

**SUBCONTRACT
NO 5720-03S-011**

**Under USAID/DAI Contract
No. GEG-I-00-02-00014-00**

AMAP Business Development Services (BDS)

**Urban Land use Pattern Assessment Study
In Respect To Urban Agriculture:**

A Case Study of Addis Ababa And Bahir Dar

**Urban Agriculture Programme for HIV Affected Women in
Ethiopia**

REPORT

30 November 2005

Consultant: Zewdu Yilma (PhD)

Table of contents

Page

1	Introduction.....	3
1.1	<i>Background.....</i>	<i>3</i>
1.2	<i>Statement of the problem</i>	<i>4</i>
1.3	<i>Objectives of the study</i>	<i>5</i>
1.4	<i>Methodologies</i>	<i>5</i>
1.5	<i>Scope of the study</i>	<i>6</i>
1.6	<i>Limitations.....</i>	<i>7</i>
2	Literature Review	7
3	General Background of the study area	10
3.1	<i>Addis Ababa.....</i>	<i>10</i>
3.2.	<i>Bahirdar</i>	<i>11</i>
4	Socio-Economic Characteristics	12
4.1	<i>Addis Ababa.....</i>	<i>12</i>
4.2	<i>Bahir Dar</i>	<i>13</i>
5	Agricultural Production pattern	16
5.1	<i>Vegetable Production.....</i>	<i>18</i>
5.2	<i>Livestock</i>	<i>19</i>
5.2.1	<i>Dairy</i>	<i>19</i>
5.2.2	<i>Poultry.....</i>	<i>20</i>
6	Production Pattern –Bahir Dar	21
6.1	<i>Crop</i>	<i>22</i>
6.2	<i>Animal husbandry.....</i>	<i>25</i>
7	Supports and services	26
7.1	<i>Addis Ababa.....</i>	<i>26</i>
7.2	<i>Bahir Dar</i>	<i>27</i>
8	The role of Agriculture in Urban waste management.....	28
9	Major Findins.....	29
9.1	<i>Addis Ababa.....</i>	<i>29</i>
9.2	<i>Bahir Dar</i>	<i>31</i>
10	Major challenges	32
11	Prospects of urban agriculture	33
12	Summary.....	35
13	Conclusions.....	36
14	Recommendations / Interventions	38
15	Literature cited.....	40
16	Annexes	42

1 Introduction

1.1 Background

Urban agriculture is growing of plants and raising of animals for food and other uses within or in the fringe (periphery) of a city and town. It is also production of inputs (e.g. compost) and the processing and marketing of agricultural products. The most common definitions of urban agriculture are based on the : types of economic activities; food/non-food categories of products; intra-urban and peri-urban character of location,; types of areas where it is practiced; types of production systems and product destination and production scale.

A wide range of people are engaged in urban agriculture for a variety of reasons including: economic, nutritional, cultural and social reasons. Urban agriculture is a profitable activity in most of the underdeveloped and developed countries all over the world, for low-income as well as for high-income people. It is different from and complementary to, rural agriculture in local food systems and integrated into the urban economic and ecological system. Growth of urban poverty, food insecurity, malnutrition and a shift in their concentration from rural to urban areas in developing countries come with urbanization. The activities in urban agriculture vary widely within and between countries. During periods of economical or political crisis, urban agriculture tends to increase rapidly since it matches an important survival strategy for the urban poor providing food as well as job

In many of the countries, the urban food system so far is not sufficiently reflected to the urban planning process. However, urban people are not only passive food recipients, in many locations they are also actively involved in food production. Thus city planning should incorporate an understanding of household food security, nutrition conditions and economic forces.

The ultimate objective of an urban plan is a habitable city relatively free of conflicts among dwellers and uses, providing for the needs of its citizens, and maintaining its natural resources. The role of urban and peri-urban agriculture in a city plan is to contribute to those ends. Urban planning should

incorporate urban agriculture in order to improve urban sustainability, enhance the urban food system and avoid or minimize conflicts between agriculture and other resource-use activities.

The proper utilization of land holdings under different components will contribute to the development of the nation's agricultural products. In order to scrutinize this development as well as farmers' attitude towards land use practices a timely and comprehensive land use data is categorized into 5 main land use types, which are: land use under temporary crops; land use under permanent crops; grazing land; fallow land; woodland and land for other purposes.

1.2 Statement of the problem

In many urban & peri-urban areas, agricultural activities—including animal husbandry, horticulture, aquaculture, fruit production, apiculture and marketing are practiced in various locations, usually with little regulations. For the well being of its people and enhancing the national economy a concerned government should integrate agriculture at its top priority to achieve its goal. Inclusion of urban agriculture in urban development plans that is regulated by municipalities reconciles the needs posed by urban growth as it enhances activities of high economic and social value.,

The productive or potentially productive areas of the city that have not been paved over and are not limited to communal farms and private gardens. Riverbanks and roadsides parks, lands that cannot be used for buildings in various cases, and those surrounding refuse dumps make up much of municipality territory. Planning for the use and exploitation of these spaces require assessing the potential through the use of appropriate management tools.

Both in urban and rural settings incentives for producers to invest are compromised by lack of security concerning land tenure and the fear of exile. People usually ask why erect terraces, build irrigation reservoirs, or improve and fertilize the soil if there are no guarantees by the government that benefits will be reaped from those investments. Taxation rules and legal frameworks are therefore necessary to provide security and incentives for producers.

Food supplies to cities are important components of the footprint of cities and key issues in the growing urban. The numbers of people who go to bed with out any food are increasing year after year. Most of the poor spend the highest percentage of their scarce income on food and the other on health

care and medicine. Urban agriculture is the potential means to overcome the growing hunger; to create low-cost employment and generate income; to produce natural medicines and contributes to recycling wastes and wastewater. These must be integrated to ensure food security in cities.

The environment in the cities is one of the challenging constituent in managing the safe and balanced urban ecology. The surrounding rural areas and natural resources are even being affected by cities. Most wastewater from domestic, commercial, Institutional and industrial sources are being discharged into surface water drains and streams running through the city. There is no systematic monitoring of water quality on going in the city at present and no enforceable regulations to prevent pollution of waterways. Thousands of tons of wastes and cubic meters of wastewaters are not being used or treated at a high cost, which can be recycled or transformed into sources of natural fertilizer, irrigation water and nutritional supplements for animals.

It seems there is untapped potential for urban agriculture to contribute to household food security and to improve the environment in all the urban settings in Ethiopia.

1.3 Objectives of the study

- To assess the present land use pattern for various agricultural services in the urban settings
- To assess and identify the opportunities and major constraints of the communal/kebele land for urban gardening in comparison to using household gardens
- To assess the environmental impacts with emphasis to solid waste management and sanitation of the cities.
- To indicate the potential and prospect of the urban agriculture
- To identify areas of intervention and role of the stakeholders towards the healthy development of the sector

1.4 Methodologies

Reconnaissance survey was made to improve the understanding of urban agriculture through direct observation and discussion with groups of households involved in agriculture in different part of Addis Ababa. Based on the information generated from the reconnaissance survey, structured questionnaire were developed to quantify some of the data during the informal survey. The questionnaires were administered by trained enumerators.

In Addis Ababa, five sub-cities (Kolfе-Keranyo, Arada, Yekka, Nifas-Silk-Lafto and Akaki- Kaliti) were selected purposely considering the urban agricultural activities in these areas. In these sub-cities, there are 49 kebeles and two kebeles were selected from each sub-city using proportional to household size. In each kebele selected, 20 households were randomly sampled making a total of 200 households to be interviewed. As all households are not practicing agriculture, identification of households that practice any form of agriculture was done within the selected kebeles continued until the desired sample size is attained.

In Bahir Dar there are totally 17 kebeles. Out of the seventeen kebeles five kebeles were identified for enumeration based on their physical/geographical representation of the city. Twenty households who are engaged in urban farming from each kebele were randomly identified as enumeration area

In both Addis Ababa and Bahir Dar cities, solid waste management is very important and recently it was observed that agriculture in the cities is contributing to the environment by reusing the household waste. To measure this contribution different environmental assessment methodologies were employed. Contingent valuation method is appropriate in this type of valuation and key informants were employed to assess the impact of reusing solid waste in agriculture.

Data collected through informal survey from various groups of households were summarized in a way that it explains the urban agriculture structure in the city. On the other hand data collected through structured questionnaire were coded and entered into the computer system and analyzed. Descriptive analysis were used to analyze the data and substantiated/quantified with the information obtained during the group interview.

1.5 Scope of the study

- The study focuses on urban agriculture sector in respect to the city land utilization system.
- The study particularly gives attention to urban agriculture sector in relation to environment in respect to solid waste management.
- The study areas are five representative sub-cities in Addis Ababa and six representative Kebeles in Bahir Dar.

1.6 Limitations

Lack of detailed information as well as census of the households who practice urban agriculture as a result of low emphasis given is the major bottleneck in undertaking this study. Budget allocated for this study does not allow to scrutinize different issues and collect more detailed information given the complexity of urban agriculture. Moreover, the city, particularly Addis Ababa is so vast and complex to undertake such type of study within the limited time and budget. Looking to the low priority given to the sector by the government in the city, there is poor documentation and many of the information do not help to give inferences. As a result, this report can give only preliminary highlight of the agricultural activities in the two cities and could be used as starting document for further studies.

2 Literature Review

Urban growth is changing the face of the earth and the condition of humanity. In the coming century humanity is turning itself into an urban species, where large cities but not villages and towns are becoming habitat. Only in a century global urban populations have expanded from 15 to 50 per cent of the total population. In 1800 it was only London city over a million people, but by 1990 540 million people are accommodated in 100 worlds' largest cities out of which 220 million lived in 20 largest mega cities.. The cities of the 21st century are where human destiny will be played out, and where the future of the biosphere will be determined. It is unlikely that the planet will be able to accommodate an urbanized humanity that continues to draw upon resources from ever more distant hinterlands, or which uses the biosphere, the oceans and the atmosphere as a sink for its wastes at the current accelerating rates. The challenge faced is whether cities can transform themselves into self-regulating, sustainable systems. Is it possible to make cities socially, economically, as well as environmentally viable and sustainable in the long term? The answer to this question is critical to the future well being of the planet, as well as of humanity. There can be no sustainable world without sustainable cities.

The largest land surfaces required for feeding cities in developed countries are for producing grains, and animal feed such as maize and soybeans to meet the demand for meat. Countries with huge population, such as China and India, demand for land to feed cities will continue to grow. Sooner or later, cities that have come to take large-scale food imports for granted may need to consider reviving

agricultural production in urban areas or the urban fringe to reduce the demand for land surfaces elsewhere.

With labor forces growing by 2-3% per year in the fastest urbanizing countries (East and West Africa, Southeast Asia, East Asia), thousands of new jobs must be created each year in each of the major cities in those regions. For example, in order to keep the unemployment rate from rising, more than 250,000 new jobs are needed each year in Jakarta, more than 77,000 jobs in Ouagadougou, and more than 44,000 in Dar es Salaam. Partly as a result of the job market lagging behind urban growth, urban poverty and the share of the poor living in cities are rising (IFPRI 1999). These trends have serious implications for food security.

Cities have enormous potential for food growing. Some literature revealed that in various countries the urban metropolitan areas produced up to 50% of the food produced for the city dwellers. UNDP (1996) has estimated that urban agriculture produces between 15 and 20 % of the world's food. The 1980 US census found that 30% of the dollar value of US agricultural production was produced from urban metropolitan areas. By 1990, this figure had increased to 40%. Smit et al. (1995) reported that: there are 80,000 community gardeners on municipal land in Berlin with a waiting list of 16,000. Bamako, Mali, is self-sufficient in vegetables and produces half or more of the chickens it consumes. Dar-es-Salaam, one of the world's fastest growing large cities, now has 67% of families engaged in farming compared with 18% in 1967 and urban agriculture is the second largest urban employer accommodating 20% of the employed.. Presently, 65% of Moscow families are involved in food production compared with 20% in 1970

The commercial agriculture in Mexico City's peri-urban area contributes substantially to the local economy. In the peri-urban regions, up to 19% of total employment is in agriculture (Pablo Torres Lima, L.M.R. Sanchez, B.I.G. Uriza in Bakker et al. 2000). The annual gross output of over ten thousand urban agriculture enterprises in the city of Dar es Salaam totaled 27.4 million USD, with an annual added value amounting to 11.1 million USD. In 1991, the individual urban farmer's annual average profit was estimated at 1.6 times the annual minimum salary (Sawio, 1998). As a producer of inputs for downstream use, urban agriculture contributes to food processing, marketing and packaging

activities that generate economic earnings and some employment. For instance, a dozen types of food processing are done in Cagayan de Oro, Philippines (Potutan et al. 2000).

In Harare, savings accruing to small-scale urban farmers are equivalent to more than half a month's salary (Tevera, 1996). In Nairobi in the early 1990s, agriculture provided the highest self-employment earnings among small-scale enterprises and the third highest earnings in all of urban Kenya (House et al. 1993).

Livestock keeping has been part and parcel of human settlements since the start of civilization and it has been part of urban agriculture in many growing cities. Urban and peri-urban dairy production systems are among the many forms of dairy production systems in the tropics and sub-tropics. The systems involve the production, processing and marketing of milk and milk products that are channeled to consumers in urban centers (Rey et al., 1993; Staal and Shapiro, 1996). Livestock keeping in cities has special problems and opportunities indeed. Among the problems is the waste disposal system and the opportunities are the market for its perishable products.

The livestock enterprise/production addresses rural-urban linkages as a result of peri-urban crop production. Contrarily to animal production in developed countries, animal husbandry in cities of developing country is heavily dependent on crop residue produced in the peri-urban farms around the city for feed. Being in the city, allows for a low level of transport and distribution cost which will keep sale prices low. Moreover, the shorter time it took to reach the consumer will help in maintaining the quality of the animal product.

Urban agriculture also contributes substantially to the urban ecology by improving the microclimate, reducing energy use (less transport, storage losses and packaging), greening of the city and the productive re-use of urban wastes. One of the features which distinguish it from rural agriculture is that it is integrated into the urban economic and ecosystem (*Mougeot, 2000*). A research study undertaken in the urban farm of the industrial city of Kharkov, Ukraine indicated that wastewater which was subjected to advanced biological wastewater purification treatment have benefited in enriching the soil with higher value of macro and micro nutrients and enhanced to increase the yield as well as the quality of winter wheat and green fodder under intensive use of land irrigated with city's sewage (Zewdu, 1987).

Urban agriculture is a traditional practice in Ethiopia. It makes a considerable contribution toward satisfying the basic needs of the urban population. In Addis Ababa even the smallest-scale backyard producers with very low capital earned above-average profits (Egziabher, 1994). Vegetable production within the Addis Ababa satisfies about 30 % of the demand of city, and cereal production, though not significant, also contributes a little to the food supply of the city (Eyassu, 2000).

Urban agriculture can also play a vital role increasing biodiversity. The urban environment is often, richer in flora and fauna than rural farmland. It is often home to more trees and flowers than intensively farmed agricultural land with large fields, limited crop diversity and little uncultivated area. With regard to atmospheric pollution and global warming, urban agriculture can help much to contribute in reducing the net discharge of CO₂, one of the gases contributing to global warming, from activities in cities. Urban agriculture is a means for reducing the net discharge of the gas, because plants and trees capture carbon dioxide gas.

The above-mentioned facts and figures show that urban agriculture is a vital component of the livelihoods of urban dwellers and also contributes to the sustainability of cities in various ways – socially, economically and environmentally.

3 General Background of the study area

3.1 Addis Ababa

Addis Ababa is one of the fastest growing cities of Africa. The population growth and urbanization rate of the city exhibits about 3.7 % and 15 %, respectively (CSA, 2003). It is located in the central plateau of the country extending 8°55' and 9°05' latitude and 38°05' and 39°05' east longitude with an altitude of 2,408 meters above sea level, and is surrounded by the Entoto Massive in the north and agricultural land to the west, south and east. (Urban Finance, 2000)

The urban area is endowed with numerous streams and rivers starting from the north-west and north-east and running southwards into the Awash river. The Kebena, Ginfile, Bantiyktu, Buhe Akaki and the Kechene rivers flow through the City. The average annual rainfall is about 1160mm while the mean annual temperature ranges between 11-17⁰c in the highland areas to 20⁰c in the lower parts of the City.

The soil type varies from the unfertile red clay soil in the north to the thick black cotton (vertisol) soil in the flat plains of the south. In addition, Filwuha- a renowned hot spring is situated in the center of the City.

Land, the largest economic resource of the City Administration, comprises about 21,000 hectares of built up area including green and open spaces and 30,000 hectares of expansion area. As far as suitability of the land is concerned, the inner part of the City is overcrowded and congested while the expansion area's appropriateness is limited by physical conditions (floody, marshy, etc areas) and others (lack of job opportunity, inaccessibility, etc.). In general, the land use pattern of the metropolitan area of Addis is dominated by cultivation (50.4%) and grazing (19.2%). Forest/wood bush land accounts for 6.8 % and there are marshy/swampy areas in many localities, currently used for grazing. Settlement and related uses occupy about 21%. The current pattern of settlement in Addis Ababa is attributed to the fast and chaotic inflow of population from the whole country due to social, political and economic consequences.

In Addis Ababa, more than 60 % of the residents are living below the poverty line. The city's labor force is growing at the rate of about 6.2 % per annum while the economy can absorb only 4 % of this growth. As a result, the rate of unemployment in Addis Ababa that accounts for, 40%, is one of the highest in the world.

3.2. Bahirdar

Amhara regional state is one of the several regional states of Ethiopia. The total land area of the state is 170,000 square kilometers and the population size is 17.26 million. More than 11 % of the total population is urban dwellers. Bahir Dar is the capital of the Amhara National Regional State. It is located by the side of Lake Tana and the riverside of Blue Nile locally known as river Abay. The geographical coordinate of the city is 11°35'30'' N and 37°23''E and the topography of the city is predominantly flat with an altitude, ranging from 1786 to 1870 meters above sea level. The slope varies from near to zero to some 20 % in few hillsides. However in most parts of the city the slope is below 2 %. The general terrain gradient of the city area is slightly towards the river Abay basin that covers approximately 95 % of the watershed. Bahir Dar is one of the three highly populated cities of

the Amhara region. The population of the city is estimated to be 153,293 with 5.5 per cent annual average population growth. Today the city is developing into metropolitan composition. The total area of Bahir Dar is 16,000 hectares of land with buildings accounting for more than 900 hectares. Out of the total surface area 17.2 % is covered with water. Though there is no well-defined course of surface water drainage, the direction is dominantly towards Abay River except some areas that drain into Lake Tana. The average annual maximum temperature of Bahir Dar is 26.2^oc. The warmest season occurs during March to May while the mean annual minimum temperature is 10.9^oc and the mean daily temperature is 18.5^oc. The mean annual rainfall is 1224mm.

4 Socio-Economic Characteristics

4.1 Addis Ababa

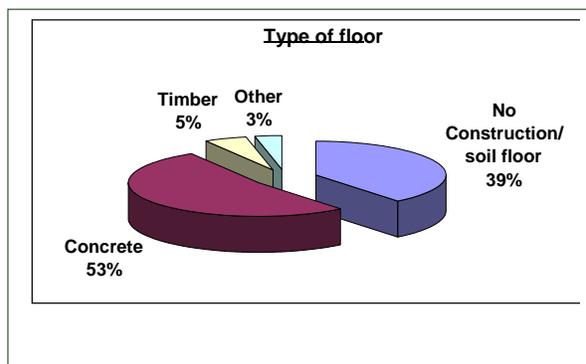
In Addis Ababa, a total of 200 urban agricultural practitioner households have been sampled in five representative sub cities and two kebeles were sampled from each sub city. These sub cities are Arada, Kolfe Keraniyo, Yeka, Nifas-Silk-Lafto and Akaki-Kaliti. From the enumerated households, 2%, 25 % 28% are cereal, horticultural crops and dairy producers, respectively. About 13% are poultry raisers, close to 10 % are goat raisers and fatteners, 1% are bee keepers and the rest were undertaking mixed type of urban agricultural practices. These figures in general clue that the majority of urban farmers are widely participating in dairy farming and horticultural production activities.

The surveyed result of the Demographic structure of the city revealed that 25 % of the urban agriculture household members are under the age range of 6-17 years, 69 % are found in the age range of 18-65 and about 3 % are above 65 years old. The survey on the educational attainment indicated that 29 % of the households have attained basic education, 13 % elementary level education, 20 % each junior and senior education, about 9 % tertiary and the remaining are illiterate. Regarding to the gender structure of the agricultural households in the Addis Ababa the percentage is almost equal. Out of the total surveyed households about 82 % of them have 1-5 family members and the remaining 18 % have 6-10 family members.

The type of house in which the households leave to some how indicate the relative economic status of the households although it may not exactly shows the livelihood status. The majority of the households (about 93%) leave either in their own house (65%) or house rented from Kebele (28%). This clearly

indicates that the urban agriculture, particularly if managed in the leaving compound, has secured working place. The remaining 7% who leave in rented houses from individuals mostly undertake their agricultural activities out side the leaving compound.

In order to see more on the livelihood the type of construction material of the houses including wall, ceiling and floor may be important. Accordingly, the majority of floor type is concrete made (53%) followed by no floor construction (39%) roughly showing there are large proportions of poor households.



Similarly, construction material of the wall for 88% of residences is from wood and mud. On the similar vein close to 86% of the house do not have ceiling and under cold weather of Addis Ababa residence without ceiling may show how the households are poor. Only about 9% do have cloth sheet for ceiling.

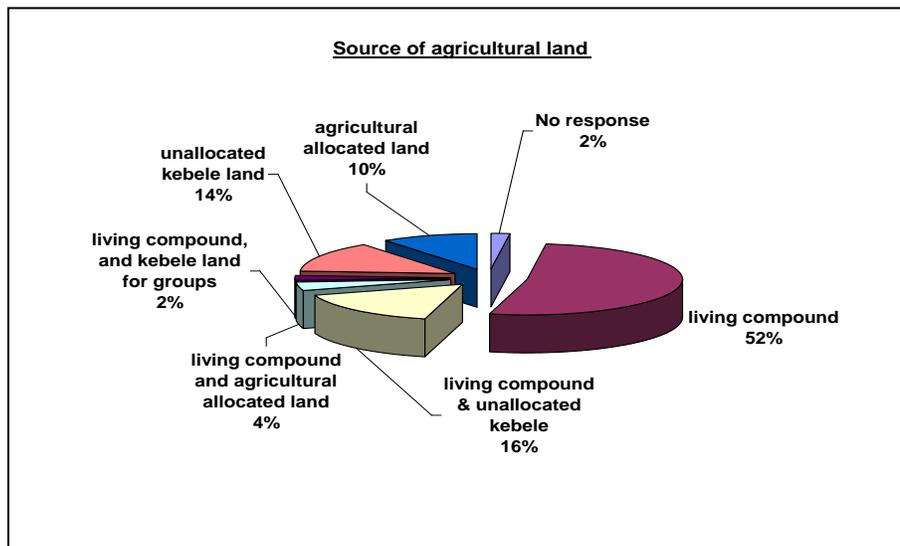
4.2 Bahir Dar

In Bahir Dar, a total of 100 urban agricultural practitioner households were sampled in six representative kebeles out of 17 total kebeles. From the enumerated households, 2 % were cereal producers, 16 % are horticultural crops producers, 54 % are engaged in animal husbandry and the rest are undertaking mixed type of urban agricultural practices. In general, in one way or the other, 46 % were engaged in cereal/horticultural production and 76 % are participating in animal husbandry. This picture in general clues that the majority of urban farmers are widely participating in animal husbandry.

In order to closely scrutinize the livelihood structure of these urban farmers, the enumerates were questioned in what kind of houses they reside. Accordingly the majorities (82 %) of them reside in their own houses, 10 % in houses not recognized by the city municipality, 6 % in rented from private house owners and the rest were living in kebele/ government rented houses. On average the sampled households have 3 rooms per house and 294 meter square of living compound.

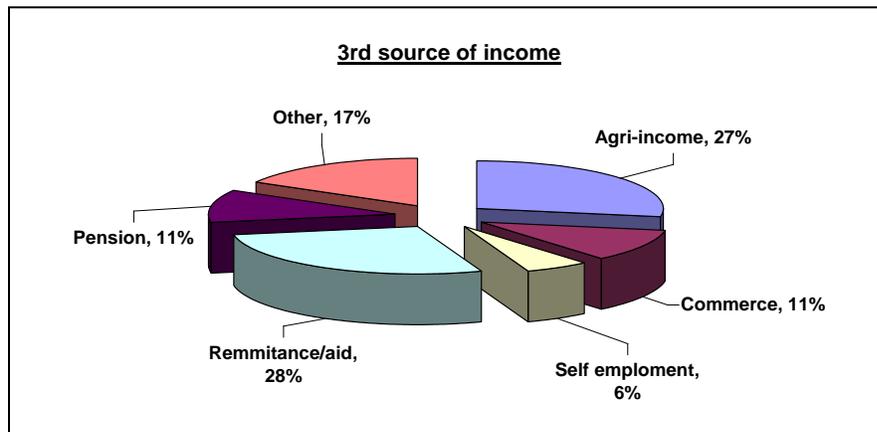
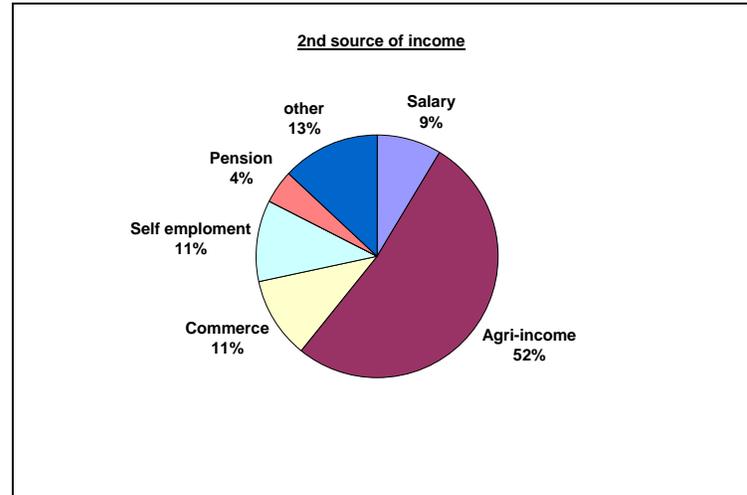
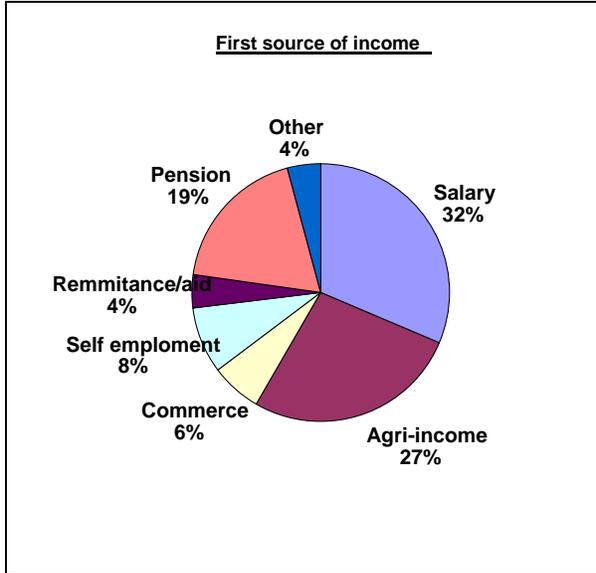
Concerning the type of construction material that the houses are made from, a scrutiny was undergone on type of floor, wall and ceiling. The study showed that 82 % of their houses are constructed from wood and mud wall, where 68 % of the houses the floor is a bare land and close to 94 % of the houses' roof is made of corrugated iron sheet. These figures in general show how urban farmers in the city dwell in poor residential houses.

On the other hand the sampled households were asked to depict source of agricultural land. The response revealed, 52 % are working in living compound and 16 % are working both in living compound and on kebele land. This depicts that most urban farmers are restricted to work in their own living compound (for details see the next pie chart).



To assess whether urban agriculture significantly contributes to the income structure of the household or not income sources are classified into three categories as shown in the chart beneath. . Having this

in mind, the sampled households have been inquired to depict their most important sources of income in their order of significance. Results revealed, salaries, agricultural income, and remittance were found to be sources of income in that order of importance.



The above-illustrated pie charts clearly signify that agricultural income contributes greatly to the income structure of the urban farmers of Bahir Dar city.

5 Agricultural Production pattern

Addis Ababa

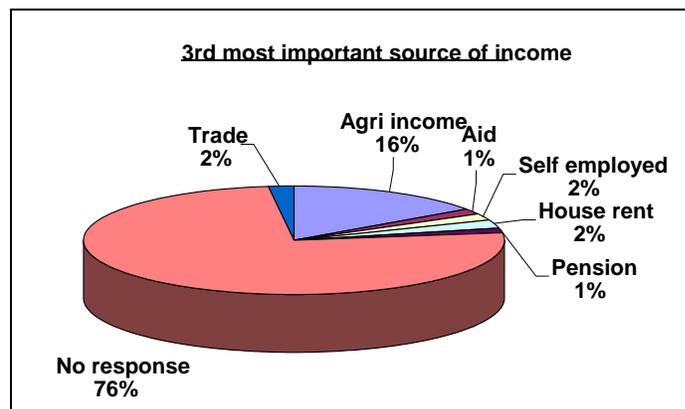
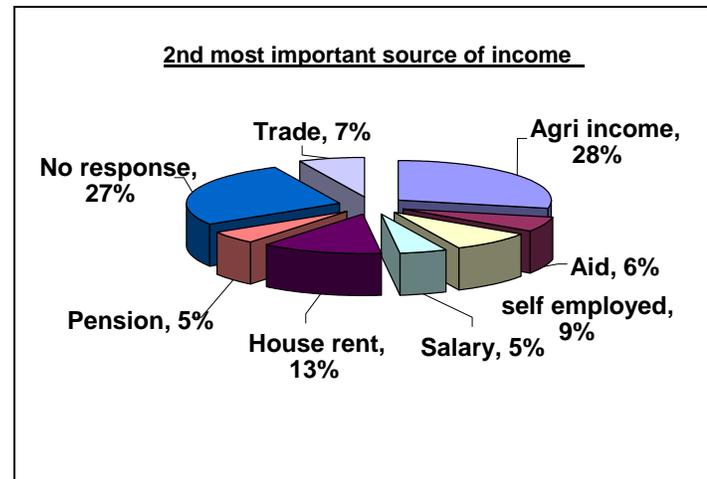
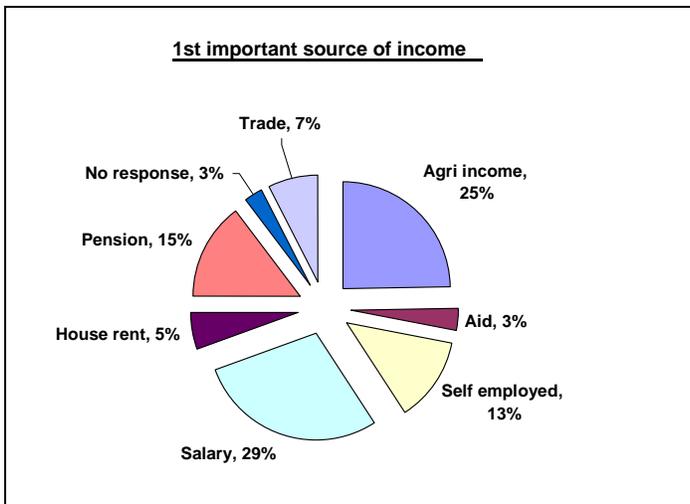
Agriculture in Addis Ababa comprises both peri-urban and intra-urban type. The peri-urban producers are organized in peasant associations and they are mainly engaged in mixed farming like the other rural parts of the country, where crop production is dominated by field crops like teff, wheat, maize, barley chickpea, faba bean, lentil etc. These types of farmers comprise about 4100 farm households working on about 10,487 hectares of land. The other type of agriculture is the intra-urban agriculture, which could be segmented into different groups depending on the purpose and type of products. In the intra-urban area agriculture is predominated by perishable and relative high value enterprises like vegetables, dairy and poultry production. This study focuses on such type of farming as this typically manifests the nature of urban agriculture.

Agriculture in the city is not something new to the society as the development path of the country is from agriculture to non-agriculture and the cities are usually engulfed by farming communities.. Thus although it is affected by the age of the households, about 8% of them started agriculture before 15 years, 23% started within the last 6-15 years and 54% started in the last 5 years. This indicates that there is a changing trend that young community members are making agriculture a business and job opportunity than looking for government employment, which was a common trend in the past.

About 64% of the sampled agricultural households undertake their agricultural activities in their own living compounds; some of them, about 4% use open unallocated kebele lands and about 7% use land, which is allocated for agriculture. There are also some households (2%), who undertake agricultural activities on waste disposal sites. Considering the income sources for the sampled households in Addis Ababa, 25% of the households consider agriculture to be the first major source of income followed by salaries (29%) of different type. Moreover, 28% and 16% of the households consider agriculture to be the second and third important source of income, respectively, showing how agriculture is important in the livelihood of the majority households in the city.

Table 1 : Responses of respondents on the sources of agricultural land in Addis Ababa

Description	Percent
No response	21.1
In living compound	64.2
In living compound and agriculturally allocated land	0.5
In living compound and kebele offered land for groups	0.5
Kebele lands	3.9
Land allocated for agriculture	7.4
Waste disposal site	2.0
Kebele land given to groups	0.5
Total	100.0



5.1 Vegetable Production

Unlike the animal husbandry, vegetable production is highly correlated with availability of open land and water source. Vegetable is an important enterprise in which many households drive their livelihoods. The major vegetable production is concentrated in the riverbanks and some of the waste disposal sites. In Addis Ababa currently there are 11 vegetable producers' cooperatives with a total membership of 957 of which 321 are female and 636 male members. These cooperatives embrace 7450 family members. They cultivate about 394 hectares of land and most of them produce vegetables twice a year in dry season. The producer cooperatives are located in Akaki Kaliti, Nefas Silk Lafto, Kirkos, Kolfe Keranyo and Yeka subcities. The important sub-cities where vegetables are produced are Akaki Kaliti, Nifas Silk-Lafto, Bole, Kolfe Keranyo, Yeka and Kirkos in that order of importance. Vegetables are also grown in Addis Ketema, Arada, Lideta and Gulale subcities. Besides the cooperatives, there are also considerable numbers of other small groups as well as individuals who produce vegetable using mainly waste disposal sites. Such groups usually get the land temporarily from the city administration and they usually clean wastes disposal sites and grow vegetables on it. It so happens that after cleaning of the waste land by such group, the value of the land dramatically increases for different uses and the use of the land for construction becomes important. This indicates, such groups do not have long-term security. Recently to avoid the problem of displacement because of the expansion of the city, many of the cooperatives are trying to secure their land by having the ownership certificate from the Addis Ababa city administration. The other group of producers is home garden vegetable producers who produce some vegetables in their own leaving compound. This group mainly produces for home consumption and what it supplies to the market is very insignificant.

In the sample, nearly 35% of the households participate on vegetable production and 25% only produce vegetable and the remaining 10% practice in either crop or livestock or both with vegetable. Most farmers (65%) who engaged on vegetable production use irrigation while the remaining 35% are depending upon rain water. Those who use irrigation do not produce during rainy season mainly because of destructive flooding that they usually encounter in the riverbanks. The three most common irrigation methods are hand watering (41%), furrow irrigation (27%) and drip irrigation (25%). The majority of the farmers (49%) use tap water for irrigation and 21% uses river. Small proportion, 10% and 6%, respectively uses ponds and wells. Many of those who are using irrigation (76%) pointed out that there is shortage of water to irrigate their vegetables.

Vegetable production in Addis Ababa using other sources of water other than tap water for irrigation is becoming risky as there is health hazard because of the disposal of waste to the rivers from the different factories and residence houses. There are factories that dispose the waste without taking into consideration its effect on health. On the other hand there are other factories that are trying to avoid such immoral activities. However, the level of the effect is not clearly documented. Nevertheless, it has affected the market of the producer at one time and consumers are suspicious of consuming vegetable produced in Addis Ababa.

5.2 Livestock

Animal husbandry is a common agricultural activity undertaken in the Addis Ababa. Dairy, poultry, shoat and equine raising are among the most common types of husbandry in the city. This fact is substantiated by the high proportion (72%) of the sampled households who practice animal production in one or the other way. About half of them have at least one cow indicating the dominancy of dairy in animal production. It is followed by poultry, as 30% of the households who manage livestock raise chicken. The other livestock keeping activities like cattle, sheep and goat fattening, and apiculture are not very common in Addis Ababa, though some farmers practice it.

5.2.1 Dairy

Dairy farm is an important component of urban agriculture as a main stay for many agricultural households in Addis Ababa. Some urban framers too grow grasses for their cows and for sell too. Among the interviewed households in Addis Ababa, dairy cows holding range from one to twenty-one. According to some recent study more than 30% of the dairy owners are women and about 93% of the dairy owners keep 1-5 cows. The results of the current study do also confirm this fact as 90% of the sampled households have 1-5 cows. The wealthy group usually starts to keep more number of dairy cows; however because of the high difficulty of the activity they usually drop it out. People manage cows within very small area. Most of the breeds in Addis Ababa are cross breeds that have more of exotic blood levels which need intensive management; but most of the owners do not provide intensive management which in turn substantially affects milk yield.

Previous information indicates, many of the urban farmers depend on sale of milk and it is estimated that about 60% of the milk produced in the city goes to the informal market. This survey also confirm that 61% of the households keep dairy cows for commercial purpose and 27% keep both for home consumption and supplementary income while only the remaining 12% keep for home consumption. This shows that majority of the dairy farmers under consideration are market oriented and keep cows for means of income generation. Farmers sell milk to the city dwellers and to Mama Milk processing industry. However there is price fluctuation that may have implication on dairy business. During the long time fasting period, the price of the milk falls down mainly because many people fast during that period and as a result the demand for milk decreases. On the contrary, at this particular time the feed price shoot up because many households start to keep a number of sheep and cattle for fattening. The animals are usually sold during holidays. This definitely affects the performance of dairy both in terms of high cost of feed and low price of milk.

One of the major problems of dairy farm in the context of urban agriculture is waste disposal. The cows are managed within the living compounds although all the households do not manage the waste properly to avoid any sanitation related risk within the community. As a result, in some cases there is conflict within the community. If such conflict prevails, usually the owner is forced to stop the business. Cow dung is usually used as a fuel wood and its impact may not be much pronounced. On the other hand the urine needs to be disposed well to avoid the odder and different households do have different way to manage that. Some households prepare pit, some connect to the swage system, some let it into the near by river and others let to the pathways and roads. As a result its effect varies and in some case there is no indication that there are cows in the compound showing the potential to avoid the odder that may have negative consequence of dairy management in the city. In this case some of the dairy cow holders and those who keep cattle either for production or fattening usually dig pit in their compound and collect the urine. When there is heavy rain they add to runoff so that it will be taken to the common ditches. They collect the dung and prepare pancake and use for fire as energy source. Some people buy to use it as farmyard manure for their vegetable farms.

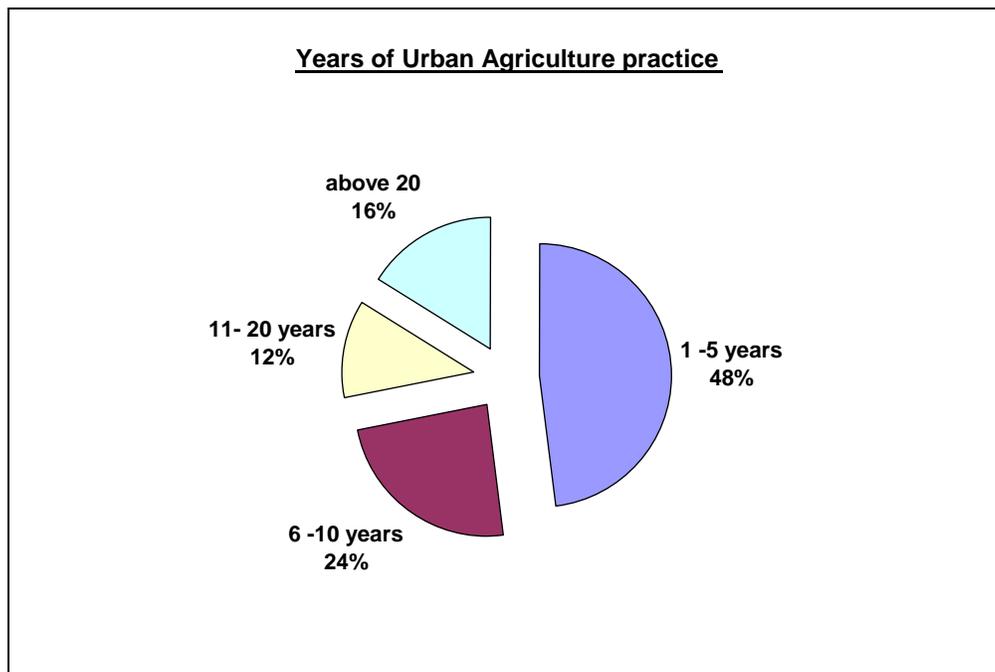
5.2.2 Poultry

Poultry is among the few agricultural enterprises that could best fit not only to the city, but also to the small scale possible. Next to dairy farming, poultry keeping is the second most important component

of animal production in the city. Different households keep poultry both for commercial, supplementary income and home consumption.. Poultry keeping needs high care and more attention. The enterprise is profitable as the demand for eggs and chicken meat is very high in the cities. The attention given to this sector is relatively better. Many households manage poultry that range from few layers to commercial size. About 30% of the households who are participating in animal production manage poultry. Among the entire poultry raisers, those who had one to five heads accounted for 50%, those who keep six to ten and above ten accounts for 39% and 11% respectively. Generally majority of the households keep small number of poultry. The smaller the size of the flocks the more it is for home consumption and the more the flocks size the more it is used for commercial purpose. Thus majority, 52%, of the sampled households are managing poultry to use their product (egg and meat) for home consumption, while 29% are keeping entirely for marketing purpose and the rest 19% for both, home consumption and marketing. In general the sample survey result suggests that poultry production in the city is in a small scale level and mainly for household use purposes. Poultry is relatively risky business particularly the exotic breeds, some of those who started keeping poultry as commercial enterprise usually discontinue the business and poultry is dominated by small scale.

6 Production Pattern - Bahir Dar

Looking to the age of urban agriculture in Bahir Dar, the greater part (48%) of the sampled interviewees has embarked on urban agriculture within the last five years. Urban agriculture practitioners who have started urban agriculture 6 to10 years are close to 24 %.



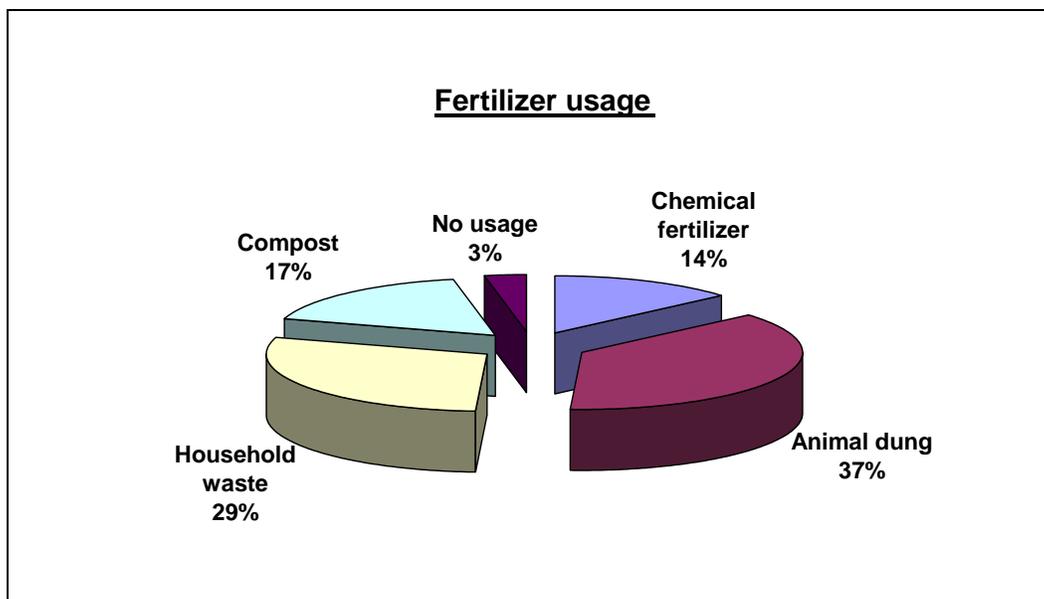
In general the above illustrated result portrays that the urban agriculture practice in Bahir Dar is characterized by frequent shift since the majority have initiated their job very nearly. However, it should be recognized that the urban agriculture practices in the city has exhibited a longer period of time despite frequent entries and exits in and from the sector.

6.1 Crop

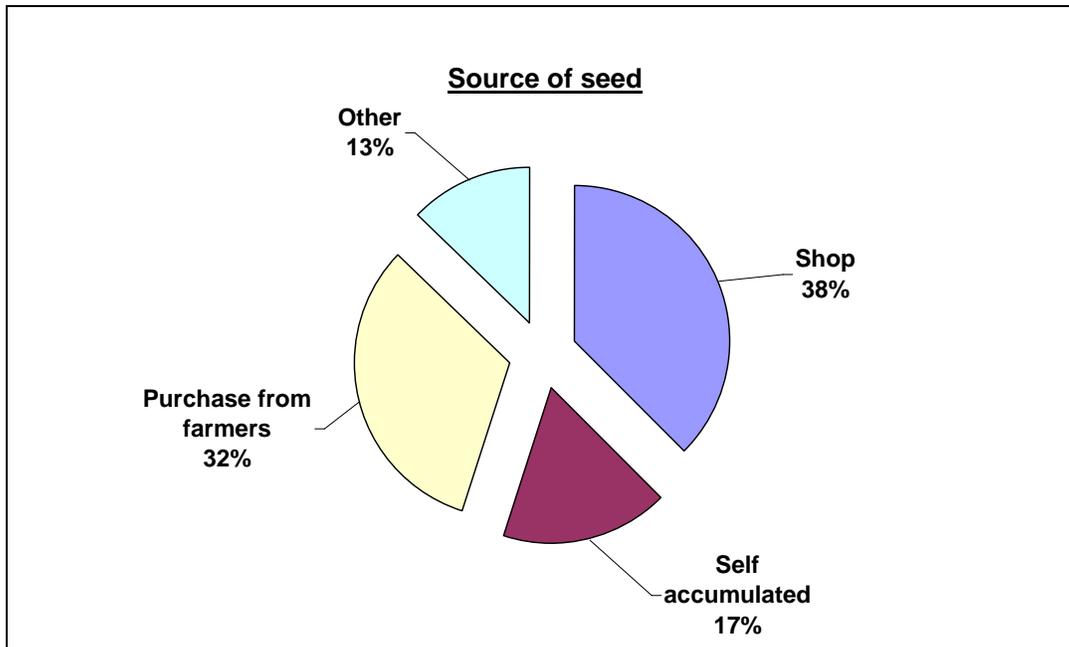
Unlike animal production, vegetable and cereal production is highly correlated with availability of land, water source and location of the plot. It has been depicted that in one way or the other 46 % of the sampled households have been engaged in horticultural/cereal production alone or in combination with other type of urban agricultural activities.

Among the sampled households who have been enrolled in vegetable production, it was revealed that the most important types of vegetables grown are Swiss chard, cabbage, tomato, and lettuce. Among cereals maize, millet and, barley were found the most commonly cultivated crops in their order of importance. Similarly, mango and avocado among fruits as well as *chatt* and coffee among cash crops were found the leading.

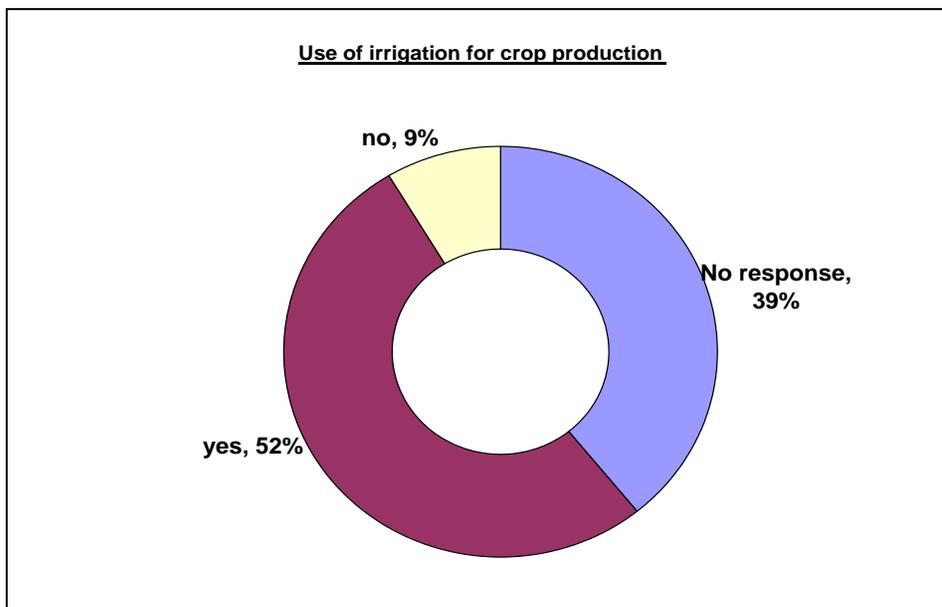
Most of the vegetable growers use animal dung and apply compost to their farm as fertilizer sources for growing their vegetables.



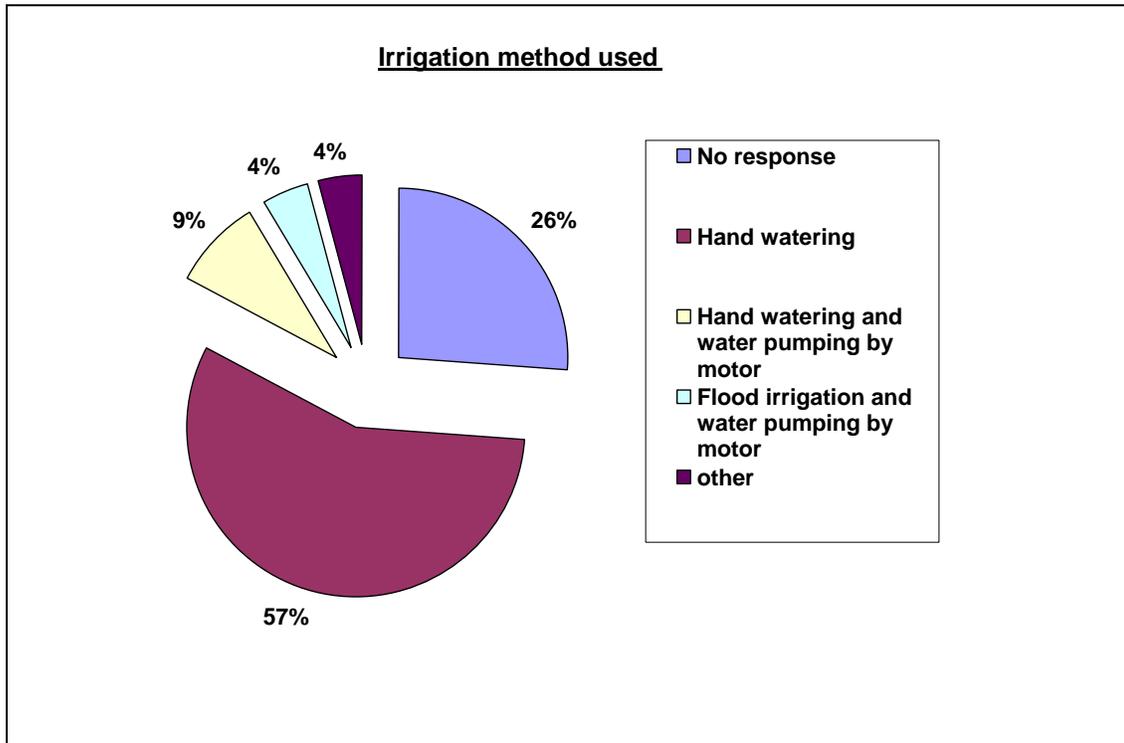
Regarding seed source, most of the cereal and horticultural crop producers purchase seed from shops and individual farmers.



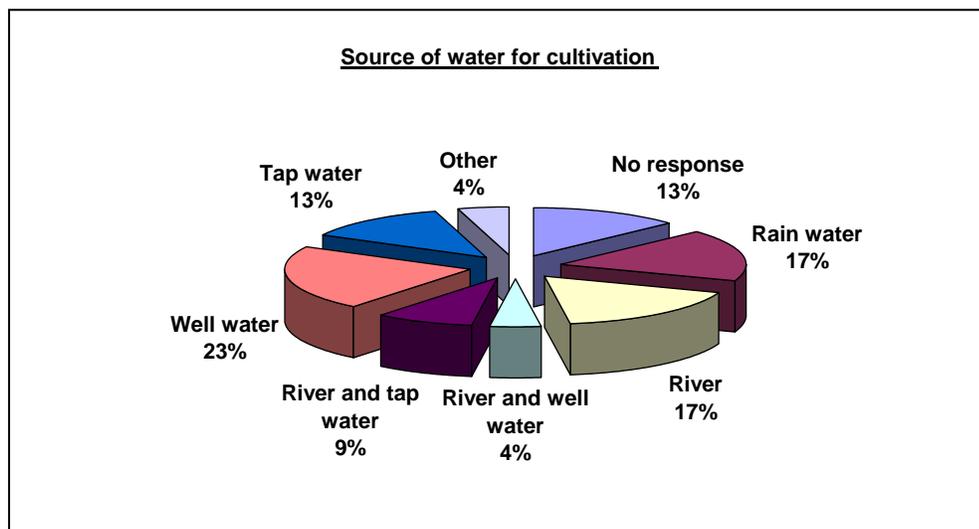
Of the entire horticulture and cereal producers 52 % of them use irrigation to grow their vegetables, where as about 9 % do not use irrigation.



Among the different kinds of irrigation types, the majority of them (57 %) use hand-watering techniques.



Good proportion of crop producers (23 %) use well water, followed by river water users (17 %), rainwater users (17 %) and about 13 % use tap water.

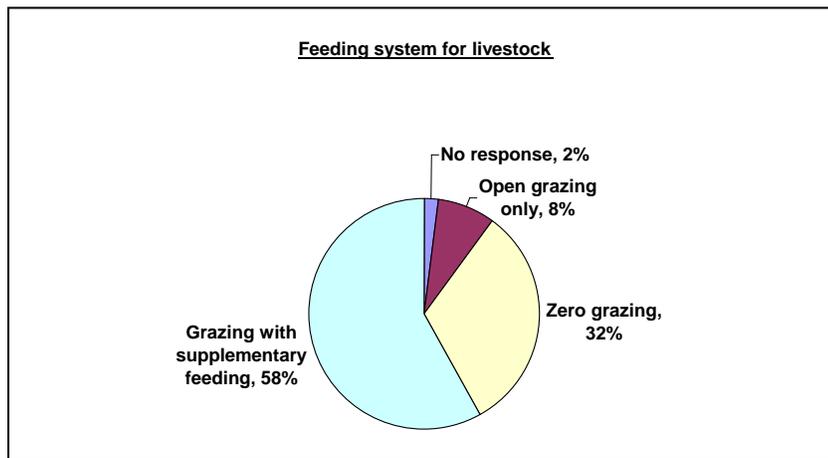


In general, the sample survey has uncovered that the majority produce vegetables mainly on smaller plots via using hand watering techniques and using well water as a source of water for irrigation.

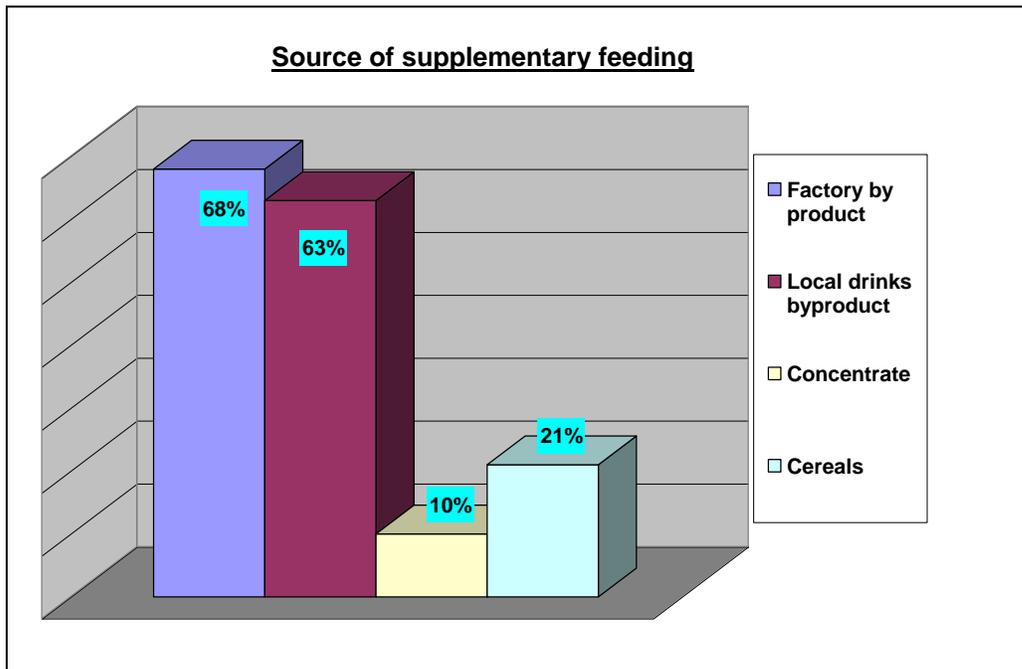
6.2 Animal husbandry

In Bahir Dar, the most common type of animal husbandry is raising cattle, particularly dairy cows, sheep & goat fattening/rearing and poultry keeping. Previously, it was stated that in one way or the other 76 % of the sampled households are engaged in animal husbandry practices. Almost all practitioners keep one to five animals per household. Nearly all use the animals' output both for household consumption and as a source of income.

Regarding feeding system for livestock, the majority (58 %) uses grazing and supplementary feeding. Factory by product is the leading source of supplementary feed either in combination with other type of feeds or alone.



Concerning the problems associated with dairy farming, the households under consideration have described lack of space as a first major problem, shortage and high cost of feed as second and third major problems.



7 Supports and services

7.1 Addis Ababa

The agriculture extension services section of Addis Ababa urban agriculture believe there is ample potential to grow vegetable mainly for home consumption within the limited living compounds. Households are encouraged to produce fresh vegetables and consume. When space is limiting, different containers with different arrangements could be used to produce vegetables in the living compounds. In the process households could also make use of the household waste as fertilizers which otherwise is damped and create environmental pollution. Vegetable producers usually get inputs (seeds and farm tools) from the markets and technical advises are given from the agricultural extension service. Since these farmers were in the business for long time they know which variety they have to buy and the chemical they may have to use and they rarely come to get the extension service. On the other hand, the newly starting farmers consult the extension service on some technical issues.

In order to justify this authenticity, the sample households were asked whether they had an experience of receiving extension services and other support from any organization and particularly from the city's urban agriculture department. Consequently the majority (81%) have claimed that they have never been addressed by any kind of agricultural extension services and related supports from any organization.

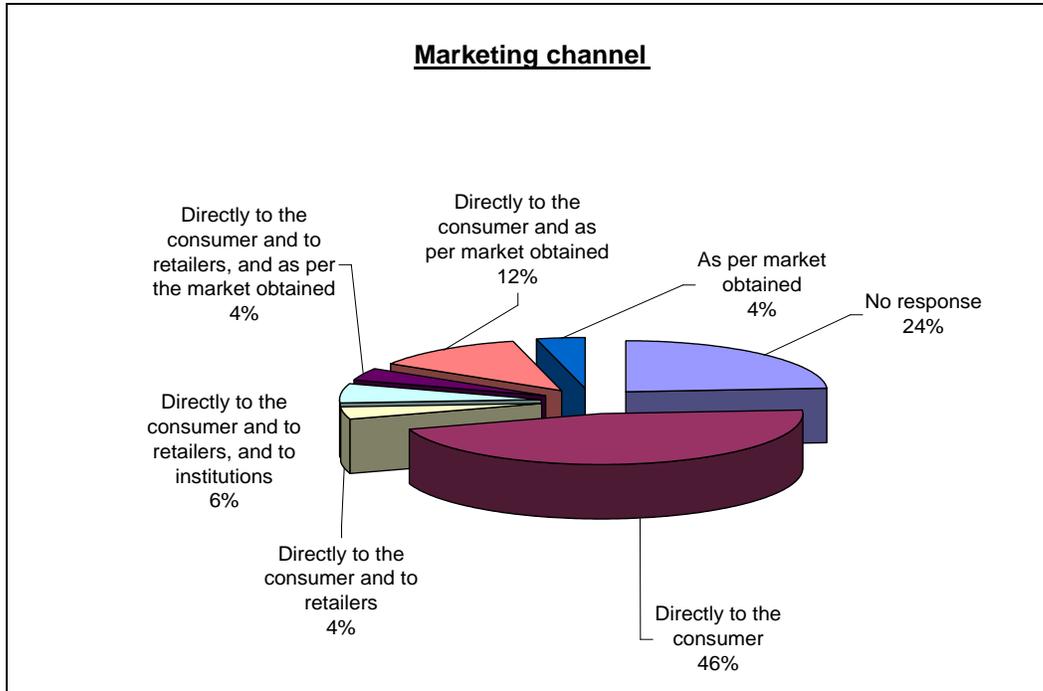
There are some technical and material supports such as motor pumps, seeds, fertilizers, and farm tools for some organized vegetable producers' cooperatives. In case of poultry, there is support in terms of supplying three months old-chick. The chicks are provided in the ratio of 1:5 cocks to pullets by the Addis Ababa Urban Agriculture Department. There is high demand for egg and chicken meat in general.. Currently the Addis Ababa urban agriculture has poultry multiplication center with a hatching capacity of 1400 chicks per day.. There is a plan to improve the capacity of the center to carry 108,000 day-old chicken, 19,000 layers and 330,000 hatchable eggs. The reason of improving the capacity of the center is, there is high demand and potential for poultry in Addis Ababa. So far the source of the chicken distribution is not only limited to the government distributing center, but households get from different sources including Genesis Farm. At any scale the major focus of the chicken raising, is for cash income than consumption.

7.2 Bahir Dar

Extension services and other technical supports are very much restricted in the urban agriculture sub-sector of the city. In order to justify this authenticity, the sampled households have been inquired whether they had an experience of receiving extension services and other packages of support from any organization and particularly from the city's agriculture department. The majority have (70%) acclaimed that they have never been granted any kind of agricultural extension service and related supports from any organization. Some 18 % have said that they have an experience of getting supports from the agriculture office of the city.

The sampled interviewees were also asked whether they have ever observed people using household wastes as compost or fertilizer for urban agriculture (horticultural) productions. Consequently, 86 % of the entirely sampled households have affirmed that they have witnessed usage of compost utilization. On top of that, the majority of the beneficiaries confirmed that using household wastes for urban agriculture have environmentally positive impact as it helps in cleaning the surrounding environment. Similarly, opinion tests were conducted on how the sampled households perceive growth trend of urban agriculture through time (comparing the past with the present). Consequently the greater majority (66%) have said that it is exhibiting an increasing trend.

Of the entire urban farmers who transact their outputs, the majority directly sell their outputs to the consumers. Others provide either to the retailers, institutions, or transact as per the market demand..



8 The role of Agriculture in Urban waste management

Leaving in clean environment is becoming more and more important with socio-economic development of societies. Given high population in the urban center the generation of waste also increases and cleaning the waste is becoming very costly. Under any circumstances agriculture is not expected to take up all the generated waste but could contribute to reduce the amount. The recent development is the increasing trend of using household waste for vegetable production in the cities. To confirm this trend the sampled interviewees were asked whether they have observed people using household wastes as compost or fertilizer for crop (horticultural) productions in urban areas. Consequently, 43% of the respondents confirmed that they have witnessed the use of waste for horticultural production and about 45% responded that they have not. Thus the use of waste as fertilizer is becoming common. Moreover, majority of the interviewees witnessed that the practice of household wastes for urban agriculture use, have environmental significance from the point view of reducing the size of the household wastes and cleaning the surrounding environment.

9 Major Findings

9.1 Addis Ababa

Various agricultural operations are undertaken in the intra-urban and sub-urban areas of Addis Ababa city. The sector plays an important role in the city's economic structure in respect to the supply of agricultural products, income distribution, job opportunity creation, and other economic variables. The city has its own agriculture system and mainly includes livestock raising, vegetable and grains production, forest development and to some extent apiculture.

Livestock keeping is a common phenomenon and it is part of the urban agriculture activity in Addis Ababa city. Urban and peri-urban dairy production systems are among the many forms of dairy production systems that are involved in the production, processing and marketing of milk and milk products. Livestock keeping in the city has special problems and opportunities indeed. Among the problems is the waste disposal system and the opportunities are the market for its products. The animal production in the intra-urban of the city is dependent on crop residue produced in the peri-urban for the feed.

The purpose of keeping livestock varies from the subsistence to pure commercial. The intensity of management and type of animals kept likewise also vary. The pure subsistence farmers usually keep local breeds having low productivity, primarily because the low management requirement of the animals. On the other hand the commercial groups keep those breeds which have higher exotic blood, that have higher productivity, which requires intensive feeding, housing and medication services. The same holds true for poultry as the subsistent households depend on scavenging local birds while the commercial household group depend on the high productive exotic breeds.

One of the important government institutions involved in rendering different services to urban farming community is the Addis Ababa Urban agriculture Department. Presently it is accountable to the Ministry of Trade and Industry. The Department is comprised of three teams and two centers:

(1) Livestock and livestock products market development team (2) Veterinary and quarantine service team (3) Agriculture and extension service team (4) Poultry multiplication center, and (5) Veterinary clinic laboratory center. The main objective of the department is to render various technical services to

increase agricultural production & productivity and extend improved agricultural techniques in the city.

The most important problems of the city are poverty and lack of job opportunities that is associated with poverty. The urban agriculture sector is playing and can continue to play an important role to partially alleviate poverty in the city. Based on some information of various countries, about 30 % of the food supply in the cities is covered from the production of the urban farmers. However in Addis Ababa there are limited supplies on livestock products. The information about the urban agriculture section is very limited and as it is not well documented indicating that there is a lot to be done on this aspect.

Addis Ababa city has long been the main center of the Ethiopia's industrialization and commerce. It is estimated that the total population engaged in intra-urban agriculture is about 69,518. The current development strategy the country has adopted i.e. agricultural development led industrialization (ADLI), in principle, should not shift the central national role of the city. The assumption is that ADLI would raise the purchasing power of the rural population and with this an increased demand for urban goods and services. However, the success of this strategy greatly depends on increased availability of jobs in the cities, as increased rural incomes may well lead to more migration to large cities, as people search for better educational opportunities and social status.

In the urban settings, agricultural land use pattern is not as such well designed. In addition different land use problems are also common in the cities due to sanitation and environmental pollution, incompatibility, land utilization, zoning, regulations, deforestation etc.

In Addis Ababa there are 5000 dairy farms at present. They are categorized/classified into three main classes based on the number cows owned by the household. . Those with 1-5 dairy cows are categorized as small-scale producers; 6-10 dairy cows as medium scale producers and those owning more than 10 cows are considered as high scale producers. Apiculture is practiced formally and informally in some areas in a very small scale; however it is not significant. In the sub-cities there are some organizations giving technical and others agricultural extension services. They work in close collaboration with the Addis Ababa urban agriculture department.

In the peri-urban areas of the city, mainly cereals are produced while in the intra-urban areas leafy vegetables are predominantly produced. The total area of land under urban agriculture is 10,487 hectare. Nearly 400 hectares of land is under vegetable production either by individuals and cooperatives. There are 11 vegetable producer cooperatives who are actively engaged in vegetable productions and these cooperatives cultivate about 270 hectares of land.

The total population size of the farming households in Addis Ababa city is estimated to be 148,575, out of which 79,056 are in the peri-urban and 69,518 in the intra-urban. The total number of householders that are involved in different types of farm- activities are estimated to be about 17,775. Out of these about 9.8 % are in crop producers, 10.3 % livestock raisers and 79.9 % are engaged in both crop and livestock production(CSA, 2003). On the other hand, in the urban areas of Addis Ababa city, the type of land use indicates that 15.4 percent are crop growing holders while the remaining 84.6 percent are practicing both crop and livestock production (CSA, 2003). The city has 53,915 hectares of land of which 24 % is occupied by residential uses, 7 % by government institutions and urban services, 6 % by light and heavy industries and 62 % by agricultural land, forestry and other spaces (AA-EPB, 1997).

The attention given to research and extension in urban center is so limited leading still to the demand of more land for less intensive type of crop production. Recently some initiatives are proposed to introduce the possibility of producing some vegetables on small plots, growing bags etc in the urban centers that may need to be strengthened further to accommodate crop production in cities. The practice looks relevant for those crops with more value per unit area; and under such circumstances, vegetables are the major crops grown in cities. The purposes of producing vegetables are still for multiple interests that includes supplementary food source as well as supplementary income.

9.2 Bahir Dar

In Bahir Dar, urban agricultural activities are practiced in the peri-urban and intra-urban areas of the city. However, its contribution to the economy is still low. Some intra-urban farmers produce vegetables, fruits, coffee and chatt. Some irrigation activities are exercised around Lake Tana and along Abay River and presently land under irrigation is 28.88 hectares. Others keep dairy cows, fatten cattle, sheep, goat, raise poultry; engaged in apiculture and run fishery activities. There is an enormous

opportunity in Lake Tana for fish production. There are two cooperatives on fishing activity with 6-22 members each and there is one milk-supplying cooperative with 106 total members (92 males and 14 females). These cooperatives maintain a total number of 5,155 dairy cows comprised of 4306 local breeds, 754 cross breeds and 95 exotic breeds. There are also 5 registered individuals who are fattening beef animals in the city. Each of them maintains 10-60 cattle on average. The livestock population recorded in the city is 4801 cattle, 2,277 sheep, 528 goats, 28,363 poultry and 248 beehives. The average lactation period for both types of breeds is close to 8 months. The total milk production in the city is estimated to be 1,389,931 liters per annum. The share of intensive dairy farmers in the total milk production is almost negligible in Bahir Dar case. The milk usage proportion is shared within home consumption (55.29 %), sales (31.92 %) and others (11.96 %). Viewing agricultural activities from employment generation side in the city, 99 % are self-employed and only the remaining 1 % employed others.

The Bahir Dar Urban agriculture office is one of the government institutions recently opened to render services for the urban farmers in the metropolis. The department is accountable to the regional Trade and Industry Bureau. There are also some important NGOs supporting the community in connection with the urban agricultural activities in the city. These organizations include Bahir Dar Medhanealem Orphans Destitute Family Support and Training Center, Jerusalem Children and community Development Organization (JeCCDO), ECIAfrica/DAI. The support is technical as well as material and financial. The principal problems that the urban agriculture sub-sector faces in the city is; availability of land, collateral for credit services, lack of Artificial Insemination services, poor management systems (i.e. traditional), shortage of technical assistance and training and shortness of land leasing period for agricultural purposes, and high land lease rate.

10 Major challenges

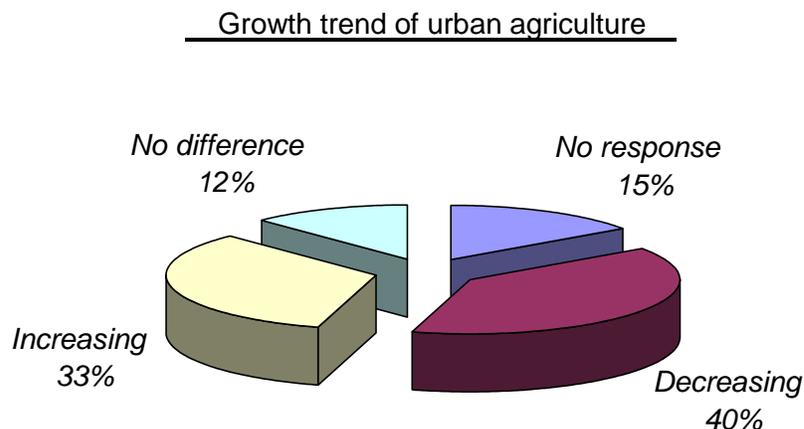
In relation to the urban agriculture practice, numerous problems have been encountered among the producers. The enumerated households have explicitly pointed out a wide spectrum of problems during their activities. The problems range from simple shortage of input like feed up to the policy maker perceptions. In countries like Ethiopia, where poverty is at acute stage, the overall policy direction and the commitment of the government are very important for development. Hence, the important challenges are:

- Lack of awareness on the importance of the sector in the economy,
- Poor policy support
- Poor support of the extension services
- Lack of provision of working place
- Lack of credit services
- No clear policy and regulations on urban agriculture
- Potential health hazard of vegetable productions when using contaminated water for irrigation

11 Prospects of urban agriculture

Producers usually need to have secured land ownership for urban agriculture activities. The farmers also need better extension services and aspire for the expansion of the activity as it is supporting their livelihoods. In addition to on spot produced food supply and income out of the surplus, Urban agriculture has the role of creating job opportunities as it employs family labour. It also helps in recycling household wastes/solid waste as it is used as organic fertilizer. However, the enterprise requires relatively better technical knowledge and better management skill.

To generate information on prospect of agriculture, opinion test was conducted on how the sampled households perceive the growth trend of urban agriculture through time (comparing the past with the present). Results showed that the greater majorities (40%) have said that it is exhibiting a decreasing trend. Still considerable proportion (33%) said that it is increasing. These views could be seen from different angles. If we see in terms of the land under crop production, it is showing a decreasing trend. On the other hand there are many young groups starting agriculture recently with probably commercial mind. In this case respondents may assume an increasing trend. Unfortunately time series data is lacking to confirm the view.



12 Summary

This paper has seen and assessed the features of urban agriculture in different context of the globe as well as Ethiopia focusing in Addis Ababa and Bahir Dar cities. Accordingly issues pertaining to local as well as global experiences of urban agriculture, challenges encountered and opportunities forgone have also been explicated as detail as possible in this paper.

The prime objective of the paper encircles around assessing land use pattern for an assortment of agricultural activities, paving a way for opportunistic situations of exploiting communal vacant land, and if exists, the associated constraints along with. To this end, the study has tried to address the issues raised above via highlighting the opportunities available and spotting the opportunities. Other objectives such as assessing the potentials and prospects of urban agriculture in general, assessing environmental impacts to build clean neighborhood and identification of intervention areas and role of stakeholders for healthy development of the sub sector has also been addressed by this paper.

The actual potential of urban agriculture in the areas under consideration (i.e. Addis Ababa & Bahir Dar), have ideal climates, ample water sources, and exploitable unused land resources to undertake urban agriculture. On the other hand, challenges for urban agriculture range from such as shortage of adequate services and land to a discouraging policy environment towards the sub-sector. Besides, poor awareness and low institutional capacity could be cited as other maniacs.

The present land use pattern in relation to urban agriculture mainly includes livestock raising presumably dairy farm and vegetables production in the intra-urban, where as in the peri-urban areas dominantly grain crop production and forest development are practiced. However, in the urban settings the agricultural land use pattern is not as such well designed. The urban agriculture sector plays a vital role in the city's socio-economic structure with respect to the supply of additional agricultural products, in job creating opportunities, income distribution, wasteland utilization, sanitation and other economic variables. In addition to different land use pattern and important roles, the sector has also its own common problems in the cities due to sanitation and environmental pollution, incompatibility, land utilization, regulations, deforestation etc.

The attention given to research and extension services in urban center is so limited leading still to the demand of more land for crop production. Most people, particularly women, are job insecure or work

in the informal sector. Survival strategies of the urban poor are not being conveniently addressed by international development agencies. In the sector organizations capable of creating sustainable opportunities for business and reliable income generation schemes are rare.

13 Conclusions

Urban Agriculture is practiced in intra-urban or in the outskirts (peri-urban) of a town or a city. The sector needs to be strengthened with possible means of sustainable development of the cities thereby securing food, safe environment and harmonious society. It is a fabulous importance that the future urban agriculture that should be promoted should aim at higher productivity, profitability, conservation of natural resources, protection of the environment, which enhances safety and health of the people being a typical character of sustainable agriculture. Moreover, matching the physical resources potential with the appropriate cropping and animal husbandry practices through defining land use plan, complementary use of resources and introducing organic farming methods would have a paramount importance to bring about sustainable agricultural practices in Addis Ababa and Bahir Dar surrounds.

The coordination and integration of the relevant institutions will highly facilitate to effectively address issues of the urban agricultural practices. Consequently, dedicated resource mobilization in terms of finance, technical, manpower, and material among the concerned institutions eases the rapid transformation of the sub-sector so that adequate agricultural supply is ensured and productivity improved in the areas under consideration. The active involvement of different parties has a magnificent role in augmenting the sub sector. Currently there are some NGOs who are playing important roles in supporting the urban agriculture sector in the city, such as *ECIAfrica* supported local NGOs including WeSMCO, Bio Economy Association, ISAPSO, HAPCSO, Emmanuel Development Association and PICDO in Addis Ababa and Dawn of Hope, Mekdim and Medhanealem Orphans and Destitute families Support and training center in Bahir Dar are doing marvelous job in promoting agriculture in urban settings. Other local NGOs such as ENDA/Ethiopia and Jerusalem Children development Organization are also doing on urban agriculture. To proceed currently the *ECIAfrica* initiative is playing a remarkable role in Addis Ababa and Bahir Dar, particularly via devising mechanisms such as low cost, and intensive urban gardening systems. The program is mainly targeting to support low-income urban women and their households, who are

affected by HIV/Aids so that they could sustain themselves by conducting urban agricultural practices. This effort of course should be strongly backed by other concerned stakeholders such as the government, the community at large and concerned international/local NGOs who have similar goals towards improving the society's welfare.

In addition to this, the sector has to be fully supported by the respected municipalities. Modern agriculture do not emerge from nothing, but from the existing small scale subsistence agriculture located in different parts of the country and policy makers need to know that in the long run all rural area will be part of urban and food production will continue in the urban center. Important institutions like Ministry of Agriculture, research and extension organizations environment protection agencies etc usually lack a political mandate for promotion of urban agriculture. Moreover, the Addis Ababa urban agriculture office, which was actively involved in the urban agriculture activities, has been scaled down to a department level under the ministry of Trade and Industry. Consequently, due to the scaling down of the level, the budget allocated to the office is thus limited. Earlier it was an independent bureau under the ministry of Agriculture with more budgets, manpower and more services. In addition to this most of the urban agriculture projects are rarely integrated in overall urban planning. Generally there is little co-ordination and poor communications among municipal agencies, other responsible institutions, NGOs, urban farmers and other concerned bodies. Hence, all the stakeholders in urban agriculture should get channels to voice their needs with an integrated approach.

14 Recommendations / Interventions

Important suggestions for the development of the urban agriculture:

- Integration of agriculture in urban planning policies
- Promotion of participatory management for urban agriculture (involvement in discussing between social actors and municipal administration, planners etc)
- Support and facilitate in designing and implementing of Urban Agriculture
- Building local capacity in municipal management planning to facilitate urban agriculture
- Establishing a database on urban agriculture
- Proper land use management and physical planning (measure the value of vacant places, including of urban agriculture as a multifunctional component in municipal land planning and standard development process concerning land use and environmental protection)
- Provision of secured polices and incentives for urban farmers
- Clear taxation rules and facilitating legal frame works
- Develop strategies to reduce environmental impacts and the depletion of natural resources by establishing the ecological track of different life styles, infrastructure, consumptions pattern and certain densities separately
- Expansion of micro credit and investment programs for urban farmers
- Implementing credit and financing policies and instruments for the poorer and most vulnerable groups by the local governments
- Funding programs should aim in strengthening social organizations, technical assistance, training and marketing support, human capacity building,
- Develop appropriate and adaptable technologies for urban agriculture and suitable research methodologies, such as container gardening, drip irrigation, mushroom production which relatively needs smaller space.
- Apply compatible conditions with technical and productive nature of urban agriculture
- Recycling of the organic wastes and wastewater
(Organic waste in the cities is 30-60 %, which can be used for urban agriculture)
- Educating the communities in reusing wastes
- Processing and marketing urban agriculture products (added value)
- Public policy on urban agriculture should provide for access to capital, inputs, and marketing strategies for the poorer sectors,

- Promote standards to regulate small business initiatives, support promotion strategies and increase producer organizations' representation in government bodies,
- Design interventions to address the needs of particular disadvantaged groups for promoting gender equity, disabled, affected groups, etc.
- Promoting urban agriculture as a family farming

To sum up, the future urban agriculture that would be undertaken in the city should be intensive type, that doesn't require much land (that doesn't compete with scarce urban land), user of better (improved) farm inputs, aimed at producing higher output per unit of area, and that conserves natural resource and protects ecological degradation.

15 Literature cited

- Addis Ababa City Administration, Environmental Protection Bureau (AA-EPB), 1997. Regional Conservation Strategy secretariat. The Resource Base, its Utilization and Identification of Major Issues and Constraints, volume I.
- Bakker et al., Growing cities, Growing food: urban agriculture on the policy agenda, DSE, Germany, 2000.
- CSA, 1994. Population and housing census of Ethiopia.
- CSA, 2003. FDRE, Ethiopian Agricultural Sample Enumeration, 2001/02. Results for Addis Ababa City Administration.
- Egziabher A.G, Lee-Smith D, Maxwell DG, Memon PA, Mougeot LJA, Sawio C. 1994. Cities feeding people: an examination of urban agriculture in East Africa. Ottawa: IDRC.
- Eyassu Kumera, 2000. Urban Agriculture in Addis Ababa. Office for the revision of the Addis Ababa Master plan (ORAAMP).
- House W, Ikiara G & McCormick D. 1993. Urban self-employment in Kenya: panacea or viable strategy? *World Development* 21 (7): 1205-1223.
- IFPRI. 1999. "Are Urban Poverty and Under-nutrition Growing? Some Newly Assembled Evidence," Food Consumption and Nutrition Division, Washington, DC.
- Mbaye A & Moustier P. 2000. Market-oriented urban agricultural production in Dakar.
- Mougeot LJA. 1994. Urban food production: evolution, official support and significance. *Cities Feeding People Report 8*. Ottawa: IDRC.
- Office for the Revision of Addis Ababa Master Plan (ORAAMP): Landuse and city structure studies of Addis Ababa core and metropolitan area, executive summary report, 1999.
- Potutan G, Schnitzler WH, Arnado J, Janubas L & Holmer R. 2000. Urban agriculture in Cayagan de Oro: a favourable response of city government and NGOs.
- Sawio C. 1998. Managing urban agriculture in Dar es Salaam. *Cities Feeding People Report 20*. Ottawa: IDRC.
- Tevera D. 1996. Urban agriculture in Africa: a comparative analysis of findings from Zimbabwe, Kenya, and Zambia, *African Urban Quarterly* (2/3): 181- 187.
- UNDP, Urban Agriculture: Food, Jobs and Sustainable cities, 1996.

Zewdu Yilma. 1987. Water and nutrient regime of soil under intensive use of land irrigated with city's sewage. Thesis submitted to Agricultural Institute, named after V.V. Dakuchayev, Kaharkov (Ukraine) in partial fulfillment for the award of the degree of Master of Science in Agricultural Chemistry and Soil Science.

16 Annexes

Table 1. Livestock population in Addis Ababa

No.	Livestock mix	Livestock size			Remark
		2002/03	2003/04	2004/05	
1	Cattle	64422	65194	65975	
2	Sheep	22823	22845	22867	
3	Goat	5597	5597	5597	
4	Equine	20000	20000	20000	
5	Poultry	35129	354370	357559	
6	Apiculture			1546	

Source: Addis Ababa Urban Agriculture office

Table 2. Details of farms, production demand and gap in Addis Ababa

No.	Types of animals	Number of farms			Average production per year			Total demand per year			Demand gap		
		1995	1996	1997	Milk (liter s)	Meat (tons)	Egg (tons)	Milk (tons)	Meat (tons)	Egg (tons)	Milk (liter s)	Meat (tons)	Egg (tons)
1	Dairy farm	516	516	516	526,284,00			255,500,000			202,871,600		
2	Poultry farm											3290	2780
3	Fattening												
4	Floriculture	1											
5	Vegetable farm	11	11	11									

Note : 11 vegetable producing associations
 957 Total members
 7450 families
 304 hectares
 125,520 quintals of various vegetables in the year 2004/05

- The dairy and poultry production is not only from Addis Ababa but also include the products entered to the city from the surrounding areas

(Source: Addis Ababa Urban agriculture office)

Table 3 Agro processing industry (API)

No	API type	No. of APIs			Processing capacity			Remark
		1995	1996	1997	1995	1996	1997	
1	Industrial abattoir							
2	Slaughter house	3	3	4	800-1000/day (animals/day)			
3	Meat canning and packing plant				500 kg /day			
4	Wax processing plants							

(Source: Addis Ababa Urban Agriculture office)

Table 4. Veterinary Service

No.	Services centre	No of services center			Service capacity			Remark
		1995	1996	1997	1995	1996	1997	
1	Government managed							
1.1	Vet clinic	4			30-50 animals /day			
1.2	Vet health post	3						
1.3	Vet drug shop							
1.4	Artificial insemination center	6						
1.5	Crash	4						
2	Privately owned							
2.1	Vet. clinic	15						
2.2	Vet. health post							
2.3	Vet drug shop	36						
2.4	A.I. center	1						
2.5	Crash							
3	Others							
3.1	Vet. clinic pet	3	3	3				
3.2	Vet. health post							
3.3	Vet drug shop							
3.4	AI center							
4	Crash							
4	1+2+3							
4.1	Vet clinic							
4.2	Vet health post							
4.3	Vet drug shop							
4.4	Artificial insemination center	7	9	9				
4.5	Crash							

(Source: Addis Ababa Urban Agriculture office)

Tab. 5 Distribution of veterinary service giving centers in Addis Ababa

No	Vet service giving center	Ara da	Addis ketem a	Li de ta	Quir kos	Yek a	Bole	Akai Kali ty	Nifas silk lafto	Kolfe Qeran yo	Gulel e	Tot.
1.1	Vet clinic					1		1	1		1	4
1.2	Vet health post											
1.3	Vet drug shop											
1.4	Artificial insemination center						1	1	1	1	1	5
1.5	Crash											
2	Privately owned											
2.1	Vet. clinic	1		1	4	1	4		4			15
2.2	Vet. health post											
2.3	Vet drug shop	2	26		3	1			1	2	1	36
2.4	A.I. center											3
2.5	Crash											
3	Others											
3.1	Vet. clinic pet											
3.2	Vet. health post											
3.3	Vet drug shop											
3.4	AI center											
4	Crash											
4	1+2+3											
4.1	Vet clinic	1		1	4	2	4	1	5		1	19
4.2	Vet health post	2	26		3	1			1	2	1	36
4.3	Vet drug shop											
4.4	A.I center					1	1	1	1	1	1	9
4.5	Crash											

(Source: Addis Ababa Urban Agriculture office)

Table 7. Estimates of Gross rural income from crop and crop residue in the rural kebeles of Addis Ababa Agriculture development and extension department.

Description	unit (q)	2001/2002			2002/2003			2003/2004			2004/2005		
		Qty (q)	Unit price (ETB)	Total cost (ETB)	qty	Unit cost (ETB)	Total price	qty	Unit price	Total cost	qty	Unit price	Total cost
Teff		48097	220	10581340	43498	240		45673	220		47957	230	
Wheat		57654	190		74372	190		78091	180		81996	200	
Barley		2788	200		1289	170		1353	200		1421	200	
Sorghum		652	200		335	160200		352	200		361	200	
Chickpea		4931	180		4472	180		4696	200		4931	210	
Vetch		3718	180		5088	180		5342	180		5609	200	
Lentils		1878	400		1037	400		1089	400		1143	450	
Beans		1263	250		1180	250		1239	270		1301	270	
Peas		1290	400		933	400		980	400		1029	400	
Noog		84	400		52	400		55	400		58	400	
Lin seed		104	350		40	400		42	400		44	400	
Fenugreek		423	250		483	300		507	320		532	320	
Maize		438	120		416	160		437	150		459	160	
Soya bean		60	200		34	200		36	200		38	270	
Sunflower		60	250		34	300		36	300		38	300	
Total		12344			133263			139926			146917		

(Source: Addis Ababa Urban Agriculture office)

Table 8. Total vegetable production in Addis Ababa for the past four years

No	Description	2001/2002		2002/2003		2003/2004		2004/2005	
		Qty (q)	Unit price per 100 kg (ETB)	Qty (q)	Unit price per 100 kg (ETB)	Qty (q)	Unit price per 100 kg (ETB)	Qty (q)	Unit price per 100 kg (ETB)
1	Potatoes	19480	100	19038	100	21712	120	27140	120
2	Tomatoe	4508	100	4437	100	4658	120	5823	120
3	Carrot	18360	150	18084	100	18988	125	23735	125
4	Onion	1120	150	1103	150	1158	150	1448	150
5	Pepper	345	200	341	225	358	250	448	250
6	Beet root	15186	100	14964	75	14536	80	18170	90
7	cabbage	19542	75	19245	75	20207	80	25259	75
8	Lettuce	6590	100	6447	75	6769	80	8461	80
9	Leek	3200	200	3070	200	3223	200	4029	200
10	Swisschard	14587	200	14370	100	15088	150	18860	150
11	Pumpkin	825	200	2812	200	2952	200	3690	225
12	Phaseolus	411	250	370	200	388	225	485	200
13	Cauliflower	9440	400	4616	400	4846	400	6058	400
14	Kale	4687	150	10984	100	11533	120	14416	125
15	Persely and celary	1330	300	8808	300	9248	310	11560	275
16	Squash (duba)	2840	100	1047	100	1099	100	1374	100
17	Others								
	Total	122451							

(Source: Addis Ababa Urban Agriculture office)

Table 9. Price estimates of crop residues, in Addis Ababa rural kebeles(2002-2005)

No.	Year	Type of crop	Total production	Weight of 1 bale in kg	Price of 1 bale in (ETB)	Total no. of bales	Total price (ETB)
1	2001/2002	Teff	14429100	20	6	721455	4328730
		Wheat	4612300	17	4	271322	1085247
		Barley	334600	17	4	19682	78729

							5492706
2	2002/2003	Teff	13049400	20	6	652470	3914820
		Wheat	5949800	17	4	349988	1399953
		Barley	154700	17	4	9099	36395
							5351168
3	2003/2004	Teff	13701900	20	6	685095	4110570
		Wheat	6247200	17	4	367488	1469953
		Barley	162400	17	4	9553	36211
							5616734
4	2004/2005	Teff	14387100	20	6	719355	4316130
		Wheat	6559700	17	4	385865	1543459
		Barley	170500	17	4	10029	40118
	Total						5899707

(Source: Addis Ababa Urban Agriculture office)

Table 10. Information of the Peri-urban agricultural areas included into Bahir Dar City administration

No.	Name of kebeles	Irrigation development		Forest development	
		Potential Land to be developed (ha)	Presently developed areas (ha)	Potential land to be developed (ha)	Developed area (ha)
1	zenzelma	77	70		297
2	wereb	415	159		5
3	Deshet Abaraj	170	100		35
4	werawamit	57	30		65
5	Sbatamit	200	63		65
6	Wenjata	-			-
7	Ura/Zegee	-			41
8	Yiganda	-			200
9	Werkamlachadir	70	52.125		-
10	Ygend Welake	106	10		40
11	Maj Debrenigist	100	8.5		345
	Total				

(Source : Bahir Dar urban agriculture office , 2005)

Table 11. Information of the Peri-urban agricultural areas included into Bahir Dar City administration

No.	Name of kebel	Livestock development (no.)								Vet.
		cattle	equine s	shee p	goat	poultr y	Apiculture			
							tradi tiona l	Impr- oved	Mod -ified	
1	zenzelma	6567	227	188	87	5400	200	3		1
2	wereb	6146	354	180	500	960	800			
3	Deshet Abaraj	5507	551	220	782	4525	200			
4	werawamit	8031	319	93	280	3121	230			
5	Sbatamit	745	21	5	72	343	39			
6	Wenjata	-	-	-	-	-	-			
7	Ura/Zegee	-	-	34	-	317	142	-	32	1
8	Yiganda	-	-	-	-	114				1
9	Werkamlachdir	4175	246	250	328	1664	432			1
10	Ygiend Welake	324	22	40	36	104	29	2		
11	Maj Debrenigist	1567	88	11	114	672	129			
	Total									

(Source : Bahir Dar urban agriculture office , 2005)

Table 12. Information on kebeles, which were under Bahir Dar city administration

No.	Irrigation development		Livestock population								Remark
	Potential land area to be developed	Land under development	sheep	goat	cattle	poultry	Apiculture	Dairy cows			
								local	exotic	Cross	
1	-	28.88	2277	518	4801	28363	248	4306	95	754	

N.B.:- Additional clarification

There are 5 urban farmers working in cattle fattening

In average each of them fatten 10-15 cattle

There is one cooperative recently organized in milk marketing having 106 members (92 male and 14 women)

Dairy cows population 630

Heifers ----- 144

Calves -----316

Fishing ----- there are 2 groups engaged in fishery activities

Group members are 6 – 22

(Source: Bahir Dar urban agriculture office, 2005)