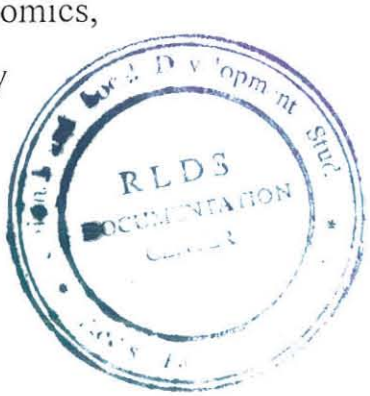
URBAN AGRICULTURE INITIATIVES IN ADDIS ABABA WITH PRACTICAL EVIDENCES FROM SELECTED VEGETABLE PRODUCING COOPERATIVES AND HOUSEHOLDS IN THE CITY

Thesis Research Advisor: Mulat Demeke (Ph.D.)

By: Mohammed Jemal

Masters Program in Regional and Local Development Studies (RLDS)
Faculty of Business and Economics,
Addis Ababa University

January 2002



URBAN AGRICULTURE INITIATIVES IN ADDIS ABABA WITH PRACTICAL EVIDENCES FROM SELECTED VEGETABLE PRODUCING COOPERATIVES AND HOUSEHOLDS IN THE CITY.

Mohammed Jemal

A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment for the Degree of Master of Arts in Regional and Local Development Studies at the Department of Regional and Local Development Studies (RLDS).

February 2002
Addis Ababa.

Addis Ababa University
School of Graduate Studies

URBAN AGRICULTURE INITIATIVES IN ADDIS ABABA WITH PRACTICAL EVIDENCES FROM SELECTED VEGETABLE PRODUCING COOPERATIVES AND HOUSEHOLDS IN THE CITY.

By:

Mohammed Jemal

Faculty of Business and Economics

Approval by board of examiners:

Dr. Mulat Demeke
Advisor

Signature

Examiner

Signature

Examiner

Signature

ACKNOWLEDGMENTS

I would like to express my gratitude to some of the people who have assisted me in undertaking this piece of research in particular and during my graduate study in general. Accordingly, let me start by extending my special thanks to my advisor Dr. Mulat Demeke not only for his excellent guidance during the study, but also for the greatest lesson that he has taught me in my life.

I am deeply grateful to Ato Abiye Alemu and Ms. Camille De Stoop of ENDA-Ethiopia for their generous help in my research. My sincere thanks are also due to Ato Mulugeta Getu at the Ministry of Agriculture for his support in supplying me with the necessary information and materials.

Finally, my heartfelt gratitude goes to my sisters Nuriya Jemal, Zebiba Jemal, and Eskedar Berhanu for the great support they have provided me during my stay in the graduate study program in general.

Table of Content

Chapter Three

Chapter Four

List of Tables

Tables: page

ABSTRACT

Many of the urban development studies on the city of Addis Ababa nearly always concentrate on the non-agricultural activities, as the result of which information and even base-line data on urban agriculture in the city are missing.

This exploratory and descriptive study intends not only to contribute something in filling-in this gap of information on urban agriculture by taking one component of urban agriculture, which is vegetable production, but also has the intention of attracting attention to the relatively neglected area of urban agriculture. To this end, the study attempts to characterize the vegetable producing urban farmers in the city; to explore and describe the types, the scales and performances of vegetable production activities in the city. It also tries to examine the income, employment, and consumption effects of vegetable production; to identify and analyze the major problems and constraints as well as to indicate implication for future government policy planning and management of urban agriculture.

Major findings of the study prove that the activity of urban agriculture in Addis Ababa has been significantly contributing to the income generation of the urban poor families thereby contributing towards alleviating the intensity of poverty. Additionally, findings of the research show that, the sector has also been of a paramount importance in providing these families with food security and employment opportunities. However, results of the findings on the other hand indicate that urban agriculture in Addis Ababa is being highly constrained by various factors amongst which lack of government recognition, constraints on access to inputs and services are worth mentioning.

Departing from all these outcomes of the study therefore it has been highly recommended that the government give sufficient attention to the industry particularly in the areas of support for research and development, in the areas of provision of extension workers, inputs, and credit facilities for the overall improvement of productivity and the successful development of urban agriculture.

CHAPTER ONE

1. Introduction

1.1 Background to the study

Rapid urbanization has been one of the major occurrences of the world, particularly that of the developing world. In 1988, about 25% of the developing world's absolute poor were living in the urban areas, by 2000 about 56% of the absolute poor would be living in urban areas according to the World Resource Institute (WRI; 1999:15) and urban areas are expected to surpass rural areas in population around the year 2005 (FAO; 1998:29). In particular Africa in the past was a predominantly rural continent but at present the cities in Sub-Saharan Africa are growing with an exceptional rate of 5% or more annually and by the year 2020, half of the population in this region will be urban (WRI; 1999:19).

The capacity of governments to manage this urban growth is under threat in many developing countries. According to Drescher, finding the ways to provide food, shelter and basic services to the city residents and create "sustainable cities" are real challenges for many city authorities around the world and especially in sub-Saharan Africa (Drescher; 2000: 8).

In response to these challenges, a growing number of urban dwellers are engaging in agricultural activities. This phenomenon has been witnessed all over the world, especially in the less developed countries. It is now estimated that 800 million people are engaged in Urban Agriculture worldwide and play an important role in feeding the

world's cities (UNDP 1996, FAO 1999). Urban Agriculture is also emerging strongly in sub Saharan Africa, where the fastest urban growth is occurring in countries least equipped to feed their cities (Ratta & Naasr, 1996 in Mougeot; 1999: 8).

However, the major problem in most of these less developed countries is lack of recognition of urban agriculture as a major contributor to food self-sufficiency and its many other actual and potential benefits towards sustainable urban development. In most of these countries there is no even base-line data and information on the very activity of the industry (Jacobi et al; 2000: 11).

Ethiopia is one of these countries where, despite its existence and significant contribution, urban agriculture is not only disregarded and unrecognized by researchers but also is underestimated and given very little attention by urban development studies and little understood by urban planners and decision makers.

Particularly in the city of Addis Ababa where the practices of urban agriculture are highly prevalent, base-line data and information on the actual and potential roles of urban agriculture to the community welfare and socio-economic development endeavors is scanty. This is because hardly any significant research has so far been conducted on urban agriculture to find out and indicate the potentials, problems, constraints and their policy implications on the industry. Such a huge gap of information and lack of base-line data on this important matter makes an exploratory type of research such as this, a relevant one.

1.2 An Overview on the Study sites

According to the 1994 Population and Housing Census of Ethiopia (PHCE; 1994), the population size of Addis Ababa has grown from 443,728 in 1961 to 683,530 in 1967, 1,167,315 in 1978, 1,423,111 in 1984 and 2,112,737 in 1994. Compared to the 1984 census, the 1994 population size has a shown 3.26% increase (PHCE; 1994).

In this biggest city of the country where the population growth is most alarming, urban agriculture is highly practiced as a survival strategy, both at the household and cooperative levels. Particularly, along the banks of the small rivers in Addis Ababa, there are vegetable producing farmers who are organized into five cooperatives, namely; Mekanisa-Furisaris; Kolfe-Lideta; Kebena-Bulbula; Shankla-River; and Keranio-Medhane-Alem cooperatives.

The cooperatives' members are households involved in intensive farming on the land commonly owned by the cooperatives as well as on the plots of land individually owned. All these cooperatives and individual households produce different types of vegetables using natural waterfalls but mainly using irrigated water from the rivers Gefersa, Tinishu Akaki, Tiliku Akaki, Kebena, Bulbula and other small streams in the city.

During the field survey for this research, a total of about 1.25% (about 274 ha) of the urban land of Addis Ababa was occupied by the five vegetable producers' cooperatives commonly and their household members individually (AAMPPO;

1999). According to the interviewed officials at the Ministry of Agriculture, except for such agricultural activities, most of the land occupied by these cooperatives and individual households is not suitable for other purposes such as for construction.

While a relatively small amount is used for household consumption, most of the fresh vegetable produce, both from the communal land of all the cooperatives and the individually owned plots of the households, is supplied to the local market. A recent survey conducted on the demand and supply of vegetable production has estimated that more than **18%** of the fruit and 42% of vegetable demand of Addis Ababa is supplied by farmers producing within the city (AAMPPO; 1998: 85).

All the five vegetable producers' cooperatives were not at all imposed on the members by anybody when they were first formed in the mid 1970's. Rather they were all inspired by the members themselves in order to make use of the commonly owned land and also to increase sustainability of their farming activities such as by supplying input at a lower cost. The cooperatives were also meant to be used as a strategy to gain economies of scale in areas such as technical and enterprise supports, supply of markets, as well as protection against any possible threat in their agricultural activities.

The cooperatives have enabled the members understand the importance and advantages of organizing themselves and of discussing and solving their own problems. They have also created unity and solidarity among the members and the

ambition to strengthen themselves in solving their common problems. The knowledge and building of self-confidence that they have initiated have helped them to become more independent. Each cooperative also does the paying of land tax to the government on behalf of its members. On top of all these activities, the cooperatives arrange a mass cultivation strategy in which all members of a cooperative cultivate one's plot when the needs arise.

Members of each cooperative have equal rights and responsibilities in all the activities of the specific cooperative in which they are members. Shares from the cooperative are distributed on an equal basis depending on the evaluated performances of the individual member. Each member of the cooperative has the right to elect and be elected.

Inspite of their contribution particularly to the low-income households, however, three of the five vegetable producers' cooperatives in the city of Addis Ababa namely, the kolfe-lideta, the shankila-river and the keranio-medhanialem have not been officially recognized by the government as this study was underway. And as it is to be discussed latter, lack of legal recognition has hindered the possibility of getting credit and other important facilities to improve the productivity of the urban farming. The unrecognized cooperatives have temporary title deeds as the result of which they are obliged to pay urban land tax and other government duties. However, this does not give them all the legal rights they need in order to invest on permanent structures.

This research is based on a detailed survey and field research of a sample of members from the three purposely selected vegetable producers' cooperatives – Shankila-River, Kebena-Bulbula and Kolfe-Lideta. The reason behind selecting these particular cooperatives is the intention of the research to accommodate the two locational types of urban agriculture, which are on the peri-urban (i.e. on the periphery part of the urban area) and on the inter-urban (i.e. within the mainstream of the urban area). Accordingly, Shankila-River and Kolfe-Lideta are chosen for they are peri-urban vegetable producers' cooperatives whereas Kebena-Bulbula is chosen for it is an interurban type. A brief description of each of these three cooperatives follows.

The Kolfe-Lideta Vegetable Producers' Cooperative

This cooperative consists of members from two groups one of which is from the Soramba community in Woreda (district) 24 Kebele (locality) 09, and the other group from the Abajale community in Woreda 25 Kebele 04. From the two groups, the cooperative has a total of 108 household head members, most of who have been residents of the localities for decades. Of the total members, 90 of them are men while 18 of them are women.

The cooperative, ever since its establishment in 1976, has been producing different kinds of vegetables such as varieties of cabbages, carrot, potato etc on a total land size of 81.3 hectare occupied as communal and private plots. Like in the other two cooperatives, besides on their own private plots, members of the cooperative are expected to work on the communal plots. The produce from the private plots is used

both for household consumption and the larger share for local markets while the produce from the communal plots is for sale. This is also true in the other two cooperatives.

Members of the cooperative use traditional practices in diverting the Akaki River, which is one of the big streams crossing Addis Ababa, to irrigate their vegetable farms. Like the other similar cooperatives in the city, members of this cooperative use lumps of soil and stones for making an irrigation dam. Stone is used as supporting structure while soil is used as a filling material for making canals to divert the river water to the communal as well as private plots. Kolfe-Lideta, at the time of this research is one of the three cooperatives in the city that do not have formal government recognition.

The Shankila-River Vegetable Producers' Cooperative

This cooperative is located in Woreda 06 Kebeles 01, 08 and 13; and Woreda 24 Kebeles 11, 12. The cooperative was first established in 1978 and reorganized in a new form in the year 1994 and now it has a total of 52 members (42 males and 10 females). Members of this cooperative mainly use irrigated water from the Shankila and Addis Ketema Rivers to intensively cultivate their 10-hectare size vegetable farms. Of the total area occupied by the cooperative, about 3 ha of land has been used by the cooperative members as communal plots, with about 7 ha of land allocated to all members as private plots.

The cooperative uses a dam constructed by the members themselves for irrigating their cultivation. As this research was underway, this cooperative also did not have formal recognition from government.

The Kebena-Bulbula Vegetable Producers' Cooperative

Located in Woreda 15 Kebele 36, the Kebena-Bulbula Vegetable Producers' Cooperative was first established in 1976. The cooperative now has a total member of 30 (19 male and 11 female) who intensively cultivate various types of vegetables on their total land size of 7.5 ha occupied as communal and private plots.

The cooperative had a modern dam for irrigating the communal and private plots until it was completely destroyed with a powerful and unexpected flood in the year 2000. The members could not afford to reconstruct the dam and therefore they now use sacks filled with sand as a dam for diverting the river and irrigating their farms. However, the members found this to be obsolete and expensive in that it is not effective and also very often gets destroyed with flood especially during rainy seasons. The cooperative gained its legal recognition in 1998.

1.3 Research Problem, Objectives and Significance

Many of the urban development studies and literatures on Addis Ababa, as it is also true for many other cities of the developing countries, concentrate on housing, urban services, and non-agricultural informal activities. Nearly all of these studies and

literatures have either excluded or given too little attention to Urban Agriculture in the city.

Consequently, the real potential of urban agriculture in Addis Ababa to satisfy basic needs – that is, providing food (through improved production and distribution systems), income, employment, and environmental protection – and its role in the wider context of savings on transport costs, has not been well understood. Despite the fact that there is no other issue that receives such consistent attention and priority as feeding people, the relation between the nutritional priority and the balance between sources – that is, rural production and urban production is not at all clear. In an attempt to contribute towards filling-in this gap of information, the following have been the general and specific objectives of the research.

General objectives of the research:

- To generate base-line data and other information on Urban Agriculture at the household and community level that could also serve as a springboard for further researches which in turn can influence policy makers and other relevant bodies to effectively incorporate Urban Agriculture into their development programs, and
- To examine the effect of urban agriculture on urban poverty in general.

Specific objectives of the study include the following:

- To characterize the vegetable producing urban farmers in Addis Ababa,
- To explore and describe the types, the scales and performances of vegetable production activities going on in Addis Ababa,
- To examine the income, employment, and consumption effects of vegetable production on the cooperatives and individual households, and
- To identify and analyze the specific problems and constraints of vegetable production in the city of Addis Ababa both at the household and cooperative levels, and to indicate the implications for future government policy planning and management of Urban Agriculture.

The research will have some **significance/importance** in that it will be able to initiate further researches on the neglected issue of Urban Agriculture, by contributing some findings that can possibly serve as a springboard.

Additionally, the research will play some role in creating awareness on anyone interested in the subject matter of Urban Agriculture in Addis Ababa and more importantly its findings can be informative specially to a great number of different organizations that influence and/or are influenced by Urban Agriculture activities in the city. Such organizations may include: farmer associations, and other support entities; and institutions, including independent and university research centers; international development agencies; and other stakeholders.

1.4 Hypotheses of the study

In an effort to achieve the aforementioned general and specific objectives, this research will be examining some hypotheses amongst which the following are worth mentioning.

- Urban agriculture in Addis Ababa is generating income and employment opportunities to the farming urban dwellers in the city.

- The development of urban agriculture in Addis Ababa is being impeded by institutional constraints; constraints on access to resources, inputs and services; as well as postproduction constraints.

1.5 Methods of Sampling and Data Collection

1.5.1 Methods of Sampling

In an effort to generate the necessary data and information from the representative sample of the survey population which is relatively homogeneous, all the 30 memebers of the kebena-bulbula and using a systematic sampling technique, a sample size of 30 household head members from each of the kolfe-lideta and shankila-river cooperatives have been drawn. The sample size for all cooperatives has been 30 by considering the number of members in the kebena-bulbula, which is equal to 30. And the reason for using systematic sampling technique for the two cooperatives was that each of them had a complete name-list of its members,

facilitating the use of this particular sampling method. The specific sampling procedures followed were therefore the following.

1. selecting of the three cooperatives among the five cooperatives that are involved in Urban Agriculture activities,

2. obtaining the name list of members in the selected cooperatives, from the respective offices of the cooperatives,

3. preparing a new sampling frame with sequential numbers on the basis of which the systematic sampling can be conducted for the kolfe-lideta and shankila-river cooperatives,

4. conducting of the systematic sampling for the lolfe-lideta and shanikila river cooperatives.

1.5.2 Methods of Data collection

The research is based on both qualitative and quantitative data and information that was gathered from the vegetable producers' cooperatives and households as well as from the Ministry of Agriculture and the relevant kebeles in the city, using the following data-collection instruments.

Questionnaire administration – administration of questionnaires was the chief instrument for the collection of data in the research. Accordingly, a multiple pages of questionnaire, asking both qualitative and quantitative questions, were responded by each of the informants with the help of trained enumerators.

Focus group discussion– This was conducted by forming five small homogeneous groups of selected informants from the survey population with some 8 to 12 individuals in each group. This was an appropriate instrument for qualitative data collection in that it provided some quality control on the accuracy of the responses given by the participants, as the participants in the focus group discussion checked on each other's opinion. Moreover, it gave the chance of gathering valuable information from many people at a time.

Semi-structured-interview– This was an extensive and qualitative interview conducted mainly with the respective officers of the three cooperatives on the more complicated and administrative issues of the cooperatives. In addition to this, some officers from the ministry of agriculture and the kebeles in which the cooperatives are located were also interviewed.

Direct observations – The researcher, along with the enumerators made some personal observations to all the urban agriculture sites of the three vegetable producers' cooperatives and attempted to compare some of the responses of the respondents with the fact on the ground. Visits and observations were also made

by researcher to as many households involved in the cooperatives as possible in order to perceive the characteristics of the households, their living standards, and so forth.

All the collected, checked and coded data had been entered into and processed by SPSS (Version 9), which is the appropriate statistical software-package. All the outcomes from the software have then been analyzed using descriptive tables, percentages, measures of the central tendency and so on.

1.6 Scope and Limitations of the Study

The practice of Urban Agriculture includes the cultivation of crops, vegetables, herbs, fruits, flowers, parks, forestry, fuel wood, livestock (cattle rearing for dairy products, sheep, goats, poultry, and so forth), aquaculture, bee keeping and so forth. However, the scope of this thesis research will be limited to investigating and explaining the character and role of Urban Agriculture in Addis Ababa, based on a survey of a sample of members from three of the five vegetable producers' cooperatives in the city. This is mainly due to the time and budget constraint faced by the student researcher.

The major limitation to the study has been that its findings could not be compared with previous data because of lack of previous statistics on urban agriculture in the city. In an effort to deal with this limitation, studies on the cases of other developing countries (especially on that of the African countries) have been reviewed as much as possible.

Chapter Two

2. Urban agriculture: Some Theoretical and Practical Issues

2.1 What is urban agriculture and who are the urban farmers?

2.1.1 Current definitions and the urban ecosystem connection of urban agriculture

The first question that arises while reviewing the literature is what exactly is meant by urban agriculture. The term urban agriculture, or 'Intra- and Peri-Urban Agriculture', had for a longer period of time been used just by scholars and occasionally in the media. Now it has been adopted widely (Smit et al. 1996, FAO, 1996; COAG/FAO 1999 in Mougeot; 2000: 3) and this makes the need to further define and specify the concept.

To begin with, urban agriculture should not be confused with 'home gardens'. This is because as defined by Hoogerbrugge and Fresco, a home garden is a small-scale, supplementary food production system by and for household members that imitate the natural, multi-layered ecosystem (Hoogerbrugge et al; 1993: 11). It does not often provide the main source of income or food to the household and this distinguishes it from commercial horticulture or arable cropping. Moreover, home garden is practiced both in the urban and rural areas and is only meant for supplementing on food and income, while several forms of urban agriculture are indeed providing the major source of food or income for the urban household. For that reason home gardens are only one kind of all the different forms of agriculture that are found in cities.

Urban agriculture has been perceived and defined from different dimensions by several authors. The more common definitions of urban agriculture according to Mougeot are based on the following determinants (Mougeot; 2000:5):

- Types of economic activities;
- Food/non-food categories of products and subcategories;
- Intra-urban and peri-urban character of location;
- Types of areas where it is practiced;
- Types of production systems;
- Product destination and production scale.

The most common element of the reviewed definitions by far is location, and probably it is the biggest source of argument. Few field studies actually differentiate between intra- and per-urban locations, or if they do, criteria used vary widely. Those who do differentiate have used as criteria for intra-urban agriculture: population size, density thresholds, official city limits, municipal boundaries of the city, agricultural use of land zoned for other use agriculture within the legal and regulatory purview of urban authorities (Maxwell et al; 1998: 6).

For peri-Urban agriculture, the location definition is more problematic. Peri-urban locations are in closer contact with rural areas and tend to undergo, over a given period of time, more dramatic agricultural changes than do locations in

more central and built-up parts of the city (Mougeot; 2000: 21). Authors have been trying to delineate the outer boundary of the peri-urban area, using for instance urban, sub-urban and peri-urban zones based on varying ratios of buildings and roads and increasing ratios of open space per km^2 (Losada et al; 1998: 6). Others use the maximum distance away from city center within which farms can supply perishables to the city on a daily basis, or the area within which people living within the city's administrative boundaries can travel to engage in agricultural activities (Lourenco-Lindell; 1995: 16).

While referring to all the dimensions of urban agriculture, most authors define it only in general terms. Studies rarely use their findings to refine the urban agriculture concept of the day (Mbiba; 1998: 7) or to analyze how this concept is related to other development concepts.

A striking feature of the reviewed definitions is that few of them contrast urban and rural agriculture, even less so the implications of one for the other (Binns et al; 1998: 9). Indeed, all building blocks, perhaps except location, can apply to rural agriculture as well; they do not suffice to brand urban agriculture and justify the need for specific knowledge, know-how and policy.

Mougeot argues that the lead feature of urban agriculture, which distinguishes it from rural agriculture, is its integration into the urban economic and ecological system (Mougeot; 2000: 7). Richtel and others supporting this idea said that it is

not its urban location, which distinguishes urban from rural agriculture, but the fact that it is embedded in and interacting with the urban ecosystem (Richter et al. 1995: 9). However, this integration in the urban ecosystem is not captured in most definitions of the concept, and less so developed in operational terms

Based on the above background then, Mougeot has come up with the following revised and more comprehensive definition of the concept of urban agriculture (Mougeot; 2000: 10).

> *Urban agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area.*

2.1.2 Who are the Urban Farmers

The urban farmers are women and men coming from all income groups. But the majority of them are low-medium income earners, who grow food for self-consumption or as income generation and most of the cultivation is informal with little if any support (Jacobi et al; 2000:4).

According to the reviewed literatures, women tend to dominate certain components of urban cultivation such as backyard gardening and small-scale animal husbandry. Women are still disadvantaged in the formal sector of the urban economy and therefore get involved in small- and micro-scale production. Urban food production offers opportunities to be integrated into other household activities and women uphold the responsibility for household food security. Jacobi and others, indicate that men tend to dominate the commercial urban food production and in some countries children are also involved mainly in weeding and watering (Ibid).

Mougeot on his part argues that urban farmers do not at all form a homogeneous group of people and they can be found among almost every socio-economic group of the city. For that reason, he identifies three farmer categories, classified according to the reasons for practicing urban agriculture (Mougeot; 1993: 14).

1. Low-income survival farmers; they practice Urban agriculture mainly to survive and achieve a combination of nutritional and socio-economic benefits,

2. Middle-income home gardeners; they practice urban agriculture mainly to provide supplemental food and/or income;
3. Agribusiness 'farmers'; they practice urban agriculture to obtain income.

In the second category are also found the upper-class people who have their gardens maintained by their servants and watchmen. As to the numbers of farmers per category, the literature does not state any but it appears that the agribusiness farmers are a minority.

Urban agriculture is mostly practiced at household level, but in several places urban farmers work together. For instance in Addis Ababa (Ethiopia) there are five cooperatives involved in urban agriculture, alongside the rivers and the streams of the city. Some of the produce is consumed by members of the cooperatives, but most of it is destined for sale (Egziabher; 1993: 15).

While reviewing the literature what strikes is the fact that most of the time urban agriculture is a spontaneous activity and not officially planned. Most urban farmers operate informally and therefore actual facts and figures of who the urban farmers in a city are and how many they are in number are most of the time missing.

2.2 preconditions, reasons, problems and constraints of practicing urban agriculture

2.2.1 Preconditions of urban agriculture

Jacobi and others argue that the basic conditions of agricultural activities that determine the occurrence of urban agriculture include natural conditions; physical infrastructure and services; socio-cultural conditions; institutional conditions; and economic conditions (Jacobi et al; 2000: 7)

Natural conditions refer to soil conditions and climatic conditions (amount and seasonality of rainfall and temperature) that determine urban food production. Very low annual rainfall, for example in Cairo or Lima (25mm) is restrictive to the development of urban crop and vegetable production but can offer opportunities for animal husbandry (Drescher; 2000: 10). In areas with favorable climatic conditions, lower expenditure for fertilizers and irrigation as well as low pest and diseases as well as limited natural hazards (flooding, storm etc), a higher occurrence of urban agriculture is expected because such favorable conditions reduce risks and the need for big investments to get started and hence making urban agriculture an option for all income groups.

Physical infrastructure and services as one condition of urban agriculture refer to the important aspects such as availability of inputs, access to formal or informal credit, urban extension services and so on. However, the basic requirements for

production are the availability of water and space and if either one or both are not available, households cannot respond to crisis by entering into any kind of production (Jacobi et al; 2000: 10). Regarding this point, Drescher argues that availability of infrastructure for water coupled with access (here referred to as institutional condition) to water can compensate for lack of rainfall and, inspite of this, lead to Urban Agriculture (Drescher; 1998: 9). But if urban agriculture is dependent on infrastructure, it will be dominated by certain groups having access to it and most likely more economic oriented. Therefore, urban agriculture can benefit if it is incorporated in urban nutrient recycling (organic water management in cities) (Furedy et al. 1997; IDRC 1999; Kiango & Amend 1999 in Drescher et al; 1998: 10).

Socio-cultural conditions of urban agriculture refer to the households farming traditions and food preferences as an entry point into urban agriculture and indicates that urban agriculture is not a completely unknown and unskilled activity in many cases. Groups who culturally have a farming background easily start urban agriculture. Food preferences are related to specific types of vegetables and other agricultural produce, often local varieties, which are not marketable or not available on local markets and therefore produced on household basis.

The other supporting socio-cultural condition that influence urban agriculture is the degree of self-organization of urban residents and in this case that of farmers (e.g. the formation of user-groups, cooperatives, associations). Public acceptance

of urban agriculture , which is in some areas closely related to farming traditions, in other regions probably more to the issue of sustainable city development and degree of awareness on food quality is seen as another favoring condition. The degree of acceptance of individual property rights, which relates to the observation that urban agricultural produce is very often subject to theft (Drescher; 1998: 11), is also taken by some as an important condition for urban farming.

Economic conditions of urban agriculture refer to the urban labor market and the shortage of adequate and accessible income opportunities and an unsatisfied demand for agricultural products in quantity and quality. The condition of unemployment would force people to enter into informal jobs, like urban agriculture to gain income.

Poor rural-urban infrastructure and/or high transport costs also generally favor the production of perishable products (e.g. leafy vegetables, milk and milk products) in cities when they are integral parts of the human consumption.

The other economic conditions are linked with physical infrastructure (availability of inputs, e.g. shops which sell seeds, tools etc.) and the farmers' access to formal or informal credits and saving schemes. On the other hand the availability of and the access to different market channels is also closely related to economic

conditions because a major constraint of many urban small-scale producers is lack of selling opportunities (Jacobi; 2000: 10).

2.2.2 Reasons for Practicing Urban agriculture

2.2.2.1 Health, nutrition, and food security

Urban agriculture provides the poor with control over the nutritional balance of the family diet. More expensive food items, like fruit, vegetables and meat, are supplied through home production. The improved nutritional balance reduces protein and energy malnutrition as well as deficiencies of essential micronutrients and vitamins.

It provides fresher food. Food from outside the city – especially perishables like fruit, vegetables and fish – loses much of its nutritional value in transit and storage. These benefits of fresher food from local production are available not just to farmers' families but also to the entire city.

In relation to this point, Smit and others argue that by reducing hunger and malnutrition, urban farming makes the urban poor healthier, more productive, and more resistant to diseases. In addition, farming activity cleans and greens the living environment, reducing pollution and disease-causing pathogens and vectors in the environment (Smit et al; 1996: 160). Household waste and refuse can be recycled for agricultural uses, providing additional environmental benefits.

Therefore, the benefits offered by urban agriculture are both quantitative and qualitative: enhancing the quantity of food available reduces hunger, while improving the quality of food fosters better health and nutrition. While this can easily be inferred, very few studies in African cities have attempted to rigorously test the link between urban agriculture and nutrition by comparing the nutritional status (assessed by the height-for-age, weight-for-age and weight-for-height indicators) of children aged under five, from farming and non-farming households (UNDP, 1996).

Among the very few studies conducted is the one in which Ogden (1993) reported various indicators of pre-schooler nutritional status in her study of urban food security in Kigali. She noted that urban agriculture was positively associated with nutritional status in some income groups, and under some conditions of maternal employment. In Nairobi, Mwangi (1995) also reported few differences in mean nutritional status (expressed as a percentage of the expected mean), and those children from non-farming households were somewhat more likely to be moderately malnourished.

Urban agriculture also significantly contributes to the food security of many major cities, both as an important component of the urban food system and as a means for vulnerable groups to minimize their food-insecurity problems. As mentioned in the document of UNDP (1996), self-production and barter increase

the food security of the poor by making it possible to obtain food they could not otherwise afford – even during bad financial times. Because daily food intake does not depend on their unstable daily income, poor families gain control over the quantity, quality, and stability of their diet.

In relation to this, city case studies indicate a considerable degree of self-sufficiency in fresh vegetable and poultry production as well as other animal byproducts. For instance, Dakar produces 60% of its vegetable consumption, whilst poultry production amounts to 65-70% of the national demand (Mbaye et al; in Klemsu; 2000: 104). In Accra, 90% of the city's fresh vegetable consumption is from production within the city (CENCOSAD 1994 in Klemsu; 2000: 104). In Dar es Salaam, more than 90% of leafy vegetables coming to the markets have their origin in the open spaces and home gardens (Stevenson et al. 1996 in Klemsu; 2000: 104).

Regarding the meeting of household food needs, urban agriculture in Harare is estimated to provide families engaged in the activity with staple food for up to four months in a year (Mbiba; 1999: 34). Figures for Accra range from between one and eight months (Zakariah et al; 1998:21). Kampala residents living within a 5-km radius of the city center produced about 20% of the staple foods consumed within that same area (Maxwell; 1994: 19).

The hypothesis that urban agriculture does improve the food security of vulnerable households has been proved by many studies that have undertaken actual measurements of the impact of urban agriculture on food security. Mwangi compares farming and non-farming households in low-income neighborhoods in Nairobi and notes that, while mean consumption is well below estimated requirements in all cases, farming households are better off in terms of both energy and protein consumption, and that farmers participating in an organized urban agriculture support programs are significantly better off in both categories (Mwangi; 1995: 15). The farming households produce 20-25% of their food requirements and are significantly less dependent on gifts and transfers (Klemsu; 2000: 104).

Sawio also reports that nearly 50% of 260 Dar es Salaam residents indicted that urban agriculture provided 20-30% or more of their household's food supply (Sawio in Klemsu 2000; 104). In Kampala, 55% of 150 producers obtained 40% or more and 32% obtained 60% or more of their household food needs from their own urban garden (Maxwell et al. 1992 in Klemsu; 2000: 105). In Harare, a disaggregated profile of self – produced food consumption and its variation by income indicated that 60% of food consumed by a quarter of the low-income group was self-produced (Bowyer et al; 1996: 115).

Therefore, it appears that urban agriculture makes a vital contribution to the food self-reliance of many major cities. As repeatedly mentioned by Mougeot, food

self-reliance is not self-sufficiency, but it can go a long way towards reducing the food insecurity of vulnerable groups (Mougeot; 1994: 25). Urban agriculture cannot be expected to satisfy the urban demand for staple crops like cereals and tubers, which can easily be stored and transported with limited losses from rural areas. What must be recognized and appreciated is that urban agriculture, with limited support, already supplies a significant share of food, especially the more easily perishable vegetables and poultry products, to many cities.

For instance fresh vegetables that make up an important component of diversified diets can be expensive items for the urban consumer. This is often due to the costs incurred in their marketing , in terms of transportation from producing areas and the sheer quantities that perish during transportation. The marketing channel is an important factor in the cost of food, and the location and extent of local food production may shorten the path of distribution from producer to consumer. Cost-benefit analyses of market vegetable crops in Lome and Bissau have shown that net incomes are higher where there are fewer middlemen (Schilter 1991, cited in Mougeot 1998).

However, with all these facts in mind, urban food production should be taken just as an important component of food security and also complementary rather than competitive to other urban food supply systems.

2.2.2.2 Economic benefits of urban agriculture

Urban agriculture has benefits that are as great as the health, nutritional and food security benefits and the major economic benefits of urban agriculture can generally be seen in terms of its role in the areas of: income generation, employment, and enterprise development; urban food supply and land use economics.

Income generation, employment, and enterprise development

Urban agriculture is a competitive economic activity and the industry of choice of millions of urban entrepreneurs. According to a document of UNDP, it also provides income-generating opportunities for people with low skills and little capital, as well as for people with limited mobility, including women with children and aged persons (UNDP; 1996: 168). For many private and public entities – including port authorities, hotels, restaurants, airports, municipalities and electric and water utilities – it provides opportunities for secondary incomes.

The ability to earn cash income is a significant determinant of urban food security. And perhaps the biggest challenge urban dwellers face is that the majority of them work in sectors where wages are low, working conditions uncertain and job tenure insecure. In urban sub-Saharan Africa, employment in sectors that pay regular wages accounts for less than 10% of total employment (Rondinelli and et al.; 1993: 102).

Be it small or large, legal or illegal, informal or formally recognized, urban farmers around the world, especially in the developing countries, are producing competitive incomes through urban farming. For instance in Dar es Salaam, urban agriculture was the second-largest employer in 1988, after petty trading and labor with twenty percent of the working age adults participating in urban agriculture (UNDP; 1996: 169). In Jakarta, a group of farmers runs a profitable vegetable farm on land allotted in return for services inside the grounds of a racetrack (Ibid.).

Production of food in the urban has a significant multiplier effect on the city economy; it generates economic activity in related industries. For instance those that supply agricultural inputs such as fertilizer, seeds, feed and extension services, as well as storage, transportation, canning, marketing and food processing industries. According to Tinker (1993 cited in UNDP; 1996: 170), street food vendors in Bangkok and elsewhere grow their own food and cook it for sale every morning. In Bamako, Mali, entrepreneurs supply compost excavated from garbage dumps to meet farmers' demand for fertilizer (UNDP; 1996: 171). In some cities, as many as one-fifth to one-third of all families are engaged in agriculture, with as many as a third of these having no other source of income (Lee-Smith et al; 1993: 160).

Most of the available literatures on urban agriculture emphasize the fact that urban agriculture is also an easy industry to enter. This is mainly because it can easily be started on a small scale, on informally accessed land (paying no or little rent), with few and inexpensive inputs and limited technical knowledge and skills. Regarding this fact, Sanyal says that in Lusaka, urban agriculture has provided jobs for those whose skills did not qualify them for formal sector jobs – including women, teenagers and retirees – at a higher rate than other informal sector activities (Sanyal; 1985 cited in UNDP; 1996: 172). Though the output at this stage is usually low and inefficient, an enterprising farmer can, over time, improve the inputs, increase skills and knowledge, enhance the efficiency of production and widen the scale of the activity – all with small incremental investments. The problem is however, poor farmers have little or no financial capacity to absorb economic shocks, especially when they have little official support.

According to the reviewed literatures, however, despite the fact that urban farming provides secure jobs to many in the city, more often than not, it is not recognized in labor statistics or included in economic data collection. Urban farming often goes unreported; individuals may not count their self-employment in farming as a job, and statistical surveys may ignore the money a family saves by growing food at home.

Urban agriculture, urban food supply and economic use of land

Besides its contributions to improved economic conditions for individuals and families, urban agriculture also offers a varity of macroeconomic benefits. This is because urban agriculture strengthens the economies of towns and cities by adding a substantial industry that supplies a basic demand item – food, especially vegetables. Regarding this point Smit says that the input, production, processing and marketing activities linked to urban farming create considerable economic activity in the city (Smit; 1996: 163).

Food is among the largest industries in most countries and in many places, a significant portion of food production occurs within urban regions, and urban farming is a well-established and extensive industry. For instance, a study conducted in 1995 on Bamako (Mali) indicated that the city was self-sufficient in horticultural products, and some products were shipped outside the metropolitan area for consumption (UNDP, 1996). Therefore, besides being the main source for non-cereal nutrition of a large proportion of the urban poor, in many countries urban farming is satisfying a significant percentage of the urban food demand, comprising a fair share of the nation's agricultural industry.

Reviewed literatures support the contention that in lower-income countries, urban farming is an integral part of the urban food supply. This is because it provides products that the rural farming cannot supply, particularly those perishable

products such as vegetables that suffer in transport and also require rapid delivery when ready. It is thus complementary rather than competitive with rural farming. It contributes to the national economy and increases the efficiency of the food supply.

According to a UNDP document, urban agriculture is an economical use of land for a number of reasons among which the following summarized ones are worth mentioning (UNDP; 1996: 177-178).

- It generates income from temporarily available land at the growing periphery and at the renewing core,
- It puts idle water bodies, wetlands and steep lopes to productive use and maintains the land,
- It generates income from idle, unbuilt parts of oversized facilities (hospitals, factories, military bases, airports and so on),
- It is a compatible open-space use in parks, sports facilitates, universities, roadside verges, utility rights-of-way, riparian and floodplains along rivers and bays, cemeteries and other locations,
- It is a competitive land use in many cases (for example, poultry farms and horticulture on the outskirts of cities),
- Many urban farming techniques need little land space, and some generate a considerable number of jobs,

- Urban agriculture may reduce the maintenance costs for public and private facilities; thus, for instance, roadsides and parklands, rather than being mowed, can be put to productive use.

2.2.2.3 Benefits on sustainable urbanization

Urban agriculture also makes an important contribution to the sustainability of cities by enhancing the environment, improving urban management, contributing to waste management, and conserving resources.

Environmental enhancement

Rapid urban population growth and unmanaged expansion are degrading the environment not only of cities but also of their surrounding bioregions. This is particularly true in the case of most developing countries. The result is polluted air, water and soil; increased temperature; soil erosion; sharply reduced bio-diversity; and increased vulnerability to disasters such as floods. In alleviating this grave urban problem, urban farming not only plays a vital role by reducing the negative environmental impacts of urban growth, but also it highly contributes towards the improvement of urban environment.

In support of this idea, Deelstra and others argue that if appropriately planned and integrated into urban design, urban agriculture can contribute to the comfort of citizens because vegetation can help increase humidity, lower temperatures and introduce more pleasant odors to the city; capture dust and gases from polluted air

through deposition and capture by the foliage of plants and trees, and soils; and help break wind and intercept solar radiation, creating shadow and protected places (Deelstra et al; 2000: 22).

Jac Smit and others on their part consolidate the idea by saying that farming in low-income communities has the potential to improve environmental health in that it can turn unsightly lots into neatly cultivated areas, improve the hygiene of the area through using solid waste and wastewater in farming and reduce air pollution through greening (Smit et al; 1996: 186). Composting at a local level, if well managed, is an efficient option to reuse solid waste to enrich soils. Kitchen wastewater is used for crop irrigation by the poor all over the world (UNDP; 1996: 180). Household wastewater can be biologically treated for local irrigation use. Vegetables and trees in the slums also reduce the vulnerability of the community to disasters such as floods and landslides.

However, although the environmental benefits of urban agriculture are very substantial, a poorly practiced urban agriculture can rather degrade the environment.

Efficient urban management

More often than not, in most low-income neighborhoods, open spaces by roadsides, streamside, utility rights-of-way, sites reserved for future schools and other vacant lots attract refuse and are unhealthy. Urban agriculture can serve to

clean them and maintain them in an orderly pattern, use them for food production, green them to improve the quality of the environment and help free them of antisocial behavior- all at very little cost to the municipality (UNDP; 1996: 184). The improved appearance of these sites is invariably a source of community pride and urban farmers are also the 'eyes on the street' and enhance security in the community as they protect their farms.

Waste management benefits

Today most cities of the world are facing serous problems in managing their waste, resulting in air, water and land pollution in cities and their bioregions. Solid waste and wastewater collection systems are costly for the city administration, yet they do not currently have the capacity to service the entire city as the result of which solid waste dumps are piling up, and landfill space is fast running out (UNDP; 1996: 186). As a direct consequence of inadequate waste collection and processing, waste decomposes on the streets, causing pollution and public health risks.

According to Jac Smit and others, a sustainable future for cities would require a move towards technologies that transform waste into useful products rather than dump it and to this process urban farming can contribute in several ways such as by producing crops for human and livestock consumption, by composting and by processing wastewater for direct production and irrigation (Smit; 1996: 196).

Conservation of resources and disaster mitigation

Farming in the urban area assists the conservation of bioregions and their resources by reducing the pressures to convert deserts, mountain slopes and rainforests into cropland and to cut woodlands for fuel wood. Because urban agriculture methods are intensive, products are produced on a fraction of the land needed for rural production. Urban agriculture is also economic in its use of water. Therefore, both land and water are conserved in urban agriculture. Still the other important way in which urban agriculture helps to conserve energy is by reducing the need for transportation and cooling (Sachs and Silk; 1990 in UNDP; 1996: 189).

Urban agriculture makes two principal contributions to disaster mitigation, although these contributions are perhaps the least appreciated and least understood benefits of urban agriculture. The two contributions of urban agriculture are that it makes productive use of hazard-prone and sensitive areas, and it mitigates civil and economic crises. Reviewed literatures stress the fact that urban agriculture offers a productive use of urban areas that pose a high risk of natural disaster and that are expensive to build on, such as steep slops and floodplains.

2.2.3 Problems of the urban farming

Only very few of the reviewed literatures condemn urban agriculture and say its practice should not be encouraged. Some of these few literatures argue that greater public support to urban agriculture in large cities would fuel rural-urban migration, while several surveys show that most migrants to large cities come from smaller cities and not from rural areas (Mougeot; 2000: 24). The surveys further suggest that migrants arrive in the cities with the initial ambition to work in anything but agriculture and that a majority of urban producers are not recent arrivals.

Others express their fear that public support to urban agriculture could significantly reduce public investments in rural agriculture, while urban agriculture needs intersectional co-ordination of current financial flows much more than major new funding (Ibid). There is a gathering perception that, in an increasingly urban world, development challenges, among which poverty and hunger reduction, will not be met unless holistic agricultural policies tap on urban and rural complementarities, rather than ignoring them (Ibid). The other more frequent argument from the urban planning is that agriculture should be confined to rural areas, as it can interfere with more productive use/rent of land by other economic activities.

However, according to most of the literatures reviewed, the most important problems caused by urban agriculture are production in a polluted city environment and an intensive use of agrochemicals.

2.2.3.1 Cultivation in polluted city environments

Potential health and hygiene problems can result from a number of activities associated with urban agriculture. According to the reviewed literatures, health issues in urban agriculture are mainly related to pollution, both chemical and biological, of food prior to harvesting and possible contamination during marketing and distribution

Pollution from industrial and commercial activity affects the soil, air and water resources that urban farming uses. This pollution in turn poses health hazards to producers, handlers and consumers. The use of untreated wastewater for irrigation purposes is a cause for considerable concern. In the developing world, some 90% of all sewage are discharged, along with the faecal coliform bacteria that cause intestinal diseases, directly into rivers, lakes, streams and coastal waters (Nelson 1996; cited in Klemsu; 2000: 110).

In most cities in the developing world, these water bodies may be the only source of irrigation. In Nairobi, the majority of plots farmed are located along the Nairobi River, which is heavily contaminated with both industrial and human waste (Foeken et al; 2000: 121). Vegetables are grown along the banks of

Accra's streams and drains that carry much of the wastewater in the city (Klemsu; 2000: 111). These waterways are heavily polluted, with both human and industrial waste. Because alternatives are lacking, wastewater from these drains and streams is used to irrigate vegetables. Studies carried out in Accra showed a high incidence of fecal pollution and microbial contamination along the banks of streams and drains used for watering vegetables (Amuzu et al; 1992: 145).

In related studies on food contamination, lettuce was found to contain the highest levels of contamination of all vegetables examined in Accra (Abdul-Raouf et al.; 1993: 119). This is not altogether surprising finding, as lettuce is a low-growing crop, the edible parts of which are likely to be directly contaminated if irrigated with dirty water.

Vegetables grown on polluted soils and in the vicinity of rail, roads and industrial areas can be contaminated with heavy metals (mostly lead), pesticides, sulfur and nitrate (Klemsu; 2000: 109). These toxicants affect the nervous, digestive and circulatory systems, particularly threatening the health of young children (Ibid). Lead is probably most dangerous for children, as it interferes with their vitamin D production and mental development (Ibid).

According to Klemsu (2000: 109), Fundamental factors determining the presence of these metals and toxicants in agricultural produce are the distance of the production area from the source of pollution and the duration of exposure to the

toxicants. Also the type of vegetable grown determines the potential contamination. In general, leafy vegetables with a longer growing period are the most sensitive (Klemsu; 2000: 109).

A study in New York City in 1976 measured the lead and cadmium content in vegetables from 17 urban gardens. The study concluded that the metal content in the vegetables was not high enough to have a negative impact on healthy people, however, children, pregnant women and adults with inadequate metabolic systems may not be able to metabolize and excrete the lead and may be under a health risk (Sewell, 1977 cited in UNDP; 1996: 199).

The fact that green leafy vegetables like spinach are the most vulnerable to heavy metal pollution and root crops and fruit trees are the most resistant has been indicated in other studies in the United States. In relation to this, an expert recommends that green leafy vegetables should be planted a minimum distance of 7.5 meters from roads where leaded gasoline is used (Wade; 1986: 12). Another solution recommended by the expert to the problem of heavy metal content in soil is to add one part organic matter to three parts of contaminated soil to lower the pH (acidity) level (Ibid). The whole idea is that the pH level of soil is maintained above 7.5, lead uptake by the plant is prevented and cadmium uptake reduced.

2.2.3.2 Use of chemicals in urban farming

Excessive and indiscriminate use of agrochemical such as fertilizers, insecticides, pesticides and herbicides may significantly increase agricultural yield, but the residues from them can also have negative impacts on the environment and on human health. Smit and others argue that these residues are harmful to human health, causing, among other health problems, respiratory diseases, sterility, and contamination of mothers' milk and a varity of intestinal diseases (Smit et al.; 1996: 200). The impact on human health according to them occurs through either direct contact or eating food that contains chemical residues.

Chemicals released into the atmosphere through spraying in crowded city areas are likely to affect large number of people (UNDP; 1996: 199). The use of inappropriate insecticides and fungicides is somewhat more likely in urban than rural situations because of broader availability in urban settings and these chemicals may easily get into the hands of uneducated urban farmers and be used on edible plants or crops (ibid). It is therefore even more important to regulate the use of chemicals in urban farming than in rural farming, as well as to train farmers in the most appropriate application methods.

Nevertheless, although the fear of contaminated urban grown food is legitimate, it should not be exaggerated. For example, tests carried out by the Russian State Committee on Standards showing almost identical results to those of Cornel University in New York: crops grown on rooftops in urban areas contained up to

ten times less contaminants than produce bought at local markets or grown on suburban plots (Klemesu; 2000: 110).

2.2.4 Major constraints on urban agriculture

The development of urban agriculture is constrained by a variety of negative attitudes and obstacles despite the fact that it is an economically viable industry. According to Jac Smit and others, if these constraints can be removed and attitudes changed, urban farming will become more competitive and efficient and will add dramatically to the hundreds of millions of residents whom it already serves worldwide (Smit et al; 1996: 211). They identify some constraints on urban agriculture amongst which the major ones include sociocultural biases and institutional constraints; constraints on access to resources, inputs and services; special risks of farming in the city; postproduction constraints, particularly in processing and marketing; and organizational constraints.

Mougeot on his part argues that most importantly lack of positive government recognition in most of the developing countries has constrained urban farming in many ways. He says that the agriculture, food, health, nutrition and environmental policies of most countries do not include urban agriculture, as the result of which the sector's full benefits are not available to urban populations seeking nourishment (Mougeot; 2000: 26). Such lack of official recognition, according to him, leads to insecurity among farmers and consequently limits their commitment to and investment in farming.

Official projects or programs aimed at improving urban agriculture have been relatively rare and typically urban agriculture has not been taken into account in the urban planning process of developing nations in particular. Consequently no sufficient data are collected on urban agriculture and the activity has no identity or validation as a productive sector of the economy, credit agencies, research and development agencies and market agents generally view urban agriculture as a high-risk activity (UNDP, 1996: 214).

In most cases, rural and urban farmers have similar requirements for, and difficulties in obtaining credit. However, urban farmers often have the added difficulty that potential creditors do not recognize urban agriculture as a significant industry.

The other critical institutional constraint to urban agriculture being access to land, access to farming inputs – such as seeds, fertilizer, pesticide, equipment, and the like is also another major constraint facing urban farmers in most of the developing countries (Drescher et al; 1999: 12). Regarding this issue, Jac Smit and others say that these inputs are not readily available in cities; the markets and sales channels either are not developed and organized or are oriented towards rural farmers (Smit et al; 1996: 219).

The other constraint on urban agriculture is that, urban food markets are designed, often since colonial times; to import food from rural areas and the input-producing agribusinesses are also geared to serving rural agriculture. The input and output market systems and infrastructure thus favor rural agriculture (UNDP; 1996: 228). This is largely because the market structure may be composed of large wholesalers purchasing directly from rural areas or from intermediate, wholesale markets at the edge of the city and supplying retail outlets throughout the city, in which case smaller urban farmers generally do not fit well into this structure.

Some of the reviewed literatures also indicate that loss of vegetables to theft and lack of police protection are among the common problems of urban farmers. This is because urban agriculture, unlike most other industries, produces mostly in the open and is particularly subject to theft as most people passing by have some need for the product.

CHAPTER THREE

Significant Findings of the Research on the Urban Agriculture Activities by Cooperatives and Households

3.1 Characteristics of the representative urban farmers

3.1.1 Gender, age and ethnic composition

Gender involvement ratio on urban agriculture activities varies greatly from city to city, depending on cultural/religious context, the economic conjuncture, the economic activity, the production system, scale and areas involved (UNDP, 1996). In the case of all the three vegetable producers' cooperatives surveyed, men farmers are the highly predominant and sole members of the cooperatives. Among the 90 informants, 65 (72.2%) of them are male while the rest few, 25 (27.8%), were women (Table 1) who only replaced their husbands over the years for various reasons including death, illness, or separation

Table 1. Number and percentage distribution of respondents by sex and cooperative.

	Shankila River	Kebena-Bulbula	Kolfe-Lideta	Total
Male	24 (80.0%)	19 (63.3 %)	22 (73.3%)	65 (72.2%)
Female	6 (20.0%)	11 (36.7%)	8 (26.7%)	25 (27.8%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

Asked during a focus group discussion why men were so predominant in all the cooperatives, all participants from the three cooperatives said that the cooperatives primarily considered ownership of land in accepting members and the women did not have land on their own. This is mainly because, while looking for better income and better survival options for themselves and their family members, it was only the men who became tenants and waged farm laborers, and finally state-land occupiers, after which they formed producers' cooperatives. Yet, most wives of the men cooperative members are also active participants on the privately owned plots although it is solely their husbands who cultivate the common lands of the cooperatives. This is true in all the three cooperatives.

Moreover, organized by an NGO, there are two women's associations of some 30 and 26 members at the Kolfe-Lideta and Kebena-Bulbula respectively. These women, whose husbands are all members of the cooperatives, are involved on their own small-scale backyard gardening. At the time of a focus group discussion conducted with some of these women, participants of the discussion said that while the men dominate the commercial urban food production, the women assist by upholding household food security because such kind of backyard gardening offers women the opportunity to be integrated into other household activities. These women also involve in selling of products produced by themselves and/or their husbands at the local markets.

The age composition of the informants from the three cooperatives is as shown in Table 2. As mentioned earlier, all the cooperatives consider ownership of land in accepting new members into the cooperatives and this partly explains why more or less it is the same people who have been members of the cooperatives and why there are too few or no new members coming to join the cooperatives. Thus the greatest portion of the members, 29 (32.2%), falls in the age category of 45-54 years whereas the youngest age group, 25-34 years, comprises only 3 (3.3%) of the total 90 (100.0%) respondents.

Table 2. Number and percentage distribution of respondents across age and cooperative.

	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
25-34	1 (3.3%)	-	2 (6.7%)	3 (3.3%)
35-44	4 (13.3%)	8 (26.7%)	7 (23.3%)	19 (21.1%)
45-54	7 (23.3%)	12 (40.7%)	10 (33.3%)	29 (32.2%)
55-64	14 (46.7%)	4 (13.3%)	6 (20.0%)	24 (26.7%)
65-74	2 (6.7%)	3 (10.0%)	5 (16.7%)	10 (11.1%)
75-84	2 (6.7%)	1 (3.3%)	-	3 (3.3%)
85-94	-	2 (6.7%)	-	2 (2.2%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

Most of the respondents, as many as 84 (93.3%), are from the Guragie ethnic group, the rest few, 5 (5.6%) and 1(1.1%) being from Amhara and Oromo ethnic groups respectively (Table 3).

Table 3. Number and percentage of respondents by ethnic background and cooperative.

	Shankila River	Kebena Bulbula	Kolfe-Lideta	Total
Guragie	29 (96.7%)	29 (96.7%)	26 (86.7%)	84 (93.3%)
Amhara	1 (3.3%)	1 (3.3%)	3 (10.0%)	5 (5.6%)
Oromo	-	-	1 (3.3%)	1 (1.1%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

Such a highly Guragie dominated ethnic composition is found in all the three cooperatives and although the respondents could not give any specific and logical explanation to this, it was implied during the focus group discussion that the founding members of the cooperatives must have encouraged only people of their own ethnic group (the Guragie) in the rural, to come and join them in the urban farming activity.

3.1.2 Marital status, household size and household members' enrolment in urban agriculture

Among the 90 respondents, 64 (71.1%) are married, 20 (22.2%) widowed, 1 (1.1%) divorced, 1 (1.1%) separated and the remaining 4 (4.4%) single (Table 4).

Table 4. Number and percentage distribution of respondents by marital status

	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Single	1 (3.3%)	-	3 (10.0%)	4 (4.4%)
Married	24 (80.0%)	20 (66.7%)	20 (66.7%)	64 (71.1%)
Divorced	-	-	1 (3.3%)	1 (1.1%)
Widowed	5 (16.7%)	9 (30.0%)	6 (20.0%)	20 (22.2%)
Separated	-	1 (3.3%)	-	1 (1.1%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

The fact that most of the informants are married or widowed partially explains why the majority of them have a large size of household that ranges from one to fifteen, the most common family size being between five and nine (Table 5). This in turn entails that quite a large household members are supported by the urban agriculture.

Table 5. Household size of respondents by cooperative

	Shankila-River	**Kebena-Bulbula**	**Kolfe-Lideta**	Total
1-4	2 (6.7%)	6 (20.0%)	4 (13.3%)	12 (13.3%)
5-9	22 (73.3%)	14 (46.7%)	22 (73.3%)	58 (64.4%)
10-14	6 (20.0%)	9 (30.0%)	4 (13.3%)	19 (21.1%)
15-19	-	1 (3.3%)	-	1 (1.1%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

7.41 persons is the mean household size and a total of more than 667 household members are supported just by these 90 sample city farmers. This being just for the 90 respondents, a statistical data of 2000 obtained from the Addis Ababa Cooperatives Organization and Promotion Bureau shows that a total of more than 1692 household members (1006 by Kolfe-Lideta; 416 by Shankila-River; and 270 by Kebena-Bulbula) is directly or indirectly supported and/or supplemented by the total members of the three cooperatives.

3.1.3 Migration status, educational level and skill other than agriculture

Except 10 (11.1%) of the respondents who for various reasons had migrated to Addis Ababa in the 1980's, the rest 80 (88.9%) are non-migrants (Table 6) who have lived in the area for decades. This figure implies that, in contrast to the common belief of many governments of the developing countries that urban agriculture is the accidental or temporary business of recent migrants, it is not the case in Addis Ababa. This is primarily owing to the fact that new arrivals have less access to land and other resources than long-term residents have had. All the respondents during the focus group discussion agreed that recent immigrants are rarely able to put together all the necessary access to land, water and other inputs. According to some of these informants, new immigrants from the rural areas might also face some problems in effectively adapting rural farming customs and/or systems to the urban environment.

Table 6. Number and percentage of respondents by migration status and cooperative.

	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Non-migrant	26 (86.7%)	27 (90.0%)	27 (90.0%)	80 (88.9%)
Migrant	4 (13.3%)	3 (10.0%)	3 (10.0%)	10 (11.1%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

All the 10 (11.1%) migrants said that when they had found their earlier survival strategies in the rural and urban areas were unsatisfactory, they moved into urban agriculture as a way of improving their situation.

Regarding the educational levels of the respondents, only 9 (10.0%) and 14 (15.6%) of the 90 respondents had received secondary level (Grades 7-12) and primary level (Grades 1-6) education respectively. But of the remaining, 14 (15.6%) were read and write with the majority 53 (58.9%) being illiterate (Table 7).

Table 7. Number and percentage of respondents by educational level and cooperative.

	Shankila River	Kebena-Bulbula	Kolfe-Lideta	Total
Illiterate	13 (43.3%)	21 (70.0%)	19 (63.3%)	53 (58.9%)
Read and write	8 (26.7%)	4 (13.3%)	2 (6.7%)	14 (15.6%)
Elementary level	4 (13.3%)	4 (13.3%)	6 (20.0%)	14 (15.6%)
Secondary level	5 (16.7%)	1 (3.3%)	3 (10.0%)	9 (10.0%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

This reflects that being a relatively easy industry to enter in terms of its educational and technical requirements, urban agriculture has given a job opportunity to a large number of illiterate people.

Asked if they had any skill other than agricultural, only 9 (10.0%) of the 90 respondents in the three cooperatives said yes while the majority 81 (90.0%) responded in the negative (Table 8). This in part explains why almost all the respondents, 87 (96.7%), were full time urban agriculture workers; whereas only 3 (3.3%) of the respondents were involved in the business on a part-time basis (Table 8).

Table 8. Number and percentages of respondents by skill other than agriculture and level of involvement in urban agriculture

	Skill other than agriculture		Total	Major occupation			Total
	yes	no		Urban Farmer	Day laborer	Other	
Shankila River	5 (16.7%)	25 (83.3%)	30 (100.0%)	29 (96.7%)	-	1 (3.3%)	30 (100.0%)
Kebena-Bulbula	2 (6.7%)	28 (93.3%)	30 (100.0%)	30 (100.0%)	-	-	30 (100.0%)
Kolfe-Lideta	2 (6.7%)	28 (93.3%)	30 (100.0%)	28 (93.3%)	1 (3.3%)	1 (3.3%)	30 (100.0%)
Total	9 (10.0%)	81 (90.0%)	90 (100.0%)	87 (96.7%)	1 (1.1%)	2 (2.2%)	90 (100.0%)

3.2 Benefits, Problems and Constraints of the Urban Farming Activities in Addis Ababa

3.2.1 Benefits of the urban farming

3.2.1.1 Nutritional and food security benefits

During the three months time considered for the study, the household members of each informant have consumed the estimated average amount of vegetables shown on Table 9. During a focus group discussion, all the participants also confirmed the fact that urban farming households consume much more fresh vegetables all year round than non-farming households.

Therefore, although an empirical study was not conducted on the neighboring non-farming households for a comparison purpose, it is likely that vegetable-producing households have a relatively better quality, quantity and nutritional balance of food intake. And enhancing the quantity of food available throughout the year reduces the incidence of hunger, while improving the quality of the food fosters a better health and nutrition to the households.

Table 9. Estimated average amount of vegetables that was consumed and wasted by each household of all the informants during the 3 months time (in kgs)

Type of vegetable	Average (mean) amount of consumed and wasted vegetables		
	Consumed (estimated in kgs)	Wasted (estimated in kgs)	Total
Cabbage	39.36 (80%)	9.84 (20%)	49.20 (100%)
Carrot	58.92 (75%)	19.64 (25%)	78.56 (100%)
Lettuce	36.55 (85%)	6.45 (15%)	43.00 (100%)
Potato	93.75 (75%)	31.25 (25%)	125.00 (100%)
'kosta'	77.00 (70%)	33.00 (30%)	110.74 (100%)
Spring onion	52.32 (80%)	13.08 (20%)	65.40 (100%)

Self-production has also increased the food security of the households by making it possible to obtain fresh vegetable food that they could not other wise afford to buy. This is because daily food intake does not depend on their unstable daily income; hence the households have gained a better control over the quantity, quality and stability of their diet. Especially in the case of the female-headed households, urban farming has helped ensure children's access to food and though not clearly seen it also has contributed to the empowerment of women.

3.2.1.2 Income generation and employment benefits

Data collected in the survey suggest that the economic benefits of the urban farming to the households are at least as great as the nutritional and food security benefits. The most important economic benefit of the urban farming for the households is income generation. Urban agriculture in Addis Ababa is providing

vegetables for consumption and also it is generating supplemental or principal incomes to such a large size of household members.

Urban farming has as well enabled many of these households to save a certain amount of their income from the urban farming and/or their other sources of income that would have been spent for buying some food items, especially vegetables. Therefore, besides the directly earned income by selling vegetables, consumption of self-produced food has covered a considerable share of the households' total food intake and this in turn has saved an even larger share of the households' cash income to cover non-food expenses such as health, education, clothing and transportation.

For example, Table 10 below shows the summation of how much each urban farmer earned on average from what he/she had produced and sold during the three months time.

Table 10. Sum of the average income earned by each informant from selling vegetables during the 3 months time (in Birr)

Type of vegetable	Sum of the average income earned by all the informants (in Birr)
Cabbage	44492.53
Carrot	22177.18
Lettuce	18709.25
Potato	32799.10
'kosta'	27795.75
Spring onion	11031.50

Using the figure in Table 10 above, the average income of each household can also be calculated as follow.

$$\frac{(44492.53 + 22177.18 + 18709.25 + 32799.10 + 27795.75 + 11031.50)}{90}$$

$$= \frac{157005.31}{90}$$

$$= \underline{1744.50}$$

The computed amount Birr 1744.50 is the total average income earned by each household during the three months time. From this the average income of each household per month can as well be estimated by dividing the amount into three months and it is about Birr 581.50.

For 67 (76.1%) of the informants, urban farming is the only source of income (Table 11). This implies that city farming in Addis Ababa has provided a significant opportunity for those who are without other source of income to participate in the commercial activity.

Moreover, as a labor-intensive activity, in addition to the heads of the households and their spouses who are in most cases full-time workers on the urban agriculture, their children and other members of the households as well as hired labor are also involved in the urban agriculture on part-time or full-time bases.

This fact suggests that urban agriculture is doing greater absorption of labor by allowing the households to take full advantage of their resources.

Table 11. Number and percentage of informants with or without other source of income than urban agriculture

	Does your household have other source of income than urban agriculture?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes	4 (13.8%)	9 (31.0%)	8 (26.7%)	21 (23.9%)
No	25 (86.2%)	20 (69.0%)	22 (73.3%)	67 (76.1%)
Total	29 (100.0%)	29 (100.0%)	30 (100.0%)	88 (100.0%)

The fact that about 68 (75.6%) of the informants are elderly people of 45 and above years of age, and about 25 (27.8%) were women (see Tables 2 and 1) with children suggests that urban agriculture in Addis Ababa has also been a source of income for old people and women, with limited mobility.

Urban agriculture has also given the opportunity for some to save and reinvest on other non-agricultural urban businesses. In an effort to learn the level of saving among the urban farmers, rather than asking a direct question on how much s/he saved, each of the 90 informants was asked if s/he had an Iqqub which is a common form of saving in Ethiopia. The response was that 17 (19.1%) of them had at least one Iqqub (Table 12) and this implies the potential of saving and investing of money earned from urban agriculture on some other small scale non-agricultural urban business to earn more income. About 21 (23.6%) of all the

informants have already managed to start different sorts of small-scale non-agricultural businesses, using the money they had earned from the urban farming (Table 13).

Table 12. Informants who have Iqqub using money earned from urban agriculture.

	Do you have Iqqub with the money earned from the urban agriculture?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes	7 (23.3%)	5 (17.2%)	5 (16.7%)	17 (19.1%)
No	23 (76.7%)	24 (82.8%)	25 (83.3%)	72 (80.9%)
Total	30 (100.0%)	29 (100.0%)	30 (100.0%)	89 (100.0%)

Table 13. Informants who have started non-agricultural business.

	Have you ever started non-agricultural business with the money earned from UA?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes	6 (20.0%)	8 (27.6%)	7 (23.3%)	21 (23.6%)
No	24 (80.0%)	21 (72.4%)	23 (76.7%)	68 (76.4%)
Total	30 (100.0%)	29 (100.0%)	30 (100.0%)	89 (100.0%)

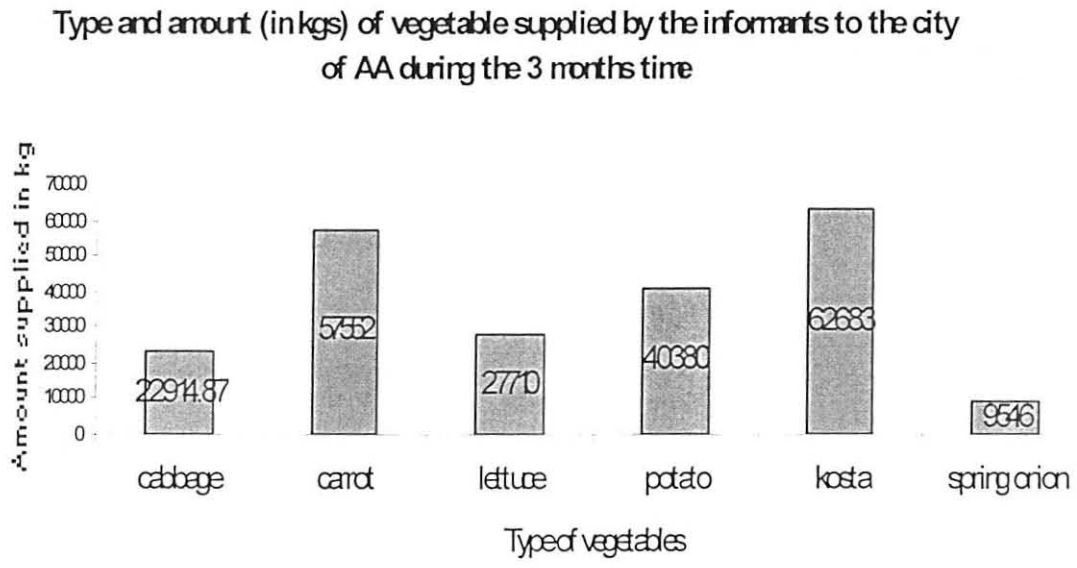
3.2.1.3 Urban food supply and the national agricultural sector

Recent data obtained from the Ministry of Agriculture show that most of the Addis Ababa vegetable demand is supplied by the five vegetable producing cooperatives within the city. This implies that the urban vegetable production is not only contributing to the improved economic and nutritional conditions of the

households and cooperatives actually involved in the production, but also it is offering a variety of macroeconomic benefits to the city inhabitants.

In the urban areas of low-income countries, 40 – 70% of the family budget is spent on food and fuel, with the poorest people in those cities paying 60 – 90% of their budgets (UNDP; 1996; 175). In this regard, the urban vegetable production in Addis Ababa is making a substantial contribution to improve the situation in the city because it is making vegetable products available in the market in a large amount and at a relatively lower price that most low-income urban dwellers can afford to buy.

The following diagram for instance shows an estimate on the average amount of vegetables produced and supplied to the city of Addis Ababa only in a three months time that has been considered for the research.



The indicated amount of vegetables supply in the diagram being just by the 90 informants, one can safely conclude that urban vegetable production by all the vegetable producing households and cooperatives in the city is satisfying a significant percentage of the urban vegetable demand comprising a fair share of the nation's agricultural industry.

The importance of such an urban food production and supply would particularly increase whenever the national agricultural marketing infrastructure fails to catch up with the growth of urbanization and/or when the rural food supply or the national agricultural infrastructure is disrupted because of reasons other than urbanization.

However, this does not mean it has completely displaced the rural food supply. Crops (such as teff, maize, wheat) and fruits (such as banana, orange, papaya) mostly come to the city of Addis Ababa from the rural areas. But vegetables especially carrots, potato, and leafy vegetables such as a variety of cabbages and lettuce mainly come from the urban and peri-urban parts of the city itself complementing and/or supplementing the rural food supply to the city.

3.2.1.4 Economic use of land and environmental enhancement

Urban farming in Addis Ababa is playing a significant role in making an economic use of land. All the cooperatives and private households have put idle

steep slopes along the rivers into productive use. Asked on the quality of the land that they use for the production, 60 (66.7%) of them said that the land was of poor quality and fertility level (Table 14).

Table 14. Level of satisfaction of informants by the quality of their land

	Are you satisfied with the quality of your land?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes I am	2 (6.7%)	2 (6.7%)	4 (13.3%)	8 (8.9%)
Moderately I am	4 (13.3%)	9 (30.0%)	9 (30.0%)	22 (24.4%)
Not at all	24 (80.0%)	19 (63.3%)	17 (56.7%)	60 (66.7%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

It is using such an idle and unbuiltable parts of the city that they all grow food for household consumption and income generation. While doing so they also have maintained the land. The cooperatives and households make use of not only the idle open spaces but also idle water bodies (rivers) that pass crossing the city of Addis Ababa.

Although measuring the extent has been difficult in this research, urban agriculture is contributing towards improving the urban environment in that it is cleaning the air by reducing dust and absorbing pollutants as well as regenerating the soil. This way, urban farming is hence playing an important role in reducing the negative environmental impacts of urban growth in the city.

As learnt from the focus group discussion conducted with selected informants, the environment where these cooperatives are located is of a relatively lower quality and the level of urban services in the areas is very low. As the result of this, the areas would have been used as a dumping ground for the other portion of the city and this would have made the living environment in these areas very much unsanitary and unhygienic that increases the incidence of different respiratory and other diseases. But the urban farming has certainly saved the environment from these possible risks by undeterminable but great extent and hence has improved the environmental health.

Furthermore, not only has urban agriculture turned the unsightly lots into neatly cultivated green areas but also reduced vulnerability of the communities to disasters such as floods and landslides. Respondents also mentioned during the focus group discussion that urban agriculture has helped them free their areas from any antisocial behaviors and enhanced security in their community as they protect their farms.

3.2.2 Problems related to the urban farming

Inspite of its aforementioned benefits to the practitioners and urban dwellers, the practice of urban farming in the city of Addis Ababa is not without some adverse impacts of different nature and magnitude. Among the problems created or caused due to the practice of urban agriculture in the city are production in a polluted city environment and use of agrochemical on vegetables; and the inefficient use of city

land. These actual and potential problems of the urban farming are amongst the findings of the research and each of them is briefly discussed as follow.

3.2.2.1 Production in a polluted city environment and use of agrochemical

One of the most serious problems of urban farming in Addis Ababa that does not at all seem to be taken into account by the producers themselves or other governmental and non-governmental concerned bodies, is the use of highly polluted river water for irrigating the vegetable farms. As mentioned in the literature review part of this paper, water bodies that pass in cities are nearly always prone to fecal pollution and contamination with different chemicals and heavy metals. And the use of such water bodies for irrigating vegetable farms could be hazardous to the health of consumers.

Since the rivers that cross the city of Addis Ababa are the only water sources for these urban farmers, it is these water bodies that are always used for irrigating the vegetable farms. Although it requires further research to determine the level of the contamination, just by looking at them one can tell with confidence that the rivers are highly contaminated with both industrial and human waste. The rivers carry much of the wastewater in the city as solid and liquid wastes are disposed to the rivers from factories, garages, commercials, residential and so on. For that reason it is such a potential cause for a considerable health problem of the consumers and hence it deserves further scientific investigation.

Relatedely, the other possible cause of food contamination is that some of the farmers apply untreated domestic wastes to their farms with the intention of increasing production. Indeed composted organic solid wastes, as well as treated household sewage contain nutrients that are beneficial to agricultural production and have always been used by farmers. However, all the informants said that a waste-control mechanism of any sort by any centralized body has **never** been done for them on the domestic wastes they apply to their vegetable farms. Such an absence of any centralized waste-control mechanism implies that some of the urban farmers can potentially make a discretionary use of inorganic and untreated organic wastes that are accessible to them.

The other potential source of hygiene problem is the fact that for washing the vegetable products, all the informants use the same polluted river water that they use for irrigation. The student-researcher also personally observed while the farmers were washing their vegetable products using the highly polluted river water. Different studies on the case of other cities indicate that when vegetable products are washed with polluted water, the chance of vegetable contamination would highly increase. This is because the edible parts are likely to be directly contaminated when washed with dirt water resulting in a possible harmful health effect on the consumers. Particularly leafy vegetables such as lettuce, if eaten without the proper care being taken might be a cause to some health problems.

But again this requires a further scientific research in order to find out what the exact harmful effects are.

Use of unregulated and possibly excessive amount of agrochemical in the production of vegetables that are highly prone to contamination of chemicals is the other source of concern. All the 90 (100.0%) informants said that they apply fertilizers (Urea and/or DAP) to different extents on both the communal and private plots.

Informants during the focus group discussion gave two major reasons for their intense use of fertilizers in the production of vegetables. The first reason is that they are all market-oriented producers who primarily produce for the market and therefore they need to increase yield. The second reason is that the land is so infertile and exhausted that unless DAP and/or Urea was used intensively, it would not give the required yield. Some of the informants also said that, in addition to the fertilizers, they apply other agrochemical especially different types of pesticides. As learnt from some of the visited private shops of the agrochemical, pesticides such as Thioden on cabbages; Agro-Metalaxyl on potato and Tomato; and Ustilan NK25 on carrots are applied by some of the urban farmers.

Nevertheless, about 44 (49.4%) of the informants including users of pesticides said nobody had assisted them technically or otherwise in their application of the

agrochemical during the three months time (Table 15). This is where the problem lies because without a closer and timely supervision of experts, use of agrochemical by these uneducated farmers can be excessive and/or indiscriminate causing possible harmful residues on the vegetables, which in turn can have negative impacts on the environment and human health. However, this again requires a further scientific study in order to determine the exact nature of the possible negative impact and its extent.

Table 15 Type of assistance provided to urban farmers in the application of agrochemical

	Who assists you in the use of agrochemical?			Total
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	
Nobody	17 (56.7%)	13 (43.3%)	14 (48.3%)	44 (49.4%)
Friends/neighbors	1 (3.3%)	-	-	1 (1.1%)
Relatives	4 (13.3%)	9 (30.0%)	8 (27.6%)	21 (23.6%)
Hired labor	8 (26.7%)	7 (23.3%)	4 (13.8%)	19 (21.3%)
Relatives and hired labor	-	1 (3.3%)	3 (10.3%)	4 (4.5%)
Total	30 (100.0%)	30 (100.0%)	29 (100.0%)	89 (100.0%)

As personally visited by the student researcher during the survey, most if not all, the informant urban farmers do not seem to worry about the hygienic standard of the places at which they temporarily store and package their vegetable products. Therefore, the vegetable products are also susceptible to contamination and spoilage during storage, packaging and transportation to the market places as the

proper care is not taken by these urban farmers most of who have neither the knowledge nor the facilities to do so.

3.2.2.2 Inefficient use of land

A significant amount of urban farming activity is being done by all the cooperatives on a total of more than 1.25% (274 ha) urban land size within the boundary of Addis Ababa (AAMPPO; 1999). Some of these cooperatives such as the Kebena-Bulbula are located at the very center of the city. This raises an important question that whether this vast urban land of Addis Ababa completely occupied by these vegetable farms has been efficiently used to its maximum possible potentials.

Although it has been argued earlier that the urban farmers have used idle steep lopes along the rivers into productive use, the land occupied by some of the informants still has some potential for other even more important non-agricultural urban activities such as constructions. Consequently, about 51 (57.3%) of the informants expressed their fear of eviction from their plots (Table 16) and thus their insecurity.

These land insecured informants came up with various reasons for their fear of eviction amongst which possibilities of request for the land by investors and/or government was the major ones. This implies that, although urban agriculture is benefiting many urban farming as well as non-farming households, quite a large

portion of the land occupied by the urban farmers just for the production of vegetables could also have been used for other urban purposes, as the value of land is highly increasing in the city of Addis Ababa.

Table 16. Respondents who fear a risk of eviction from their respective plots

	Do you fear any risk of eviction from your plot?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes	14 (46.7%)	23 (76.7%)	14 (48.3%)	51 (57.3%)
No	16 (53.3%)	7 (26.3%)	15 (51.7%)	38 (42.7%)
Total	30 (100.0%)	30 (100.0%)	29 (100.0%)	89 (100.0%)

During a focus group discussion, some of the respondents also revealed that there are some urban farmers who have had illegally stretched onto unused public lands. If it so then, the use of such land is not regulated and its economic rent is not paid in which case urban farming is making an inefficient use of city land in terms of both economy and environment.

3.2.3 Major constraints on the urban farming

The potential of urban agriculture in the city of Addis Ababa is constrained by the limitation of various determinant factors. In most cases, the problem of access to the key ingredients that could make the urban agriculture in Addis Ababa successful is not physical but instead administrative. Results of the survey indicate that constraints on the urban agriculture in Addis Ababa can broadly be

categorized into two as (1) constraints on access to inputs and services and (2) institutional constraints.

These constraints on the urban agriculture in Addis Ababa are so important that they deserve a little further treatment with the support of empirical data from the survey results. Therefore, the following few sub-sections will deal with the issue of constraints of urban agriculture in Addis Ababa as investigated in the research.

3.2.3.1 Constraints on access to inputs, services and post-production activities

Input and service constraints

As far as inputs and services are concerned, put in their order of importance, informants mentioned lack of access to credit, fertilizer and technical support as the most important constraints both at the household and cooperative levels (Tables 17, 18 and 19).

Table 17. Lack of credit as a constraint on the work of urban agriculture at household and cooperative levels

	Lack of credit as a constraint at the hhd level			Total	Lack of credit as a constraint at the coop. level			Total
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta		Shankila-River	Kebena-Bulbula	Kolfe-Lideta	
Always	27 (90.0%)	27 (90.0%)	27 (90.0%)	81 (90.0%)	26 (86.7%)	29 (96.7%)	25 (86.2%)	80 (89.9%)
Sometimes	1 (3.3%)	1 (3.3%)	-	2 (2.2 %)	3 (10.0%)	1 (3.3%)	1 (3.4%)	5 (5.6%)
Not at all	2 (6.7%)	2 (6.7%)	3 (3.3%)	7 (7.8%)	1 (3.3%)	-	3 (10.3%)	4 (4.5%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)	30 (100.0%)	30 (100.0%)	29 (100.0%)	89 (100.0%)

Table 18. Lack of input (fertilizer) provision as a constraint on the work of urban agriculture at hhd and coop. Levels

	Lack of input provision as a constraint at the household level			Total	Lack of input provision as a constraint at the cooperative level			Total
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta		Shankila-River	Kebena-Bulbula	Kolfe-Lideta	
Always	16 (53.3%)	12 (40.0%)	21 (77.8%)	49 (56.3%)	18 (60.0%)	14 (48.3%)	22 (84.6%)	54 (63.5%)
Sometimes	6 (20.0%)	7 (23.3%)	1 (3.7%)	14 (16.1%)	9 (30.0%)	10 (34.5%)	3 (11.5%)	22 (25.9%)
Not at all	8 (26.7%)	11 (36.7%)	5 (18.5%)	24 (27.6%)	3 (10.0%)	5 (17.2%)	1 (3.8%)	9 (10.6%)
Total	30 (100.0%)	30 (100.0%)	27 (100.0%)	87 (100.0%)	30 (100.0%)	29 (100.0%)	26 (100.0%)	85 (100.0%)

Table 19. Lack of extension support as a constraint on the work of urban agriculture at household and cooperative levels

	Lack of extension service as a constraint at the household level			Total	Lack of extension service as a constraint at the cooperative level			Total
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta		Shankila-River	Kebena-Bulbula	Kolfe-Lideta	
Always	16 (61.5%)	14 (58.3%)	15 (68.2%)	45 (62.5%)	18 (69.2%)	18 (69.2%)	15 (68.2%)	51 (68.9%)
Sometimes	6 (23.1%)	4 (16.7%)	4 (18.2%)	14 (19.4%)	5 (19.2%)	5 (19.2%)	4 (18.2%)	14 (18.9%)
Not at all	4 (15.4%)	6 (25.0%)	3 (13.6%)	13 (18.1%)	3 (11.5%)	3 (11.5%)	3 (13.6%)	9 (12.2%)
Total	26 (100.0%)	24 (100.0%)	22 (100.0%)	72 (100.0%)	26 (100.0%)	26 (100.0%)	22 (100.0%)	74 (100.0%)

As shown in Table 17 above, informants said that lack of access to credit has been the greatest constraint in their agricultural activities. During the focus group discussion conducted, this was confirmed by the participants who stressed that if they could at least get credit, they would develop a better cash-flow behavior in which they invest during planting season with borrowed funds, and repay from sales after harvest. They also said that they might even accumulate savings from agricultural surpluses in the form of assets such as livestock when credit is not available.

However, since they produce in response to market demand cycles and hence need working capital to manage the production cycle, respondents said that lack of credit for working capital has reduced their capacity to absorb business shocks and survive bad times. They further revealed that lack of credit has constrained them from upgrading their farming technology and improving their agricultural practices or from investing in higher-yield farming systems, such as livestock, poultry and ornamental horticulture.

Any way even though both rural and urban farmers need credit, what makes it more difficult to these urban farmers to obtain credit is the fact that potential creditors do not recognize urban agriculture as a vital business. This as mentioned earlier is due to, lack of sufficient governmental recognition, tenure insecurity, scarcity of data and lack of organized markets and lack of proper

public awareness on the business of urban agriculture that have made the industry an uncertain activity for both private and government lending agencies.

Next to the problem of credit, respondents mentioned availability and cost of inputs such as fertilizers, seeds, pesticides, and equipment as critical constraints in their success of the urban agriculture activity both at the household and cooperative levels (Table 18). Fertilizers, which are the most important inputs for them, are not often readily available to them and even when they do, not at fair prices. Consequently, all the 90 (100.0%) informants from the three cooperatives said they were forced to purchase fertilizers from private firms at what they believe are unfair prices. Some of the informants indicated the reason for this was that their respective cooperatives did not try to find a mechanism to supply their members with these inputs at fair prices.

As shown in Table 19, informants also mentioned lack of extension service as a constraint both at the household and cooperative levels. Asked if they had any contact with any agricultural center during the three months time, only 24 (29.3%) of the informants said yes whereas the larger proportion, 58 (70.7%), responded in the negative (Table 20).

Table 20. Respondents who have had contact with an agricultural center.

	Contact with any agricultural center during the last 3 months?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes	10 (33.3%)	10 (37.0%)	4 (16.0%)	24 (29.3%)
No	20 (66.7%)	17 (63.0%)	21 (84.0%)	58 (70.7%)
Total	30 (100.0%)	27 (100.0%)	25 (100.0%)	82 (100.0%)

The ministry of agriculture offers very few extension services to the urban farmers but according to the informants, the experts from the ministry most of the time contact only the very few members of the committee rather than the majority at the grass-root level who need the services most. Participants in the focus group discussion stressed that even then, because of no training designed specifically of urban farmers, the experts rarely or insufficiently address the exact problems of the urban farmers. Such aspects as marketing, investment management, accesses to credits, waste water treatment, and use of agrochemical were to mention but few of the points mentioned by the informants as necessary for the urban farmers of Addis Ababa but not yet addressed by the extension workers from the ministry of agriculture (Table 21).

Table 21. Number and percentage of those who have had contact with an agricultural center and the type of assistance/information they obtained

Type of assistance and/or information	Shankila-River			Kebena-Bulbula			Kolfe-Lideta		
	yes	no	Total	yes	no	Total	yes	no	Total
Use of fertilizer	8 (80%)	2 (20%)	10(100%)	9 (90%)	1 (10%)	10(100%)	1(50%)	1(50%)	2(100%)
Use of pesticide	3 (30%)	7 (70%)	10(100%)	5 (50%)	5 (50%)	10(100%)	1(50%)	1(50%)	2(100%)
Irrigation technique	5 (50%)	5 (50%)	10(100%)	6 (60%)	4 (40%)	10(100%)	1(50%)	1(50%)	2(100%)
Waste-water treatment	0 (0%)	10 (100%)	10(100%)	2 (20%)	8 (80%)	10(100%)	1(50%)	1(50%)	2(100%)
Soil conservation	7 (70%)	3 (30%)	10(100%)	5 (50%)	5 (50%)	10(100%)	1(50%)	1(50%)	2(100%)
Marketing advice	3 (30%)	7 (70%)	10(100%)	4 (40%)	6 (60%)	10(100%)	0 (0%)	2(100%)	2(100%)
Getting credit	1 (10%)	9 (90%)	10(100%)	1 (10%)	9 (90%)	10(100%)	1(50%)	1(50%)	2(100%)
General advice	10 (100%)	0 (0%)	10(100%)	10 (100%)	0 (0%)	10(100%)	2(100%)	0 (0%)	2(100%)

Grassroots NGOs are in better touch with low-income urban residents than are governmental agencies, international agencies and private firms. And technology transfer and information dissemination in urban farming can better occur through such non-governmental organizations that are both local and international. However, according to the participants in the focus group discussion, none of

these have ever made any contribution to promote the urban farming in Addis Ababa. The only case of an NGO support mentioned by them was that of ENDA-Ethiopia which is to a certain extent assisting some of the cooperatives and individual urban farmers in providing credit, seeds, as well as in organizing women's associations.

This in part is because the concerned government bodies did not make any effort to encourage and create the conducive and enabling environment that brings together the potential supporters and the urban farmers of Addis Ababa.

In relation to extension services, the issue of research on the urban agriculture in Addis Ababa is also noteworthy at this juncture. Urban farmers need different technologies than rural farmers, and not all-rural farming techniques can be easily transferred to the city. For instance in order to determine the type of fertilizer that is best suitable to the soil and availability of water, a study needs to be done. But as indicated by informants this has never been done and the agricultural research, transfer and extension agencies that serve rural farmers usually have not sufficiently included their urban counterparts.

One of the major reasons for this according to the interviewed officials from the ministry of agriculture is the relatively scarce urban specialists in the agricultural research institutions. But informants on their part argue that this is the direct

result of the insufficient attention that the industry has been given by all the relevant research institutes.

Post-production constraints

The research has revealed that urban farmers of Addis Ababa are also handicapped during the post-production phase due to inadequate transporting and marketing facilities both at the household and cooperative levels. About 25 (28.4%) and 31 (34.8%) of the informants said that marketing of products has always been a critical post-production constraint at the household and cooperative levels respectively (Table 22), adversely affecting their urban agriculture activity, particularly their net income from the industry.

Table 22. Marketing of products as a constraint to the urban farming of AA at the household and cooperative levels

	Marketing of products as a constraint at the household level			Total	Marketing of products as a constraint at the cooperative level			Total
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta		Shankila-River	Kebena-Bulbula	Kolfe-Lideta	
Always	7 (23.3%)	8 (26.7%)	10 (35.7%)	25 (28.4%)	8 (26.7%)	9 (30.0%)	14 (48.3%)	31 (34.8%)
Sometimes	21 (70.0%)	12 (40.0%)	13 (46.4%)	46 (52.3%)	20 (66.7%)	13 (43.3%)	11 (37.9%)	44 (49.4%)
Not at all	2 (6.7%)	10 (33.3%)	5 (17.9%)	17 (19.3%)	2 (6.7%)	8 (26.7%)	4 (13.8%)	14 (15.7%)
Total	30 (100.0%)	30 (100.0%)	28 (100.0%)	88 (100.0%)	30 (100.0%)	30 (100.0%)	29 (100.0%)	89 (100.0%)

the five vegetable producers' cooperatives in the city of Addis Ababa have jointly rented.

All the informants stressed that, owing to their deteriorating incomes from the agriculture, the rent of this hall has been too expensive for them to afford. They said, before the rental adjustment by the government they used to pay only Birr 430 per month for it but now after the adjustment all the cooperatives in Addis Ababa are together paying a total of Birr 13,050 per month!

Although the prices of vegetable products from the cooperatives are often quite lower than those of other sources, since the selling place is remotely located from the center of the city, it is difficult for most of the urban population to be able to fulfill their vegetable needs from the urban farmers. It is obvious that the majority of the low-income urban dweller can not afford the transportation costs to go to these market points of the urban farmers on a daily basis.

As disclosed by the informants, smaller urban farmers are additionally facing a marketing problem in that some wholesale merchants are not willing to do business with small individual producers. Only larger urban farmers in the cooperatives are often the operators in selling to the wholesalers. The small and medium scale farmers need but do not have an adequate community based market where they can sell their produce directly. The small farmers' ability to plan is also impeded with inadequate market information

3.2.3.2 Institutional Constraints

Amongst the various institutional constraints that urban agriculture in Addis Ababa is facing, lack of sufficient recognition is the major one. About 27 (30.0%) of the informants said that they do not believe that urban agriculture in Addis Ababa, with all its benefits, is well recognized by the government (Table 23).

Table 23. Perception of informants on the recognition of UA by government

	Do you believe urban agriculture is well recognized by government?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes I do	23 (76.7%)	19 (63.3%)	15 (50.0%)	57 (63.3%)
No I do not	6 (20.0%)	9 (30.0%)	12 (40.0%)	27 (30.0%)
Do not know	1 (3.3%)	2 (6.7%)	3 (10.0%)	6 (6.7%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

About 51 (57.3%) of the informants (see Table 16) even had expressed their fear of eviction from their plots of land. Particularly, informants from the Kebena-Bulbula said they are highly prone to the risk of eviction due to the very location of their farms. There is a public park adjacent to the land of this particular cooperative and according to the informants from the cooperative, the park has made a claim for the land occupied by the urban farming households.

About 31 (34.4%) of the informants think the government has a neutral attitude on the business of urban agriculture in Addis Ababa while 22 (24.4%) of the informants

expressed their belief that the government has a negative attitude towards the industry (Table 24).

Table 24. Attitude of government towards UA as perceived by informants

	What do you think of government's attitude towards urban agriculture?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
It is positive	9 (30.0%)	2 (6.7%)	4 (13.3%)	15 (16.7%)
It is negative	4 (13.3%)	9 (30.0%)	9 (30.0%)	22 (24.4%)
It is neutral	9 (30.0%)	12 (40.0%)	10 (33.3%)	31 (34.4%)
Do not know	8 (26.7%)	7 (23.3%)	7 (23.3%)	22 (24.4%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

About 58 (64.4%) of the informants (Table 25) also said that their respective cooperative is still facing different kinds of obstacles from various external bodies. Asked what external bodies is obstructing the urban farming activity, informants mentioned the kebele, woreda, and city administration levels and even individual persons (Tables 26,27,28 and 29).

Table 25. Informants who have said their respective cooperatives are still facing some sort of problem/s due to external body/bodies.

	Is there any problem to your cooperative now due to any external body/bodies?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes there is	15 (50.0%)	27 (90.0%)	16 (53.3%)	58 (64.4%)
No there isn't	15 (50.0%)	3 (10.0%)	14 (46.7%)	32 (35.6%)
Total	30 (100.0%)	30 (100.0%)	30 (100.0%)	90 (100.0%)

Table 26. The kebele administration as an obstacle to the work of urban farming (as perceived by informants)

	Is the kebele Adm. an obstacle to your urban farming?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes it is	13 (86.7%)	24 (88.9%)	5 (31.3%)	42 (72.4%)
No it is not	2 (13.3%)	3 (11.1%)	11 (68.8%)	16 (27.6%)
Total	15 (100.0%)	27 (100.0%)	16 (100.0%)	58 (100.0%)

Table 27. The woreda administration as an obstacle to the work of urban farming (as perceived by informants)

	Is the woreda Adm. an obstacle to your urban farming?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes it is	4 (26.7%)	7 (25.9%)	3 (18.8%)	14 (24.1%)
No it is not	11 (73.3%)	20 (74.1%)	13 (81.3%)	44 (75.9%)
Total	15 (100.0%)	27 (100.0%)	16 (100.0%)	58 (100.0%)

Table 28. The city administration as an obstacle to the work of urban farming (as perceived by informants)

	Is the city Adm. an obstacle to your urban farming?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes it is	7 (46.7%)	20 (74.1%)	-	27 (46.6%)
No it is not	8 (53.3%)	7 (25.9%)	16 (100.0%)	31 (53.4%)
Total	15 (100.0%)	27 (100.0%)	16 (100.0%)	58 (100.0%)

Table 29. Neighborhood boundary conflicts among individual persons as an obstacle to the work of urban farming (as perceived by the informants)

	Is individual person/s an obstacle to your urban farming?			
	Shankila-River	Kebena-Bulbula	Kolfe-Lideta	Total
Yes it is	9 (60.0%)	7 (25.9%)	2 (12.5%)	18 (31.0%)
No it is not	6 (40.0%)	20 (74.1%)	14 (87.5%)	40 (69.0%)
Total	15 (100.0%)	27 (100.0%)	16 (100.0%)	58 (100.0%)

All the figures in the tables imply that, lack of government recognition and sufficient government protection as well as questionable legality can create a sense of insecurity among some of the farmers and limit their commitment to and investing in the farming or their concern about the long-term condition of the land.

The figures further suggest that the agriculture, food, health, nutrition and environmental policies have not sufficiently included urban agriculture and the

sector's full benefits are not yet fully available to the urban population who seeks nourishment. And in a situation like this, urban farming can be taken by credit, market, and development agents as a relatively high-risk activity.

During a focus group discussion, all the participants also expressed their belief that government could have played an active and positive role in promoting their industry. They disclosed their beliefs that the government could have helped them expand and modernize their farming activities by facilitating credit, easing access to tools and seeds, paying agricultural extension agents and improving further access to land for agricultural use.

The way towards alleviating most of the aforementioned constraints that now work against the urban farming in Addis Ababa, is by increasing government and public awareness on the actual and potential roles of the industry, as well as by sufficiently including the industry in the urban policies of the city. The relevant implications for urban policies, programs and management of urban agriculture in Addis Ababa are considered in chapter IV of this paper.

3.3.3.3 Opinion of Government Officials

In an effort to get the complete picture of the matter, an interview was conducted with some officials from the respective kebeles in which the cooperatives are found. Some

officials from the Ministry of Agriculture and from the Cooperatives' Organization and Promotion Bureau were also interviewed.

All the interviewed government officials disclosed that they were fully aware of all the benefits of urban agriculture to the urban poor and therefore they support the practice of urban farming as long as it is a legitimate one. However, officials from the kebeles alleged that there are some urban farmers who are involved in illegitimate activities of farming on land that has not been officially allocated for that purpose.

They said there are some urban farmers who have had expanded onto unused public or private lands or who have worked out an informal agreement with each other, taking over land planned or set aside by the government for other purposes or intruding on land that should have been conserved for environmental or other reasons. The use of such lands, according to these kebele officials is not regulated and its economic rent is not paid. Therefore, the kebeles have the responsibility to identify and terminate such illegal activities which some of the farmers might wrongly consider as if the kebeles were against the activities of urban farming in the city.

The kebele officials further said that, as far as land tenure is concerned there is an agreement between government and the urban farmers on a temporary ownership of the land and that the latter would leave the area when requested. This in some cases has deprived urban farmers their right of being considered as legitimate residents of the kebele in which they live. They particularly mentioned that the land occupied by the

kebena-bulbula vegetable producers' cooperatives is being justifiably claimed by the public park adjacent to it. But since these farming households need an equivalent size of land for replacement, the claim for the land by the park has not been realized thus far.

In any case, it is the strong belief of these government officials that some thing be done about it because in the absence of formal harmony with the government, the informanlity, illegality and thus the instability of the activity with a possibility of eviction, is not conducive to efficient farming. With low tenure security and questionable legality, the farmer is not motivated either to follow efficient farming practice or to be concerned about the long-term condition of the land, the need to regenerate the soil or the impact of the farming activity on the environment. They also said that such farmers are considered high-risk borrowers by potential credit agencies.

Officials from the Ministry of Agriculture generally commented that the current support of the ministry to the urban agriculture has been so minimal but in the future the ministry has the intention of encouraging and strengthening it with the provision of inputs and better services.

Representatives from the Cooperatives' Organization and Promotion Bureau on their part said that in cooperation with the ministry of agriculture, their bureau is supporting urban agriculture activities in the city specifically by assisting the practitioners to better

organize themselves as well as by giving official recognition to those cooperatives that deserve it.

CHAPTER FOUR

4. Summary, Policy Implications and Recommendations

4.1 Summary

Results from the surveyed sample of vegetable producing urban farmers suggest that the economic benefits of the urban farming to the households are at least as great as the nutritional and food security benefits. And the most important economic benefit is generation of supplemental or principal incomes to the household members.

The fact that about 68 (75.6%) of the informants were elderly people of 45 and above years of age, and about 25 (27.8%) were women suggesting that urban agriculture in Addis Ababa is also a source of income for old people and women, with limited mobility. The study has in addition indicated that urban agriculture has given the opportunity for some to save and reinvest on other non-agricultural businesses to earn even more income. In this regard about 21 (23.6%) of the informants have already managed to start different sorts of small-scale non-agricultural businesses, using the money that they have earned from the urban farming.

These vegetable producers supply most of the Addis Ababa vegetable demand. This implies that the urban vegetable production is not only contributing to the improved economic and nutritional conditions of the households actually involved in the production, but also it is offering a verity of benefits to the non-producing city inhabitants.

Urban farming in Addis Ababa is also playing a significant role in making an economic use of land and water. This is because the cooperatives and households have put an idle and mostly unbuiltable part of the city as well as idle water bodies into productive use.

Outcomes of the study on the other hand indicate that, the practice of urban farming in the city of Addis Ababa is not without some adverse impacts of different nature and magnitude. One area of concern according to the study is that since the rivers that cross the city are the only water sources for these urban farmers, it is these water bodies that are always used for irrigating the vegetable farms. However, these rivers are highly contaminated with different chemicals and heavy metals that could possibly be hazardous to the health of the vegetable consumers. This is because the rivers carry much of the wastewater in the city and there is no any water treatment mechanism done by the farmers or any other centralized body.

The other source of concern according to the survey is use of unregulated and possibly excessive amount of agrochemical in the production of vegetables that are

highly prone to contamination of chemical. Again this, according to the survey, is because there is no closer and timely supervision of experts in the applications of agrochemical by the urban farmers.

Potentials of urban agriculture in the city of Addis Ababa are in turn constrained by the limitations of various determinant factors. Results of the survey indicate that constraints on the urban agriculture in the city can broadly be categorized into two as constraints on access to inputs and services, and as institutional constraints.

As far as inputs and services are concerned, put in their order of importance, informants mentioned lack of access to credit, fertilizer, and technical support as the most important constraints both at the household and cooperative levels. Particularly lack of access to credit has always been a constraint in their agricultural activities because potential creditors do not recognize urban agriculture as a vital business. With regards to the institutional constraints, the informants have mentioned lack of sufficient legal recognition of the urban farming as the most important one.

The overall results of the study collectively imply that government support for research and development, provision of extension workers, inputs and credit facilities are critical factors in the improvement of productivity and in the successful development of urban agriculture in general and vegetable production in particular. These and other related issues would be discussed further in the following section.

4.2 Policy Implications and Recommendations for Promoting Urban Agriculture in Addis Ababa

In labor-rich but capital and energy poor country such as Ethiopia, urban agriculture should be encouraged, strengthened, and given its rightful place, not merely tolerated. However, urban development planning has neglected urban agriculture over the years and presently there is no stated policy regarding urban agriculture in Ethiopia. This has led to lack of supportive services to the sector.

Outcomes of this research have revealed that one of the greatest obstacles for the urban farmers is lack of access to credit. With the existing financial structure of the country, credit can be provided only if a cooperative is legalized. Therefore it is important that urban managers make an effort to understand the actual and potential benefits of urban agriculture in the city and based on an appropriate study, try to take responsibility for legalizing all the producers' cooperatives.

Once the producers' cooperatives are legally recognized, there are some possible means of increasing the amount of credit available to the urban farmers. These possible means can include (a) providing a special line of credit for urban farming entrepreneurs, (b)reserving part of an existing agricultural credit quota for urban farmers and, (c) including urban farming among the industries eligible for special small enterprise support.

Results of the research also indicate that the existing structures of the urban farmers need to be supported by extension workers' technical assistance and training. Modern agricultural production techniques can only be developed through such a technical assistance of experts from the Ministry of Agriculture and other concerned agencies through extension workers. But, this needs a special coordination or an integrated development scheme at the city level so that an organized body of experts could be involved in training, researches, follow-up, and advice to the urban farmers in improving their agricultural productivity and management of farms.

Particularly the training aspect should basically focus on the production and business training for farmers with special emphasis to address the urgently needed issues such as wastewater treatment, proper use of agrochemical, packaging, storing and marketing of vegetables. In addition to the assistance from experts, such a training in urban agriculture can best be accomplished by the farmers themselves. In this way, a farmer who is proficient in a best practice can pass his skill and knowledge directly to another farmer.

Researches on the productivity of urban agriculture need to be expanded, and the possibilities for improvements in tackling plant diseases, identifying disease-resistant plants, developing new seeds, increasing yields, improving soil conservation methods, and developing other environmental methods also need to be investigated.

Vacant land might not often be available in the city of Addis Ababa. But based on the identification of the needs of the population, the available sites that are unsuitable for construction (or where it would be too expensive) could be allocated by the planning departments to compatible uses including urban agriculture. Mainly the riverbank and other peripheral areas of city, which are usually used as garbage damping areas, could be used for urban agriculture. But yet feasibility of such an allocation should consider costs such as transportation and other infrastructures. This is because the more distant the production area, the more difficult to transport the product to the points of sale and hence the more expensive the products would be.

The other important concern is that surveys on urban agriculture need to be conducted in order to generate data on the current state of the industry as well as projection of its future potentials. Surveys are also needed both to convince investors, supporters and promoters of the benefits of urban agriculture and as input into the process of formulating policies and interventions for this sector. The impact of future interventions can be measured against this baseline data and for that reason, data are specifically needed on: the extent of urban agriculture, the structure of the sector, demand and supply, input and output market and links, efficiency of the production activity, technologies and farming system mix, nutritional and health impacts of farming, environmental impacts and the like.

The specific types of surveys needed are therefore baseline surveys and farming system surveys, both of which reveal the current status and extent of farming in the

city. **The baseline survey** could include a land survey to establish which parts of the city are currently farmed and which could be farmed. It could also include a market survey and a household survey to establish the percentage and type of residents who are farming as well as details about the farming activity.

The farming system survey on its part identifies the production process, producers, technologies, inputs, markets, linked sectors (input and output industries, credit agencies, extension and research agencies), beneficiaries and ecological, economic and social impacts. Such surveys are needed to define the existing and potential benefits, as well as the needs (research, credit, and so on) of each farming system.

To conclude, findings of the study from the selected cooperatives and households show that, given the determination and willingness of the household members to cultivate, plus the availability of land and water, a minimum capital requirement, locally earned technology and official consent, the urban low-income population would take any opportunity to produce its own food and improve its socioeconomic position in the city. Nevertheless, there is no doubt that government support for research and development, provision of extension workers, inputs, and credit facilities are also critical factors in the improvement of productivity and in the successful development of urban agriculture.

References

Addis Ababa Master Plan Project Office (AAMPPO). 1998.

_____ 1999.

Aldington T. 1997. *Urban and peri-urban agriculture: some thoughts on the issue.* Land Reform, Land Settlement and Co-operatives 2: 43-44.

Amuzu AT and Leitmann P. 1992. *Environmental profile of Accra case study.* Prepared for the Urban Management and Environmental Component of the UNDP/world Bank/UNCHS Urban Management Program.

Binns T and Lynch K. 1998. *Feeding Africa's growing cities into the 21st century: the potential of urban agriculture.* Journal of International Development 10: 777-793.

Bowyer-Bower T and Drakakis-Smith D. 1996. *The needs of the urban poor versus environmental conservation: conflict in urban agriculture.* London: Research Report, ODA Project R5946.

CENCOSAD. 1994. *Urban market gardens in Accra.* Accra: Center for community Studies, Action and Development, and mega Cities Project.

Deelstra T. 2000. *Urban agriculture and city ecology.* Paper presented at growing cities growing food workshop, Havana, Cuba, October 1999.

Drescher A. 1998. *African home gardens: self-management of sustainable production systems and strategies of food security in Zambia and Zimbabwe.* Pfaffenweiler: Centaurus.

Drescher, A.W. and D. Iaquinta 1999. *Urban and peri-urban Agriculture: A new challenge for the UN Food and Agriculture Organization (FAO).* FAO – Rome.

FAO (1998): *Majority of people lives in cities by 2005.* Web Page Information FAO: http//www.fao.org/NEWS/FACTFILE/FF9811-E.HTM.

FAO-COAG (1999): The "COAG – Paper". Report of the coag Secretariat to the COAG. FAO, Rome.

Foeken D and Mwangi A. 2000. *Increasing food security through urban farming in Nairobi.*

G. Egziabher A, Memon PA, Mougeot L, Lee-Smith D, Maxwell D and Sawio C. 1994. *Cities feeding people: an examination of urban agriculture in East Africa.* Ottawa: IDRC.

Gumbo DJ and Ndiripo TW. 1996. *Open space cultivation in Zimbabwe: case study of Greater Harare, Zimbabwe.* African Urban Qurban agriculturerterly 11 (2-3): 210-216.

Jacobi. P., J. Amend and S. Kiango (2000): *Urban Agriculture – a case study of Dar es Salaam (Tanzania).* In: City Harvest – a Reader on Urban Agriculture, GTZ, Eschborn.

Klemesu M. 2000. Urban agriculture and food security, nutrition, and health.

Losada H, Martinez H, Vieyra J, Pealing R and Cortes J. 1998. *Urban agriculture in the metropolitan zone of Mexico: changes over time in urban, suburban, and peri-urban areas.* Environment and Urbanization 10 (2): 37 – 54.

Lourenco-Lindell I. 1995. *Food for the poor, food for the city: the role of urban agriculture in Bissau.* Paper presented at ODA Workshop on The Social and Environmental Implication of Urban Agriculture, University of Zimbabwe, Harare, 30-31 August 1995.

Maxwell D and Armar-Klemusu M. 1998. *Urban agriculture: introduction and review of literature.* Accra: Noguchi Memorial Institute for Medical Research.

Mbaye, A and P. Moustier (2000): *City Harvests: Urban Agriculture in Dakar (Senegal).* In: City Harvest – a Reader on Urban Agriculture. GTZ, eschborn.

Mbiba B. 1994. *Institutional responses to uncontrolled urban cultivation in Harare: prohibitive or accommodative?* Environment and urbanization 6 (1): 188-202.

Mbiba B. 1998. *Urban agriculture policy in Southern Africa: from theory to practice.* In: Productive open space management with a shared focus on the potential of urban agriculture (urban food production) policy and agenda 21. International Conference, Pretoria, 3-5 March 1998.

Mougeot, L. (2000): *Urban agriculture: Definition, Presence, Potentials and Risks, and Policy Challenges.* Paper presented to the International Workshop "Growing Cities, Growing Food", October 11-15 1999, Havana, Cuba.

_____. 1994. *Urban food production: evolution, official support, and significance.* Cities feeding People Series Report 8. Ottawa: IDRC.

Moustier P. 1998. *On the performance of urban vegetable supply in African countries.* Acta Horticulturae 340: 307-313.

Mwangi AM. 1995. *The role of urban agriculture for food security in low-income areas in Nairobi.* Leiden: African Studies Center.

Nelson T. 1996. Closing the nutrient loop. World Watch (November/December).

Ogden C. 1993. *Urban malnutrition: maternal activities and child nutrition in Kigali,* Rwanda. Unpublished PhD. Thesis, Cornell University.

Population and Housing Census of Ethiopia (PHCE) (1994): Vol. II.

Richter J, Schnitzler WH and Gura S (eds). 1995. *Vegetable production in periurban areas in the tropics and subtropics*: food, income, and quality of life proceedings of an international workshop, zschortau, 14-17 November 1994.

Sachs, Ignacy, and Dana Silk. 1990. *Foods and Energy: Strategies for Sustainable Development.* Tokyo: United Nations University Press.

Sanyal B. 1985. *Urban agriculture: who cultivates and why?* Food and Nutrition Bulletin 7 (3): 15-24.

Sawio C. 1993. *Feeding the urban masses?* Towards an understanding of the dynamics of urban agriculture in dar es Salaam, Tanzania. Clark University.

Smit J, Nasr J and Rattu A. 1996. *Urban agriculture: a neglected resource for food, jobs, and sustainable cities.* New York: UNDP.

Stevenson C, Xavery P 8 Wendeline A. 1996. *Market Production of fruits and vegetables in the peri-urban area of Dar es Salaam.* Tanzania, Dar es Salaam: Urban Vegetable Production Project.

UNDP (1996): *Urban Agriculture: Food, Jobs and Sustainable Cities.* United Nations Development Program, Publication Series for Habitat II, Volume One. UNDP, New York.

Wade I. 1986. *City Food: Crop Selection in third world cities.* San Francisco: Urban Resources Systems.

WRI (1999): *World resources 1998-99: The Urban Environment.* World Resource Institute,WashingtonDC.

Zakariah S, Lamptey GM and Maxwell D. 1998. Urban agriculture in Accra a descriptive analysis, in: Armar Klemasu M & Maxwell D (eds), Urban agriculture in the Greater Accra Metropolitan Area: report to IDRC. Legon: NMIMR.