to vegetable crops such as Swiss chard, lettuce, tomato and pepper and fruit crops such as guava, papaya, banana and Coffee. The possession of the gardens serves as the primary food security strategy for farming communities and supply for the market by merchants and neighboring urban inhabitants. It is a mixed-farming (agro forestry) system. Swiss chard is dominated exogenous vegetable crop cultivated and processed for human food as a major source of vitamins and minerals in the area. The relative frequency indicated that more than 11 dominated species were recognized of which papaya and guava had the highest fruit species contribution to the total relative frequency (see table 10) (4.72 and 4.18 respectively) followed by vegetable species of which swiss chard (4.18) and lettuce (3.15) in the study area. Beside their food value, as cooked and fresh, they characterized by drought resistant and used as an animal feed and agent of suitable air condition for the surroundings. Home gardens in the local administration of Ayder.

4. Conclusion

The study exposed that active participants in urban home gardening are middle aged people with having education and large family size. Female household members are mostly activated on the garden management practices improvement of food diversity to household members.

The gardens cover species related to health, fence, shade, spiritual and recreation needs, as well as financial income sources. As demonstrated in this study, the income level from home garden depends significantly on educational status, size of cultivated land, distance from water source and distance from nursery site. But, less dependent on external inputs, this enhances the integrated natural resource management, waste recycling and species conservation in the area.

A total of 8 functional groups of crops are present in these systems, out of which an average of 5.5 groups exists in each farm. The presence of crops with different functions fulfils the nutritional and monetary needs of the households. The basic food crops, Swiss chard (Beta vulgaris L.) and papaya (Carica papaya L.), which are rich in nutritional value are supplemented by other fruits, vegetables and stimulants in the home garden. This contributes to balanced food diversity, which is necessary for healthy and productive farm families. The income from cash crops of the functional groups contributes to fulfillment of their material and other needs. Sustainability of urban home gardens depends on deferent factors the main are water availability, seed availability, pests/insects, as well as extension support system.

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