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**Addis Ababa University**  
**School of Graduate Studies**  
**College of Development Studies (CDS)**

**Contributions and Challenges of Urban Agriculture. The Case of Vegetable and dairy farming in Addis Ababa**

**By: Teferi Abuhay**

**January, 2009**  
**Addis Ababa**

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By: Teferi Abuhay

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**ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES**

**COLLEGE OF DEVELOPMENT STUDIES  
(CDS)**

*Title*

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Case of Vegetable and Dairy Farming in Addis Ababa.*


**By  
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**DEVELOPMENT STUDIES**

APPROVED BY THE BOARD OF EXAMINERS:

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## Abbreviations

CSA: Central Statistics Authority

FGD: Focus Group Discussion

IPS: Industrial Projects Service

: Key Informants Interview

MGS-VPMS: Mekanisa Gofa Saris- Vegetable production and Marketing Service  
Cooperative

NSLSC: Nifas Silk Lafto Sub-City

AEP- Adult-equivalent person

TMPMS: Tenachin Milk Production and Marketing Service Cooperative.

UA: Urban Agriculture

SPSS: Statistical Package for Social Sciences

## Abstract

*This study was conducted with the objective of identifying the benefits and constraints of vegetable production and dairy farming in people's (farmers') livelihood. With that in mind, the study purposively used two cooperatives, Mekenisa Gofa-Saris Vegetable Producers and Marketing Service cooperative (MGS-VPMS) and Tenachin Milk Producers and Marketing Service Cooperative (TMPMS) in Nifas silk lafto sub-city.*

*The study employed both qualitative and quantitative methods. In one hand, a household survey was conducted on 70 vegetable producers and 30 dairy farming households based on stratified simple random sampling. On the other hand, Focus group discussions, case studies and key informants interview have also been used to get an all rounded information and data. Moreover, secondary data was also obtained from various sources. Following, the data gathered from the qualitative method was analyzed using triangulation; and in the mean time, descriptive and bivariate statistics were used to analyze the quantitative data. The study found out that the household engagement in vegetable and dairy farming production depends on the household's inspiring element. Majority of the farmers from both categories indicate that their reason for engagement were for the dual purposes of income generation and for food consumption. The study further revealed the fact that vegetable production as well as dairy farming gave them the opportunity to be employed, which in turn ameliorated the livelihood problems of the farmers. Dairy farming has given benefit of income generation, food supply, employment and strong social ties with neighbors and relatives. Moreover, more than three fourth of households who engaged in vegetable production and nearly ninety percent of households who engaged in dairy farming have indicated their improvement in food security status. The study also showed that vegetable production has some obstacles that hinder the realization of its full potential. These are: land ownership, land size, market, inputs (hoe, fertilizers, and improved seeds), policy related factors, extension service and health problems. Dairy farming on the other hand faced challenges like: fodder, space, animal disease, lack of capital, and death of animals. The study concludes that with the use of effective measures it is possible to curtail undesirable results and to promote better improvement in the livelihood of the household in the studied cooperatives.*

## **Chapter One: Introduction**

### **1.1. Background of the study**

Although Urban Agriculture (UA) is emerging as an important economic activity within the urban informal sector both in developed and developing countries, attitudes towards UA are mixed (Rabinovitch & Schmetzer, 1997).

To the mainstream urban economists and planners, urban agricultural activities unequivocally contradict the common image of a city. To the traditional urban planner, the architect, the politician and other decision makers, UA detracts from the images of the ideal, planned and modern western city. As a result many people perceive UA negatively. To many it is a remnant of an outmoded, transitory activity typical of rural living where people handle dirt (Sawio, 1993).

Yet studies on UA are showing that the practice of UA is becoming almost a permanent feature in the Third World as well as in developed countries (Nasr, 1992; as cited in Sawio, 1993). It is undisputable that UA is being practiced in cities and their surroundings and much must be known about the activities because it is potentially a socio-economic survival and livelihood-enhancing strategy for the urban poor. It is an innovative response of urban dwellers to the deteriorating national political economy and it has been fostered by the availability of unused open space (Mosha, 1991; Maxwell & Zziwa, 1992) and it makes use of resources in urban ecosystems which otherwise would go to waste (Sawio, 1993).

UA in its nature appears to expand during economic crises, such as by those induced by armed conflicts and structural adjustment, highlighting its use as a coping mechanism. UA contributes to food availability in cities and therefore to the diet of urban consumers. It also serves as an income generating mechanism for urban households involved in producing, processing, marketing and distributing of these foods, allowing them to buy food and face other expenses. In short it contributes to household food security and nutrition. On the other hand, negative health impacts - in particular linked to poor food quality - may have a detrimental effect on nutrition (Egal et al, 2003).

Like any city in Ethiopia, Addis Ababa, where more than half of the participants are considered to lie below the poverty line, many people practice UA as an economic activity in order to generate income and enhance food security at the household level.

In order to overcome the problems associated with UA the city Government of Addis Ababa (CGAA) has established the Urban Agriculture Department under the Trade and Industry Development Bureau to support well organized urban agricultural activities in the city. The CGAA agricultural unit has been given the mandate to promote and develop agriculture in Urban and Peri-Urban areas of the City by thoroughly examining their resource potential.

## **1.2. Statement of the problem**

In Africa issues like poverty, food insecurity and malnutrition were viewed for decades as largely rural problems (Maxwell & Zziwa, 1992). Today urbanization is increasing at an alarming rate. A report of the World Bank (1989: as cited in UN, 2004) anticipates that, by the year 2025 the urban population of sub-Saharan Africa will be growing at a rate of 6.9% per annum as compared to 3.1% of the total population of the region. Consequently, in 25 years time about 55% of the region's people will live in towns and cities compared to 30% currently (UN, 2001). However, the urbanization of the continent does not mean that it will bring economic opportunity and food availability for the majority of Africans. On the contrary, global poverty is becoming more African, more urban and more feminine. Fifty percent of the world's poor and 40 percent of Africa's poor live in urban areas and this poverty makes them incapable of meeting their food needs (Rabinovitch & Schmetzer, 1997). In the capital of Ethiopia for instance about 50% of the total population is assumed to live below the poverty line (IPS, 2007). Which in turn alienate their basic right that to have food and nutritional security. Particularly, in severe economic crisis situation where there is soaring food price the need for additional income generating activity is needed to meet the basic needs.

The presence of great population pressure in and around cities of sub-Saharan African coupled with the economic crisis has led to a tremendous increase in the total city area under food production in the last decade (Mougeot, 1999). In line with this in Addis

Ababa 58% of the population increase is resulted from rural urban migration, which can create a huge burden to both the formal and informal sector of the economy (IPS, 2007). Thus, the new migrants who failed to secure jobs in the formal sector they engaged in urban agriculture to meet their food need, income generation and employment. However, people who are engaged in UA able to get income, employment and meet their consumption need. The activities were not recognized by government rather it has been relegated by policy makers, and most researchers. That instigated me to undertake this study in support of UA in relation to its benefits and challenges.

The study conducted by Axumite (1994) indicated the importance of UA for the producers and urban consumers by of the cooperative-Mekanissa, Furi, and Saris Producers'. However, its benefit needs to be studied at different times for pattern of benefit may change. Thus, this study completes the time dimension benefit of the producers. The study also explores the challenges of UA which were not considered in previous studies. In addition the study explores the challenges and contribution of dairy farming, which had not been studied by other scholars that the author comes across.

### **1.3. Objectives of the study**

**General objective:** The over all aim of the study is to systematically examine the benefits and challenges of urban agriculture in Nifas Silk Lafto Sub-city in Mekenisa, Gofa-Saris Vegetable Producers and Marketing Service cooperative (MGS-VPMSC) and Tenachin Milk Producers and Marketing Service Cooperative (TMPMSC).

**Specific objectives:**

- a) To identify the contributions of vegetable production and dairy farming to producers in the study area.
- b) To identify the challenges of vegetable producers and dairy farming in the study areas.

### **1.4. Research questions**

With the aim of addressing general and specific objectives of the study, this research will be guided by the following specific questions:

- a) What is the income contribution of vegetable production and dairy farming to producers in the study area?
- b) What is the employment contribution of vegetable production and dairy farming to producers in the study area?
- c) What is the food security contribution of vegetable and dairy farming to producers?
- d) What are the input, market, land ownership, policy related, health and environment challenges that vegetable and dairy farmers faced?

### **1.5. Scope and limitation of the study**

This study is delimited to Nifasilk Lafto Sub-city by purposely sampling Mekenisa, Gofa-Saris Vegetable Producers and Marketing Service (MGS-VPMSC) and Tenachin Milk Producers and Marketing Service Cooperatives (TMPMSC).

During the course of the research, the researcher has come across a number of limitations. One of such challenges was a lack of relevant and related research works to be reviewed and discussed in light of the findings. Furthermore at first, most of the respondents were not willing to give their responses to the questions they were asked.

### **1.6. Significance of the study**

The findings of this study will be useful in many ways. To begin with, it provides baseline data on the contributions and challenges of vegetable producers and dairy farming. It will also serve in the future as the spring board for further studies and show how local government bodies in particular, development practitioners and policy makers in general intervene to facilitate development intervention. Lastly, the result of the study can also contribute in building a knowledge base for the academia, research, by providing empirical evidences

### **1.7. Organization of the thesis**

The thesis is organized into five chapters. Chapter one introduces the research topic by starting with a general background of the study. Chapter two reviews the literature, chapter three describes the study area and methodology of the study used. Chapter four presents results and discussion, and chapter (five) gives conclusion and policy implications of the study.

## **Chapter Two: Literature Review**

### **2.1. Definitions and concepts**

#### **2.1.1. Urban agriculture**

Literature on urban agriculture is limited though the practice of UA has been in existence since ancient civilization and the establishment of the first towns and cities. Vennetier did the first study of urban agriculture in sub-Saharan Africa in 1958 in Ponte-Noire Congo (Mougeot, 1999:07).

Although authors differ on defining UA, the following key features characterize the activity. (1) Urban agriculture involves crops and livestock production, but it may also include agro-forestry and fuel production. (2) Urban agriculture is practiced both within the urban boundary and its periphery (Mougeot, 1999). Barrows & Kisamba-Mugerwa (1989) define urban agriculture as the practice of crop cultivation and livestock raising within the boundaries or the immediate periphery of a city. Nevertheless, the above definition lack clarity and particularity of UA activities. For instance it does not specifically tell what types of livestock are included as UA activity. In addition, it fails to show the basic resources that the producers utilize in their production. For example, the water that the crop producers are using and other inputs of crop and livestock production.

The choice of what to produce and how to produce it is determined by the culture, traditions, market, water supply, rain-fall, and climate, exposure to sun, soil condition, plot size and distance from home. Family and individual resources, land availability and location are critical determinants of the type of UA practiced. Thus, the definitions of UA need to accommodate these versatile dimensions (UNDP, 1996).

Accordingly, UNDP (1996) defines UA as an industry that produces, processes and markets food and fuel, largely in response to daily demand of consumers within a town, city or metropolis, on land and water. UA activities are dispersed throughout the urban and peri-urban area, applying intensive production methods, using and recycling natural resources and urban wastes, to yield a diversity of crops and livestock. However, this definition still fails to show the competition that the participants in UA have with the urban expansionist and the challenges that UA faces.

Accounting for the broader needs of the urban population, CEDAR (1999) states that: Urban and Peri-Urban Agriculture is agricultural practices within and around cities which make use of land, water and energy which could be used for other activities to the benefit of the urban population. Horticulture, livestock, fodder and milk production, aquaculture, and forestry are the major components of Urban and Peri-urban Agriculture. However, this definition lacks to show where the end product is directed.

A more integrated definition is given by Mougeot (1999:8) which is used as the working definition for this study: "Urban Agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, an urban centre, a city or metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, reusing mainly 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, while competing resources with other activities".

A broad understanding of urban agriculture must take into account the various activities of households to achieve food security, and to create income. Urban food production is more than food production. Community-based and individual food production in cities meets the needs of the urban population and sustainable urban development and environmental protection (CEDAR, 1999).

Urban food production is practiced by large parts of the urban population in developing countries, and it appears in various forms. However for this study Urban Agriculture refers to only the vegetable and dairy production.

UNDP (1996) explained the inputs used by urban agriculture and its output as follows: urban agriculture uses resources (organic waste), technical services (extension, financing, transportation) products (agrochemicals, tools, vehicles) found in urban areas. This practice in turn generates resources (green areas, microclimate and compost) services (catering, recreation, therapy) products (flowers, poultry, crops, horticulture and dairy) largely for the urban people.

## **2.2. Trends of urban agriculture**

Archaeological findings proved that there were agricultural activities in and around the cities of ancient civilization. City life started thousands of years ago in different parts of the world. Examples of large cities in ancient time include Baghdad, which was home to more than one million people thousands of years before (Mougeot, 1999).

In those ancient cities agriculture was carried out for various purposes for instance for food fodder, building materials, medicinal plants etc (Mougeot, 1999).

So, both city life, and practice of urban agriculture are by no means new developments. Nevertheless, the main difference between ancient cities and the current cities is the scale. Urbanization has been accelerated since the industrial revolution in Europe and North America. Since the second half of 20<sup>th</sup> Century there has been rapid urbanization process (movement from rural areas to urban areas). This massive urbanization has also caused urban agriculture to expand in developing countries (UN, 2001).

## **2.3. Recent developments in thinking about urban agriculture**

There has been improvement recently in understanding UA and its contribution in Africa, Latin America, and Asia. Many city administrators have started to find positive ways to accommodate urban agriculture (Drakakis-Smith, 1990).

The UN (2001) underscore that UA is the common future of people and highlighted for the first time its potential as a tool for sustainable development.

In Africa some organizations have emerged recently to launch programs in support of UA. Examples include: French-speaking network for UA in west and central Africa

coordinated by Institut Africain Digestion Urbaine(IAGU). Another organization is in East and Southern Africa. Urban agriculture programme of the Municipal Development Partnership for Eastern and southern Africa (MDP-ESA) (UN, 2001). The foundation of such institutions has helped to make it possible for UA to emerge as a strategy for combating food insecurity and poverty.

#### **2.4. Actors in urban agriculture**

Studies show that people at different levels of income are involved in urban agriculture. The urban poor are engaged in it for survival, while some middle income groups may be engaged in it for commercial purpose. So, urban agriculture has an important contribution to make for people at different levels of income (UNDP, 1996).

The empirical evidence from Sub-Saharan Africa indicated that in Kenya 56% of urban agricultural producers are recorded to be female farmers in all six towns, the report also notes that the proportion rises to 62% in the larger cities (Lee-smith, 1994). Of these women farmers, 64% are heads of households, a fact that illustrates how critical UA is to the survival of poor families. In Dar es Salaam, 65% of the women farmers are between the ages of 26 and 45, when their obligation to feed their families is most acute. In contrast, over 30% of the male farmers were over 56 years old, perhaps indicating that they lived alone (Foeken et al, 2004). Among cooperative members in Addis Ababa, the head of household as the sole member of the cooperative cultivated the communal plots whereas private plots were the responsibility of the woman (Axumite, 1994).

In addition, Cofie et al (2003) stated that urban farmers are not recent migrants; land pressure is such that new arrivals have less access to land than longer-term residents. Further, a large percentage of the farmers might be called the new poor: white collar workers, even mid-level bureaucrats, with larger house plots (Maxwell, 1994).

#### **2.5. Types of urban agriculture**

Some examples of urban agriculture are: Fish and other aquatic products harvested from tanks, ponds, rivers sewage lagoons, and estuaries. Horticulture on excess variant spaces

at large facilities principally dedicated to other activities (for example: airports, large factories). Rabbits, Guinea pigs, chickens raised in bookshelves of cages hanging on walls. Vegetables grown in hydroponics solutions on roofs, patios, stairways. Market garden on vacant plots, in the green wedges between urbanized corridors or along highways (UNDP, 1996).

## **2.6. Misconception of urban agriculture**

Because of culture planning and policy biases, urban agriculture has been an ill understood industry. It is often minimized as being merely “kitchen gardening” or marginalized as a left over of rural habits; The UNDP (1996) summarized these misunderstandings of urban agriculture as follows.

- i) It is understood as household and community gardening undertaken for food, income and nutrition, but urban agriculture has a much more benefits than these.
- ii) It is considered a temporary or transitional activity.
- iii) It is considered as a marginal activity or means of survival (food) though most of the time it is beyond that.
- iv) It pre-emptes “higher” land use and cannot pay full land rent, but it utilizes land that is misused and unsuitable for other purposes
- v) It competes with and is less efficient than rural farming. It negatively affects incomes of rural farmers, but it thrives on products that are less suited to rural production or that might otherwise be too costly for many urban poor.
- vi) It is unhygienic and generates health problems; inappropriate use of fertilizers, pesticides, untreated waste products leads to food contamination.
- vii) It causes pollution and damages the environment; it pollutes urban soil, water and air.
- viii) It is unsightly and aesthetically inappropriate in the city.
- ix) City gardens are old-fashioned and utopian concept that can not be created today

## **2.7. Empirical studies on urban agriculture**

### **2.7.1. Contributions of urban agriculture**

Urban agriculture has a crucial role to play in solving the problems of rapidly growing cities in developing countries. Due to rapid urbanization, the population in urban areas has increased dramatically in developing countries since the second half of the 20<sup>th</sup> century. One major outcome of this rapid urbanization is expansion of urban poverty which can be manifested in different ways (UNDP, 1996).

According to recent estimates this urban poverty is predicted to grow to 50% by the year 2020 with nearly this entire growth taking place in the world's less developed countries (UN, 2001).

If properly implemented, UA can significantly contribute to solving urban poverty in different ways. In a broad term UA is an interesting option as it contributes to the aggregate supply, in particular, of fresh and perishable plant and animal food, as well as to food production at home for home consumption and better nutrition (Cofie et al, 2003).

#### **2.7.1.1. Food supply**

UA can help resolve the problem of food shortage in urban areas. Although the actual contributions are very little known to food supply at a town level, indicators from Dar es Salaam suggested that urban horticulture plays a vital role for the supply of leafy vegetables. An estimate of 50 to 60 million kg of leafy vegetables is produced annually within the city's boundaries and another 25 million kg of non-leafy vegetables in Dar es Salaam's peri-urban areas (Foeken et al, 2004).

UA can also improve the nutritional level of urban poor. This has been the case in Ethiopia where households in urban areas practice agriculture to solve the problem of food shortage (Axumite, 1994). It may be unrealistic to expect cities to be self sufficient in food as most cereal crops can be grown efficiently in rural areas. But UA has an important contribution to make food security in many major cities. According to UNDP (1996) estimation nearly 800 million urban farmers are engaged in it. In addition, about 15% of the world's food is expected to be generated from UA (Smith, 2002). A recent

publication by the UN (2004) concludes that the poor often diversify their income sources and one of their strategies is engagement in UA. That helps the urban poor to have food security (Anton, 1993).

For the households involved in urban farming means an additional food source besides the food that is purchased. In most instances, the need for food is the major motivation for home garden produce (Bowyer-Bower et al, 1996). However open space users are producing for sale (Foeken et al, 2004). In his study Sawio (1993) indicated that half of his household survey respondents indicated that urban farming provided them 20 to 30% of their food supply. For those who keep livestock, milk, egg and meat contribute to the household's food supply, though for most of them income generation is primary purpose than supplying food.

In many instances, an additional motive for the production of vegetables is the need to have a balanced diet. For example women in Nakuru in Kenya district tend to cultivate more than men (Foeken et al, 2004). In most cases, low-income households are producing for food supply more than in the other income groups (Flynn, 2002).

#### **2.7.1.2. Income generation**

UA can also help urban poor to increase their income. Accordingly, Essamuah and Tonah (2004) study in Tanzania indicated that UA is an important income-generating activity.

Bowyer-Bower et al (1996) argued, involvement in UA gives opportunity of income generation in two ways: directly/ indirectly.

Money that can be saved by growing vegetables or producing milk and eggs can be seen as the indirect impact of UA. Study result of Hanna Nassif in Dar es Salaam indicated that 10% of them saved their total monthly income. About 60% of the group of home gardeners in low-density area in Dar es Salaam saved an average of Tsh 19,000 per month (Mlozi, 1998). In Addis Ababa, the cooperative members are primarily growing vegetables for market, but the families also consume some of their product, saving 10-20% of their income that would otherwise be spent on food (Axumite, 1994).

Furthermore, the empirical evidence provided by Axumite (1994) indicted that the estimated average income of sample urban farmer households in Addis Ababa was above 50% that of the population of Addis Ababa. None of the urban farmers had an average monthly income below 125 ETB/month. In fact, 50% of the sample households had an estimated monthly income greater than that of 70% of the employed population in Addis Ababa. This income does not include the value of the vegetables consumed by the households themselves, or the investment allocation of the cooperative.

With regard to direct income impact from UA, Stevenson et al (1996) recorded that participants in UA in Arusha and Dodma in Tanzania earned Tsh 5,000 to 8,000 per month from selling of their crops.

### **2.7.1.3. Employment creation**

Labor for urban farming is derived from two sources: member of the household and hired labor. Most of the laborers in the member of the household are women and children, which is common in low-income households (Feoken et al. 2004).

Thus, by employing people who would otherwise be unemployed; UA can also help solve the problem of unemployment in urban areas. It is assumed to be an important coping mechanism in the informal economy (Gyamfi, 2002). In addition, it is estimated that the informal sector in Dar es Salaam provides 30% of the urban work force with employment. At the beginning of the 1990s, about 6% of workforce worked in UA (Madihi, 1991).

Furthermore, in many cities, the majority of urban dwellers depend indirectly on agriculture for their livelihoods, through employment in food transport, retailing, and processing which is the result of UA (Brook and Davila, 2000).

UA is the response of low-income urban households to food scarcity, as has been the case of the low-income full-time producer households in Addis Ababa (Axumite, 1994), the low-income part-time producers in Lusaka (Sanyal, 1985) and Nairobi (Freeman, 1991).

#### **2.7.1.4. Environment improvement**

UA has a significant contribution to solve environmental problems in urban areas. It can minimize the problem of waste disposal as it uses this as manure for agricultural production, thus contributing to improvement of the health of the people. Besides, it reduces urban pollution by recycling urban waste into production inputs. By using improved technology UA can use dirty water to grow crops after treatment. Thus, UA helps to protect the environment in a variety of ways (Diallo, 1993).

In addition, the following quotation summarizes the role of urban agriculture in solving environmental problems “Finding a safe and economical way to recycle some or all of the municipal and agro industrial waste holds the promise of ‘triple Win’ to clean up the urban environment, reduce the threat to health and increase agricultural production by replacing soil nutrients” (UNDP, 1996:10).

Besides, UA plays a role in greening the city as a result of urban forestry and gardening (Konijnendijk, 1999). It helps to capture CO<sub>2</sub> and dust, improving the micro-climate (McPherson, 1994). UA also reduces erosion and flood damage (Braatz, 1993, Chimbowu, 1993), decreases urban heating (Deelstra, 1999), breaks the wind and reduces noise (Carter, 1993). Rees (1997) asserts that UA maintains biodiversity

#### **2.7.2. Challenges and constraints of urban agriculture**

Challenges that urban agriculture encounters are different from country to country. However there are some similar challenges faced by to urban agriculture as discussed below.

##### **2.7.2.1. Policy related problems**

In general urban agriculture has not been given attention by both policy makers and the society. In many countries including Ethiopia there has not been any policy regarding UA, even though it has been included in urban development plans (Gilbert et al, 2000). As a result of this urban agriculture has been considered in many places illegal and many city planners consider it as a problem.

In addition, urban farmers do not get the support from the government which rural farmers enjoy. For example, there are no urban agricultural extension services which could improve the productivity and farming methods. Also there are no credit facilities for urban farming (De Lardemelle, 1996).

#### **2.7.2.2. Access to land and land size problem**

Insecurity of land tenure is a crucial problem in urban agriculture and this discourages urban farmers from investing in UA. This is mainly because urban farmers are afraid that they may be evicted from the land at any time (Drechsel et al, 2002). One of the causes of this problem may also be the negative attitude that policy makers have towards urban agriculture in many countries.

#### **2.7.2.3. Technical constraints**

There are also problems regarding technical services that are needed in urban agriculture. These include: waste recycling, inter-cropping, better animal health and husbandry management. These constraints adversely affect the productivity of urban agriculture (McGregor et al. 2002).

Until recently, there was very little research activities in the area and this partly made UA to be ignored by researchers. UA has long been considered as an unimportant economic activity as well as an illegal one. This has negatively affected the growth of urban agriculture (McGregor et al, 2002). If UA is to be encouraged and fully incorporated into urban planning strategies, then there is a pressing need for further research. As Nelson et al (1996: 17) points out, perhaps one of the main problems with much research has been that it, '...identifies the advantages of UA from a relatively restricted perspective.'

#### **2.7.2.4. Environmental and health problems**

Environmental and health problems are other challenges that are faced by UA. For instance, health risks might occur due to overuse of pesticides by inexperienced or illiterate workers may cause them to contamination by pathogens. There is also a possibility of transmission of diseases from animals and birds to humans (for instance

avian flu, sleeping sickness etc). Moreover, using untreated water for irrigation, and growing crops on contaminated lands can be another health risk (Mensah et al, 2002).

For example, a study conducted in Dar es Salaam, Arusha and Dodoma indicated that vegetable producers created tremendous health problems due to their intensive use of pesticides (Yachkaschi, 1997). Moreover, many producers use chemical in the ripped vegetables that they are consumed before the expiration of the chemicals which caused a serious health problem (Mlozi, 1998). Another health risk reported by Flynn (2002) in Mwanaza is that insecticides, fertilizers and animal wastes are washed into Lake Victoria during rainy season where it has caused several health problems.

## **2.8. Analytical framework**

In many ways UA provides a number of opportunities to those engaged in it. To start with, it can create employment opportunity, income generation activity, and food supply.

As to the employment opportunity UA creates opportunity of employment for both who are directly engaged in the farming activity and for those that are hired laborers, who leave on working this way to generate income.

In addition, the participant farmers in urban agriculture do benefit from the income that they generate from vegetable sales or dairy products. That means those who are engaged in the vegetable production or dairy farming activity can generate a considerable amount of income from the sale of their product which in turn helps the households to be self sufficient. They may also get involved in other income generating activities or expand their current business by using the income that they obtain from UA activity.

In most instances, the participants in UA activity have a better chance to consume more vegetable products and dairy products than their counter parts. That in turn helps them to consume a huge quantity as per their demand than the non-urban agriculture producers. They therefore can increase the nutrient intake of their household hence raising their access to a better food quality. At the same time they will have a chance to save the amount of money that would have been required to purchase what they consume, which

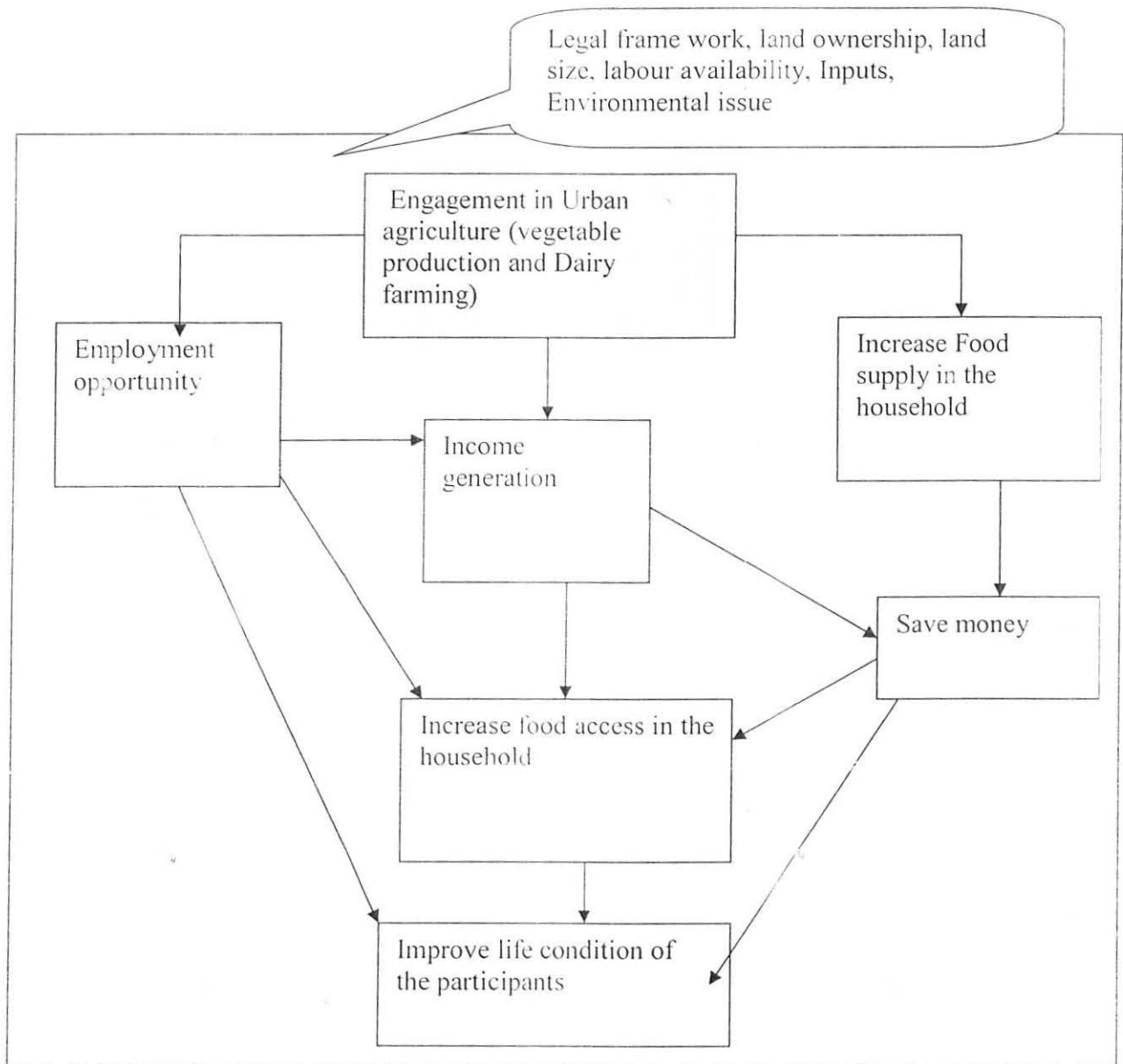
may encourage them to invest the money elsewhere or to use it for other consumable goods.

Nevertheless, urban agriculture is not free of obstacles, which can hamper the benefits that can be obtained from it. For instance, lack of a clear legal framework under which the UA activities work, which in turn affects the participant's livelihood negatively. Other factors that constrain UA are lack of sufficient cultivable land and land ownership problem.

Lack of proper market situation together with poor prices that are attached to vegetable production hamper UA. Lastly, the poor health problem that is associated to dairy farming and sometimes vegetable production may cause additional cost to the participants. The other main constraint that the UA participants faced is lack of inputs such as feed for their dairy cattle, veterinary medicine, fertilizer and extension service. Furthermore, lack of policy on UA land ownership right and size of land limits them from efficiently using their capacity to produce.

Figure.1 shows conceptually linked benefits of urban agriculture with the people's livelihood and the challenges that urban agriculture from realizing its full potential to the benefits of participants in UA.

Figure 1. Benefits and challenges of UA and their linkages



Source: Own formulation, 2008

## **Chapter Three: Description of the study area and Methodology**

This chapter provides information pertinent to the study area. The major physical, agro-ecological zones, and land use pattern, which are relevant to the objective of the study, are described as per their logical order. In addition, core socio-economic background characteristics of Addis Ababa city administration and urban agriculture situation in Addis Ababa city are described. In the next sub-section the method used in order to carry the study was clearly depicted.

### **3.1. Description of the study area**

#### **3.1.1. Physical features**

Under this sub-section, the geographic location of Addis Ababa, agro-ecological zones of the city administration and the land use pattern of the city administration is depicted.

##### **3.1.1.1. Geographical location and topography**

Addis Ababa city lies in the central plateau of Ethiopia between 8<sup>0</sup> 55' and 9<sup>0</sup> 05' north latitude and 38<sup>0</sup> 05' and 39<sup>0</sup> 05' east longitude. The territory of the city is found with in an altitudinal rage of about 2200-2500 m a.s.l. Located at the foot of Entoto-with 3000 m a.s.l at its highest peak. It is characterized with rolling hills and flat in the southern part. Deep gorges, river valley and rolling plains are found along the river basins, which starts in the NW and NE directions to the city and drain into Awash River. These rivers include Kebena, Ginfile, Akaki, Buhe, Kechere and Bubula (IPS, 2007).

Nefas Silk Lafto Sub City (NSLSC). one of the ten sub cities in Addis Ababa, was established in the south western part of Addis Ababa following the city's *Kebeles* and sub-cities establishment proclamation No 1/1995. Despite variation in height, its average altitude is about 2300 m a.s.l. NSLSC shares common boundary with different sub-cities and Oromia regional state. Accordingly, Akaki-kaliti border in east, Bole in NE, Kirkos and Lideta in NW, Oromia region in south and South West. The territory of NSLSC by and large tends to flat land (IPS, 2007).



Map of Nifasilk lafto Sub-city which shows green areas indicated by dark  
Source: Nifasilk lafto sub-city

### 3.1.1.2. Agro-ecological zones

Addis Ababa experiences the tepid to cool humid plateau agro-ecological zone. NSLSC tends to the cool humid one. The average monthly day time temperature is 21-24<sup>o</sup>c while 7-14<sup>o</sup>c is the average for the night in NSLSC. The annual average temperature varies between 12.5<sup>o</sup>c and 18<sup>o</sup>c (IPS, 2007).

The rainfall pattern of Addis Ababa is the bi-modal type: the main rainy season (*meher*) from mid June to end of September and the small rainy season (*belg*) from March to the middle of May. The precipitation varies between 1300 mm and 1500 mm with potential evapo-transpiration of 900 mm to 2000 mm per annum. The growing period for most crops is between 241 and 300 days (IPS, 2007).

Chromic Luvisols, Halphic Taorems Pellilie vertisols, cambisols and Rogosol are some soils of Addis Ababa. Black, red and redish brown are the way some soils of the city are classified. In NSLSC the above named soil types are observed in different proportion.

Black soil takes the lion's share in this sub city and its depth extends to 2 meters in some area (IPS, 2007).

### 3.1.1.3. Land use pattern

The 1995 master plan of development of Addis Ababa shows that the total area of the sub- city is estimated to be about 51,900 ha of which 4,426 ha (about 8.7%) goes to NSLSC. Different land use pattern is observed in the city: mixed use built up area and forest area account for 16,274 ha (31.35%) and 12,176 ha (23.46%) respectively; Agricultural land is estimated to be 7,175 ha (13.82%). The same source indicates that 6,874 ha (13.24%) is allocated for housing expansion, 1,739 ha (3.4%) is already used for industry and service development while 2,377 ha (4.61%) is proposed for future industrial and social service development (See Table 1).

**Table 1.** Present land use pattern in Addis Ababa city

Description	Area (ha)	%
Centers	1276	2.46
Forest	12176	23.46
Agriculture	7175	13.82
Existing Industry	1244	2.40
Proposed Industry	1777	3.42
Mixed use built up	16274	31.36
Proposed social service	600	1.16
Existing social service	495	0.95
Transport	989	1.91
Housing expansion	6874	13.24
Road Network	1975	3.81
Reserved	1045	2.01
Total	51900	100

Source: Addis Ababa city Master plan Department office, 2006

### **3.1.2. Demographic and socio-economic features**

#### **3.1.2.1. Demographic features**

The population of Addis Ababa city's population is estimated to be about 4 million people out of which about 400,000 people were living in NSLSC in 2005. The annual population growth rate reaches 5% (CSA, 2004). The same source indicates population aged 10 and above accounts for 81 percent and economically active population constitutes 53% of the total population. Immigrants accounts for 57.8% of the total annual population growth (CSA, 2004). The high rate of population growth, which is the incompatible with economic growth, is the major challenge in meeting the demand for economic and social services in the city.

#### **3.1.2.2. Socio-economic aspects**

Massive poverty, food insecurity, high unemployment rate and inadequate and poor quality social and economic infrastructures are some common problems of third world cities. Addis Ababa city included. Nowadays, feeding the urban population is a big deal that captures attention of planners, policy makers and individuals as well as institutions working in the area. Thus, it is crucial to look at the socio-economic indicators of people in Addis Ababa.

#### **3.1.2.3. Income**

According to CSA (2004) more than 50% of Addis Ababa city's population is living below the poverty line (1USD day). Information from the same source reveals that 72.2% of the total city's household earns less than 299 birr/ month while 15.7% and 5.9% earns between 300 and 599 birr/ month and 600 and 899 birr/ month respectively. Only 6.2% households earn more than 900 birr/ month. Thus, the majority of the city's households earn inadequate income to support their livelihoods. Table 2 shows the household income distribution in Addis Ababa.

Table 2. Households income distribution in Addis Ababa

Income class (birr month)	% of population	Cumulative percentage
<50	16.0	16.0
50-90	21.7	37.7
100-199	22.3	60.0
200-299	12.2	72.2
300-399	8.1	80.3
400-499	4.5	84.9
500-599	3.1	87.9
600-699	2.5	90.4
700-799	1.7	92.1
800-899	1.7	93.8
900-1250	3.1	96.9
> 1250	3.1	100
Total	100	

Source: CSA (2004)

Unfortunately, such data is not available for individual sub cities, but NSLSC shares a relatively similar situation to that of the whole city. Information obtained from the Sub-city. Trade and Industry unit confirms that the majority of the population in NSLSC is living below the poverty line.

#### 3.1.2.4. Employment

Employment is another important issue that indicates the development level of a given nation. High unemployment rate is manifestation of low level of development. According to the Ministry of Labor and Social Affairs cited in CSA (2004), the unemployment rate in the city of Addis Ababa is about 42 percent. NLSC is also not insulated from this high rate of unemployment.

According to CSA (2004) report, service sector absorbs about 72.7% of the labor force in the city followed by Industry (24%). The agricultural sector share is less than 3.5 percent.

Indeed, the same information cited share of the three sectors in the GDP of the city. Accordingly, the industrial sector takes the lead by contributing 46% while service and agricultural sectors make up the rest 45% and 9% respectively (See Table 3). However, in terms of employment type 41% and 37% are governmental and non-governmental employees respectively, while 32% is self-employed Labor (CAS, 2004).

Table 3. GDP and Employment share of major sectors in Addis Ababa (2004)

Sector	GDP (%)	Employment (%)
Industry	46	24
Service	45	72.7
Agriculture	9	3.3
Total	100	100

Source: CSA (2004)

### 3.1.3. Urban agriculture situation in Addis Ababa city administration

Urban Agriculture in Addis Ababa constitutes cereal production, vegetable production, livestock and apiculture. The following sector focuses on vegetable production and dairy farming.

#### 3.1.3.1. Vegetable production

Vegetable production is exercised along Kebena, Bulbula, Shankla, and Akaki rivers in Addis Ababa city. There are co-operatives as well as individuals who are engaging in the activity. These vegetable growers and marketing service cooperatives with total members of 957 grow vegetable on 400 ha of land (IPS, 2007).

According to the information obtained from Addis Ababa city urban Agriculture Department, in 2007 about 119, 560 quintals of vegetable of different type were produced. The practices follow traditional irrigation method using ditches and channels (IPS, 2007).

Cabbages, carrot, beetroot, cauli flower, tomato, onion, and pumpkin are some vegetables commonly grown in Addis Ababa city. Pepper, Lettuce, Swiss Clad, celery, Garlic and Parsley are also found among the vegetables in the city (IPS, 2007).

### 3.1.3.2. Dairy farming

Dairy farming is one of the urban and peri-urban agricultural activities exercised in and around Addis Ababa City. In peri-urban areas there are above 36,000 cattle. In the city there are about 31,000 exotic milk cows. According to the city's urban Agriculture Department there are 5,167 raising cows in Addis Ababa. This accounts for 18% of the country's total breeding centers. But, currently some centers are closed up as the land is prioritized for other sectors (IPS, 2007).

In 2007 about 64,415 tone of milk was directly supplied to Addis Ababa from milk cows in and around the city as well as from milk factories. In the year indicated about 71% of the total supply came from milk cows and processed milk supplied by factories in Addis Ababa constituted 19% of the total (IPS, 2007).

Table 4. Dairy farms by holdings in Addis Ababa

Milk Cows	Frequency	Percent	Milk production_share (%)
1-5	4,825	93.4	66
6-10	200	3.9	12
>10	142	2.7	22
Total	5000	100	100

Source: IPS, 2007

Table 3.4 indicates that there are about 5000 households which are practicing dairy farming. Majority (93.4%) of the households own less than five milk cows each but contribute the lion share (66%) of annual milk supply in Addis Ababa. Only 2.7% of dairy producer households own more than 10 milk cows and contribute 22% of annual milk production.

Crop residues and hay are the main cattle feed in Addis Ababa. In addition, there are also industrial by products, improved forages and others. Percentage contribution of each feed source is not recorded in the city's Urban Agriculture Department.

## **3.2. Research methodology**

The following section deals with the methodological procedures that have been followed in the course of the study. The sampling technique, data gathering instruments and methods of data analysis are described as follows.

### **3.2.1. The study population and sampling design**

A multi-stage purposive sampling design and random sampling techniques were employed for the selection of the study site and the respondents respectively. In the first stage the study site Nifasilk Lafto Sub-city was purposively selected because of its accessibility to the researcher and that many UA activities are undertaken in this sub-city.

In the second stage, from Nifasilk Lafto sub-city Mekenisa Gofa-Saris Vegetable Producers and Marketing Service cooperative (MGS-VPMSC), and Tenachin Milk Producers and Marketing Service Cooperative (TMPMSC) were selected purposively, giving due attention to the number of UA practitioners involved and accessibility to the road.

In the third stage, from the selected cooperatives, individual respondents stratified by gender, were randomly selected applying the method developed by Carvalho (1984, as cited in Zelalem, 2005:8) as shown in Table 5 below. In order to disseminate the survey questionnaire representative samples were drawn from each stratum using lottery method. Based on the data obtained from the respective cooperative office there were nearly 250 participants in MGS-VPMSC. Of these 20% were females and 80% were male household heads. Accordingly, 14 female vegetable producer from 50 female heads and 56 male headed households from 200 male households were taken.

Tenachin Milk Producers and Marketing Service Cooperative (TMPMSC) comprising 53 dairy farmers, of whom 56.6% were female and the remaining male members. Simple random sampling technique was employed to sample the individual respondents. Accordingly, 57% of the total population (which means 30 individuals) was sampled. Following this, proportionate simple random sampling was used to select the individual

respondents, which means 17(56.6%) female household heads and 13 (44.4%) male household heads. Lottery method was then used as an instrument to select the individual respondents.

Table 5. Sample size determination from Homogenous population

Population size	Sample Size		
	Low	Medium	High
51-90	5	13	20
91 – 150	8	20	32
151- 280	13	32	50
281 – 500	20	50	80
501 – 1200	32	80	125
1201 – 3200	50	125	200
3201– 10000	80	200	315
10001-35000	125	315	500
35001- 150000	200	500	800

Source: Zelalem (2005)

### 3.2.2. Data collection instruments

#### 3.2.2.1. Primary data

**Household survey:** To obtain information at the household level, a structured questionnaire was used. Prior to conducting the survey, pre-test of the survey schedule was undertaken and accordingly it was improved. Then the survey was conducted on the selected respondents in the study site.

**Focused group discussion & key informant interview:** To elicit the required information, checklists were used. These instruments were used to collect complementary information on the contributions and challenges of urban vegetable producers and dairy farmers. To identify participants for focus group discussion, case studies and key information giving, I met the cooperative secretary, heads of the cooperatives for both the vegetable producers and the dairy farmers who knew in detail successes, failures and challenges of farmers since the establishment of the cooperatives.

**Focus Group Discussion (FGD) One:** A group comprising 14 members were purposively sampled and due attention was given to heterogeneity and specific experience on vegetable production. Accordingly, 3 male household heads who have more than 43 years of experience in vegetable production, 3 female household heads with a minimum of 26 years experience in vegetable production, and 3 from each young male and female household heads. cooperative head of vegetable producer and his vice were member of the first FGD.

**Focus Group Discussion (FGD) Two:** The FGD participants from the dairy farmers were consisted of 9 individuals. These were-4 elders who have been working in the dairy farm for at least 12 years (two male and two female households), the cooperative head and his vice and 3 Development workers.

**Key Informants Interview () One:** Five individuals were purposively sampled, giving attention to heterogeneity and specific experience on vegetable production in and around urban areas. Accordingly, 2 individuals from Addis Ababa urban agriculture office, 2 from sub-city vegetable production inspection office and an accountant who has been working for 15 years in cooperatives and at the same time who was a producer interviewed.

**Key Informants Interview () Two:** For dairy farm producers 3 key informants were selected based on their experience in dairy farm activities. Accordingly, two individuals from the dairy cooperative and one individual from Addis Ababa urban agriculture office were interviewed.

**In-depth Case study:** In order to substantiate the information obtained from household survey, key informants and focus group discussion detailed case studies were made with different households. Eight individual cases were treated by purposively sampling individuals in light of the objectives that this study inspired to address.

**Direct observation:** Direct observation was used to supplement the data obtained from other data gathering instruments. In this respect, the ultimate goal of the direct observation was to see what was done by whom and at what time or circumstance and then to describe, analyses and interpret the observations.

### **3.2.2.2. Secondary data**

To further supplement the data different documents including reports other documents obtained from NSLSC were consulted.

### **3.3.3. Method of data analysis**

In order to meet the specific and general objectives of the study, multiple methods ranging from quantitative to qualitative methods were employed to understand and examine the contributions and challenges of the participants in urban agriculture.

The method of triangulation (cross checking) was used to analyses the qualitative data obtained from FGD, KI and case studies. In doing so, the internal validity of the study was critically studied. Descriptive statistics (such as percentage, mean, and standard deviation) were used for comparison purposes. Bivariate analyses such as independent t-test and Pearson  $\chi^2$ -square test were used to show the mean difference of continuous variables and the association of categorical and dependent variables respectively.

In addition, the results obtained from the quantitative study were cross checked with the result obtained from the qualitative study. The SPSS 15.0 software package was used to organize, code, arrange and analyze the data.

## **Chapter Four: Results and Discussion**

This chapter describes the major findings and discussions on the household background characteristics of vegetable producers and dairy farmers. Reasons for household engagement in vegetable and dairy production, contributions of vegetable and dairy production, and the challenges of efficient production of vegetable and dairy are depicted.

### **4.1. Background of the study cooperatives**

In this section background information that is relevant to understand MGS-VPMSC and TMPMSC is presented.

#### **MGS-VPMSC**

Mekenisa Gofa-Saris Vegetable Producers and Marketing Service Co-operative (MGS-VPMSC) was established in 1974 during the Derge régime. When the cooperative was established, it had 150 hectares although current land holding of the cooperative diminishing due to different compelling reasons. Each members of the cooperative share 50 hectares (33.3%) equally out of the total land of 150 hectares. And the remaining 100 hectares shared for groups which consists seven up to eight individuals. This group farm together and split the profit among individual members in the group. However, some portion of the profit ranging from 1000-2000 Birr/year will put in the cooperative account. So that the cooperative could provide inputs (seeds, fertilizer, hoes, and some times pesticides) with reasonable price, pay electric bill and salary to the cooperative office workers and the remaining will be kept in saving account for cooperative. Thus the members of the cooperatives make a living on both on 2000 sq.m backyard and group cultivated lands.

As the participants in FGD and KII witnessed, vegetable production had been practiced by most of the founding members in their own vicinity before the actual foundation of the MGS-VPMSC and some of them had been working as a tenant for the land owners. However, at the time when the cooperative was established the founding members were

relatively few in number. Later the regime forced individual workers to join the newly established cooperatives to form a collective production system.

In addition, all the sampled household heads and the information obtained from the FGD and KII asserted the same fact that all members produced more than one type of horticultural crop such as lettuce, tomato, carrot, cabbage, beet root, colic flower, *fosolia*, onion, beetroot and so on.

### **TMPMSC producers**

Tenachin Milk Producers and Marketing Service Cooperatives (TMPMSC) was established in 2006 through the initiative of the Nifas Silk Lafto Sub-city agriculture unit with the very aim of curbing problems related to cattle feed, land shortage and marketing. There are fifty three members in TMPMSC out of which 56.5% are females.

TMPMSC engages only in the production of milk and the income obtained from this is used to purchase feed and to facilitate market situations. Individual members own different numbers of milk cows. Accordingly, about 60% of the total members own less than five milk cows. The maximum number of milk cows owned by an individual reaches up to fifty. However, members who have more than 10 cows constitute only 12%. Depending on the situation of the dairy cows, members contribute 10 to 20 liters per day. The collected milk by the co-operative is then sold to milk processing enterprises like 'Mama' and 'Shola'. On the other hand, an individual member can take his milk to a market in any way he/she prefers after contributing his/her share to the co-operative.

## **4.2. Socio-economic and demographic characteristics of the sample households**

In this section socio-economic and demographic characteristic that is related to family size, labour availability, and education status of both vegetable producers and dairy farmers are presented.

### **4.2.1. MGS-VPM socio-economic and demographic characteristics**

The finding of the study revealed that the average family size in the female headed households was 6.2 individuals while the male headed households were a bit larger than

the female headed households (7.6 individuals). The presence of high family size may be attributing to the need to have more children as an asset for securing an old age support. Yet, in both household heads the average family size is higher than the national average (5 individuals). As well, there was a significant mean difference in family size between female and male household heads at 1% significant level (see Table 6 below).

**Table 6.** Family size as per gender of the household head

Family size	Male household Head (n=56)	Female household head (n=14)
Mean	7.53	6.21
SD	1.26	1.05
t-value	3.606	
P-value	0.001	

Source: Own survey 2008

Based on the education status all the members of MGS-VPMS as well as the sample respondents were found to be literate.

According to the information obtained from, it was indicated that not less than 99% of the cooperative members and 100% of the survey participants are ethnically Gurage. This is because during the formation of the collective farms in the former regime, the member had tended to bring their own relatives. Some attribute this to the long standing tradition of the Gurage society to help each other.

According to Table 7 the average labour availability in Adult-equivalent person (AEP) appeared to be 2.2 and 1.9 in male and female households respectively. This indicated that there is a significant difference in the labour availability between the male and female household heads at 1% significant level. This disparity in the labour availability between the male and female households might have resulted from the relatively small family size in female household than male households.

**Table 7.** Labour availability as per the gender of the household heads

Labor availability in Adult equivalent person(AEP)	Male household heads (n=56)	Female household heads (n=14)
Mean	2.2	1.9
SD	1.04	1.21
t-value	3.037	
P-value	0.004	

Source: Own survey 2008

#### **4.2.2. TMPMSC socio-economic and demographic characteristics**

The study found out that the average family size in the sampled household was 6.3 individuals which is above the national average. However, the educational status of the sampled households indicated that all of them were literate.

The average labour availability in the sampled household in AEP was 1.6 for female and 1.86 for male households. Apart from the available labour force in the households, the farmers tended to hire additional labour from out side the households. Accordingly, 83% of the samples households have divulged that they hired labour out side their family (see the table 8 below). This to support their farm activity as it demand more labour other than the household labour.

**Table 8.** Hired labour in dairy farmer households

Do you hire labour?	Frequency	Percent
Yes	25	83
No	5	17
Total	30	100

Source: Own survey 2008

### **4.3. Participation of members in production activities**

#### **4.3.1. Gender and engagement in vegetable production**

Currently, the members of MGS-VPM cooperative reaches up to 250 individuals. Out of these 20% are female while the remaining are male household heads.

According to the sample households, 40% of them reported that vegetable production is the responsibility of females while 60 % of them have revealed that such an activity is the responsibility of males (see Table 9). This result is not in line with many experiences in the African culture. In contrary to this finding, Axumite (1994) indicated in her study that females took the lions share in vegetable production.

Such a different scenario in the present study in vegetable production among males and females might be attributed to the awareness developed that women and men should share tasks of the household. However, the study conducted in Dar es Salaam by Foeken et al (2004) revealed that the wife of the male household head spent more time on crop cultivation than her husband.

It was understood from the FGD and KII, in most instances activities such as harvesting, weeding and planting were performed by females. To elicit the above fact, the result obtained from individual responses indicated that 34.3% of females perform the harvesting and 45.7% of them perform all harvesting, weeding and planting together (see Table 9).

Table 9. Responsibility and females' particular engagement in vegetable production

Whose responsibility is UA?		Frequency	Percent
Sex	Females	28	40.0
	males	42	60.0
	Total	70	100.0
<b>In what particular agricultural activities are females engaged in?</b>			
		Frequency	Percent
Types of work	Harvesting	24	34.3
	Weeding	7	10.0
	Planting	7	10.0
	All	32	45.7
	Total	70	100.0

Source: Own survey 2008

However, difficult task such as digging was found to have significant and strong relationship with the household head sex type at 1% level. As can be seen in Table 10, in the male headed households, only 5.4% of females were given the responsibility of performing difficult task like digging. Thus, the majority of females were not given the

responsibility to perform difficult tasks in the male headed household. However, in the female headed households 35.7% of females appeared to perform digging while majority, 64.3% of them were not. Thus, the relatively higher number of female household head participation in difficult tasks might be attributed to the financial constraint to hire extra labour. At the same time, the absence of male household heads has led females to do the farm activity on their own.

**Table 10.** Participation in digging activity by sex

		Do females participate in digging activity?		Total
		YES	NO	
Sex	Male Household head	3(5.4)	53(94.6)	56(80)
	Female Household head	5(35.7)	9(64.3)	14(20)
Total		8(11.4)	62(88.6)	70(100)
Pearson Chi-Square 10.197 P-value 0.001				

Source: Own survey 2008

The result obtained from the individual cases consolidates the above fact that women participation in difficult task like digging depend on the sex of household head.

**BOX-1. Case study- Beletu G**

Mrs. Beletu, about 46 years old has been practicing vegetable production and marketing for the last twenty years in Nifas Silke Lafto sub-city. Beletu has nine family members and she completed Grade 12.

Cabbage, lettuce, beetroot, carrot and onion are vegetable types produced by Beletu on her plot. As Beletu explains,

*“My husband with other hired labourers carry out land preparation, sow seeds and dig the water way and my role is weeding, watering and preparing food. I am not facing to much burden like the other female household heads face. This is because my husband does his part in digging the land and performing other difficult tasks in collaboration with the hired labourers.”*

depicted in Table 11, 57.1% of the sample households indicated that they have engaged

in farming activity for their ultimate goal of generating income and for personal consumption of the products. Whereas, 4.3% of them were purely engaged in farm activity for consumption, 38.6% of them indicated that their engagement in vegetable production was solely for generating income. Thus, what they consume seems to have an impact on their ability to save a part of their income that could possibly be spent for the purchase of vegetables.

**Table 11.** Reason for vegetable production

Reason for engagement	Frequency	Percent
For own consumption	3	4.3
For sale	27	38.6
For sale and own consumption	40	57.1
Total	70	100.0

Source: Own survey (2008)

Axumite's (1994) findings showed that consumption of vegetables by UA households was 10% higher than the urban average, enabling them to save 10-20% of their income. Unlike to this particular case study of MGS-VPMSC, more than 18% of the total household vegetable production in East Jakarta was for consumption (Sayanal, 1985). However, percentages are much higher in other surveys conducted in African cities, as urban farmers produce largely for household consumption: for example 77% of vegetable producing household in urban Kenya is produced for consumption (Smith, 2002). In particular in Nairobi, over 50% of the households used the entire product to feed their families or dependents (Loods, 1998).

### **Box-2. Case study-Mulonesh B**

Mrs. Mulonesh whose age is 58 engaged in vegetable production since 1972 G.C. She has 7 family members and the vegetable production they engaged in is their sole means to generate income. Mulonesh has indicated the benefit that her family is obtaining from the vegetable production as follows:

*“My family produces the vegetables for two purposes, to generate income and for our own consumption. We are getting more products than what we need for home consumption as a result s we are able to take the rest to the market. It enables my family to reap an income in the range of Birr 1200 to 1800 depending on the seasons.”*

#### **4.3.2. Gender and engagement in dairy farming**

Currently, members of the dairy farm cooperative reach to 53 individuals. Of these, 56.7% of them were found to be females and the remaining were males. However, for the purpose of this study, 17 females and 13 males were sampled.

To the question of why urban dwellers raise livestock, household consumption and income generation appeared to be the two most frequently mentioned answers.

From the sampled households, 33.3% of them depicted that the ultimate objective of their engagement in dairy farm was to generate income. From the FGD it could be stipulated that these dairy farmers bring their products to the market to sell in order to cover their living costs. For this reason they do not consume their product within their households. Fifty percent of the sample households expressed that their main objective of engagement in dairy farming was for both income generation and household consumption. With in these households, the income generated from the selling of their dairy products is used for the purchase of other food items, clothes, and paying tuition/ school fees (see Table 12).

**Table 12.** Reason for engagement in Dairy farming

	Frequency	Percent
For income generation	10	33.3
Both for income and household consumption	15	50.0
For employment generation	5	17.7
Total	30	100.0

Source: Own survey 2008

Besides its benefits for household consumption and income generation, urban livestock production is providing employment opportunities for the owners of the livestock, for hired labourers and for people in other economic sectors linked to the farming sector. Another advantage is the provision of the manure for vegetable producers.

The FGD conducted on the issue of dairy farming asserted the above fact that the households are able to benefit in many ways from their dairy farm. In addition, there are individual members who provide milk in special occasions (holidays) to HIV/AIDS victims, children with low socio-economic families (destitute), to relatives and neighbors. They said that it has helped them to have strong social ties with their neighbors and relatives, which sometimes gives them chances to get grazing land and residue of local beverage (like *atellaa*).

The following case-study demonstrates some of the benefits that could be gained from dairy farming.

**Box-3. Case study- Gebayinesh A**

Mrs. Gebayinesh, about 58, has been practicing dairy farming since 1990 G.C. She was employee in a Coffee market enterprise with a monthly salary of 250.00 birr per month, and parallel to that she started raising cattle on her own after work time. As she explains in her own words:

*“Being a government employee with 250.00 birr monthly salary, I used to earn 500.00 birr per month from the sale of milk. Later, I changed my position in the organization to guard, which gave me the chance to have 10 days off in a month.*

*This was an opportunity for me to spend more time on dairy farming. Then after, hiring herders on a plot of land beyond Biher Tsige recreation center, I began dairy farming with relatively better commitment.*

*...Con't*

In 2003 the 'Coffee market enterprise' was closed down and Gebayinesh also retired. Her husband as well retired from the same organization. This led them to spend their full time on dairy farming.

At the time this case study conducted, Gebayinesh's family had four cows, six milk cows and other four pregnant cows and six calves- a total of twenty cattle.

Currently, Gebayinesh's family size is nine of which four of them are employed in their own farming with a monthly salary of 800.00 birr per month.

Milk and dung are the major products for market as well as for household consumption. Gebayinesh noted that the income earned from dung is some times better than that of the milk. Totally, Gebayinesh reaps 8000.00 birr per month from milk sale alone, which is then used for workers salary, fodder and household expenses including food for workers and family, and for facilities like working clothes, shoes, tools etc.

Gebayinesh further revealed that her family exempted from buying butter for about 16 years. Moreover, she explained that she was able to rebuild her family's house and make well furnished.

#### **4.4. Contributions of UA to member households**

The following section deals with the benefits that could be gained from vegetable production and dairy farmer. These include such advantage as creating employment opportunity, attaining food security and generating income.

##### **4.4.1. Employment creation**

###### **(I). Vegetable production**

Engagement in urban agriculture provides direct employment opportunity both for the members of farming households and hired labourers. Table.13 below depicted that 57.1% of male household heads were engaged in vegetable production to improve the income level while 100% of the female household heads indicated the same reason. In addition,

42.9% of the remaining male household heads portrayed that their reason of engagement in vegetable production was due to unemployment in any other sectors. This implies that when there is low income at the household level the tendency for the households' to engage in vegetable production is higher in female household heads than in male household heads. As male households are encouraged by the culture to be employed whereas in female as their skill and knowledge is relatively negligible getting a formal employment is very low.

**Table 13.** Reasons for engagement in vegetable production by gender of household heads

		what make to engage in UA	
		Low income level	Unemployment
Sex	male	32(57.1)	24(42.9)
	female	14(100)	0
Total		46(65.7)	24(34.3)
Person Chi-square 9.130 P-value 0.003			

Source Own study(2008)

Despite their reason that they have engaged in the farm activity due to low income only a very slim part (14.3%) of them indicated that they would stop their farm activity when there is a better income situation. However, the remaining 85.7% of households indicated they have the interest to pursue vegetable production activities even if their apart from the household income improvement.

As their reason for not stopping vegetable production even if their economic situation improves. 51.7% of them have revealed that for them vegetable production is living necessity and a basic means to survive, whereas 48.3% of them, have a doubt that they may not get job opportunity if they stop vegetable production (see Table 14 below).

Thus, regardless of a possible change in income situation, urban vegetable producers believe that vegetable production has created access for employment opportunities for them. The study conducted by Madihi (1991) in Tanzania Dar es Salaam revealed the same fact that vegetable production provided 30% of the urban work force and hence is an income generating activity. In addition, the study conducted by Axumite (1994) in

Addis Ababa indicated the same reality that low-income urban poor households were getting full-time employment through their engagement in vegetable production, while the low-income part-time producers in Lusaka (Sanyal, 1985) and Nairobi (Freeman, 1991) indicated they have got part-time employment.

**Table 14.** Reason for continuing in UA activity where there is no economic stress

	Frequency	Percent
It is necessity	31	51.7
Unemployment fear	29	48.3
Total	60	100.0

Source: Own survey 2008

## (II). Dairy farm

Dairy farming provides opportunities for employment both for hired labourer and farmers. Though only 17.7% of the dairy farmers indicated that they were engaged to have employment as indicated in Table 12, of these 65% of them unveil that they were engaged in farming on a full-time bases.

However, 90% of them indicated that they used hired labourers. Depending on the number of cow that the household owns the number of hired labourers varies. Accordingly, 56% of the sample households have revealed that they have one hired labourer, 15% of them also indicated that they have exactly two hired labourer. In addition, 14% of them disclosed that they have at least three labourers (see Table 15 below). This indicated that dairy farmer create employment opportunity for hired labourers for cleaning barn, milking and preparing fodder for animals.

**Table 15.** Number of hired labourers in the study sample households

	Frequency	Percent
One hired labour	17	56
Two hired labourers	6	15
More than three hired labourers	4	14
None	3	10

Source own study 2008

#### 4.4.2. Contribution to food security

##### (I). Vegetable producers

Vegetable producing farmers have indicated that 78.6% of them improved their food security status due to their engagement in vegetable production, while the remaining 21.4% of them indicated that there is no change in their food security status that they have realized upon their engagement in vegetable production (Table 16). This fact has been attested by Sawio(1993) in his study that half of the survey respondents indicated that urban farming provided them 20 to 30% of their food supply

On gender basis 50% of female and 68.6% of male household heads have indicated the betterment of their food security status upon their engagement in vegetable production activity. The Pearson chi-square correlation indicated that there is a strong and significant association at 1% level between food security status and sex of the household head. This may be due to the fact that the male household heads are engaged in additional source of income generating activity or since male household heads have got relative high labour availability which may help them to produce substantial amount of vegetable products as compared to their counterparts.

Similarly, the in depth interview conducted with FGD portrayed the fact that their engagement in vegetable production has improved their food security status. One of the 65 year old household head participants in FGD said the following:

*“We are benefiting from vegetable production in many ways. We can sell our vegetable to generate income, we consume part of it to the extent what our family needs, and we can save income which we could have been used to purchase vegetable. Above all, it has improved our life condition much better than before our engagement. And we are able to purchase food with the income that we generate to from vegetable product”*

This saying firmly attested the fact that vegetable production has also helped them to save money that would possibly be used for the purchase of other consumable goods. This result is in harmony with the study conducted by Bowyer\_Bower et al (1996), Mlozi(1998) and Axumite (1994) in Hanna Nassif Dar Se Salaam, Dar Se Salaam, and Addis Ababa respectively. Their engagement in vegetable production has helped the

farmers to save 10% to 60% in Dar se Salaam and families in Addis Ababa who are engaged in vegetable production consume some of their produce, saving 10-20% of their income that would otherwise be spent on purchasing of vegetables.

**Table 16.** Food security by the gender of the household heads

	Improvement in food security status		
	YES	NO	
Household heads(n=70)	Male	48(68.6)	8( 11.4)
	Female	7 (10)	7(10)
	Total	55(78.6)	15(21.4)
Pearson chi- square value 8.485			
P-value 0.004			

Source: Own survey 2008

## (II). Dairy farming

Most of the sampled dairy farmers have disclosed that their food security status have showed a dramatic improvement upon their engagement in their dairy farm. Accordingly, 87% of them have attested to this fact.

However, variation has been observed on the level of food security based on the number of cows they own. Accordingly, 20% of the household who have one cow disclosed that their food security status still does not show improvement. Eighty percent of the households indicated that their food security has been improved substantially. A household, one individual was found among households who have two cows as being food insecure, while no farmer was found among household having three or more cows as being food insecure. This reveals show that the number of cow owned by a household has a direct effect on the food security of that household (see Table 17).

**Table 17.** Food security by number of dairy cows in the households

Number of cows		Food security status	
		Secure	insecure
One	20(68)	16(80)	4(20)
Two	7(22)	6(83)	1(17)
Greater or equal to three	3(10)	3(100)	---
Total	30(100)	25(87)	5(13)
Pearson chi-square value 6.435		P-value 0.067	

Source: Own study (2008)

The information obtained from the FGD further consolidates the above fact that most of the dairy farmers are food secured through the engagement in dairy farming. As one participant in FGD has revealed:

*“My family was leading a destitute life before my engagement in dairy farm production. However, upon my family engagement in dairy farm we are able to improve our food security status.”*

#### **4.4.3. Contribution to income generation opportunity**

##### **(I). Vegetable producers**

All the sample households portray that their income has increased or has shown improvement as a result of their engagement in vegetable production. This has resulted from the income that they generated from the sale of the vegetables they produce. On the gender base, female household heads generate on average Birr 1267.85 per month between November to June while male household heads generate on average Birr 1407.50 between the same months. This difference could be an indication of the male households' ability to produce more vegetables than that of the females'. As male headed households command more labour in the plot.

However, as the FGD and KII indicated in the four months (July, August, September and October) they do not have any means to reap income from their farm. For the rainy season is not conducive for vegetable production due to intensive flooding and torrential rain.

In Table 18 below the independent t-test indicated that there is a significant mean difference in the income that the female and male household heads generate at 1% level. This disparity could be the result of a difference in the skill each household possesses in the farming activity or due to the sufficient labour that exists in male household as compared to female household heads.

**Table 18.** Income obtained from vegetable production by gender of household heads

Income (Birr/month)	Male(n=56)	Female (n=14)
Mean	1407.50	1267.85
SD	259.40	129.50
t-value	2.851	
p-value	0.007	

Source: Own survey 2008

The case study revealed that vegetable production helped them to sustain life as well as to purchase basic consumable foods and to cover other expenses with the income they generate.

#### **BOX-4. Case Study- Emebet A**

Mrs. Emebet is about 46 and has been practicing vegetable production and marketing for the last fourteen years in Nifas Silke Lafto sub-city. Emebet has nine family members and she completed Grade 12.

*I own 2000 sq.m backyard gardening and I am a member of MGS-VPMS. Previously, my family was one of the tenants but later with the coming up of Derge regime we owned a farm land of our own. I inherited this plot from my family. What my family produces is sold at my farm gate, which minimizes transportation costs and spoilage during transportation. Monthly, my family earns about 1300. 00 birr from the sale of vegetables. However, my family is disadvantaged since we are not getting the consumers directly. It is this income which helps my family to purchase other food items, clothes, to cover education fees and the likes otherwise we would have nothing. Now my family is better at least we have some thing to eat through what we produce.*

## (II). Dairy farm

Similarly dairy farmers have shown a dramatic improvement in their household income due to their engagement in dairy farming. Accordingly, 60% of farmers indicated that their monthly average income is greater than 1800 Birr, while 12 % of them reported that their incomes are between 1401-1800 Birr and 28% of them indicated that their incomes are in the range of 1000 to 1400 (see Table 19).

**Table 19.** Income of the sample households per month

Income category birr per month	Frequency	Percentage
1000-1400	8	28
1401-1800	4	12
>1800	18	60

Source: own survey (2008)

Furthermore, cross tabulation was made with a number of cattle they have to the income they generated. Accordingly, majorities of household who possessed one cow were found to have income category of 1000-1400 Birr. While, households who have more than one cows were found to generate an income greater than 1401 Birr/month. This result may show that number of cows in the household is directly related to the amount of income that the household reap (see Table 20).

**Table 20.** Income category by the number of cattle the household have

Income category	Birr/month	Number of cow		
		One	Two	> Three
	1000-1400	6(20)	2(6.7)	-
	1401-1800	2(6.7)	2(6.7)	-
	>1800	3(10)	12(40)	3(10)

Pearson Chi-square 0.123 P-value 0.045

Source: Own survey 2008

## **4.5. Challenges of UA**

Different researchers have mentioned a range of constraints prevailing in UA activity in general, in vegetable production in particular. This sub-section illustrates the major challenges that are indicated by vegetable producers such as land ownership problem, land size, market problem, health problem, lack of policy and other inputs. Table 21 portrays that from the total of sample households, 82.9% of the farmers indicated that in one way or another they have faced a number of challenges.

### **4.5.1. Challenges of land ownership among vegetable producers**

Of the total farmers who have revealed that they have faced some sort of challenge in their work, 20% of them indicated that their challenge streamed from land ownership problem, which is significant at 10% level (see Table 21). That means there are significant numbers of farmers who are experiencing lack of land ownership which could affects the level of food security and income that they can generate. This result is supported by Drechsel et al (2002) which say that insecurity of land tenure is a crucial problem in urban agriculture for it discourages urban farmers from investing more resources which in turn limits their potential to produce efficiently.

The FGD further reason out feeling of tenure insecurity emanated from the fear that their land could be given to investors or may be taken by the government for its priority projects. As they do not have a legal bases according to land certificate provision, to confront governmental encroachment to their land. This has been attested by the KII that the cooperative land size has diminished by more than 2 hectares within the space of two years due to projects such as road expansion and other activities, which affect the volume of the farmers' production and the income that they could possibly generate. The FGD further see the threat that unless they secure the land they are operating on, they soon run under complete lose of land to work on.

**Table 21.** Challenge faced in vegetable producer by land ownership

		Do you have land ownership problem?		Total
		YES	NO	
Have you ever faced challenge in UA?	YES	14(20)	44(62.9)	58(82.9)
	NO	0	12(17.1)	12(17.1)
Total		14(20)	56(80)	70(100)
Pearson Chi-Square 3.621				
p-value 0.057				

Source: Own survey 2008

The following case obtained from the same cooperative member corroborates with the above fact that lack of ownership of farm land had led them to loose the opportunity to use the land for other interests they have, as it is depicted below.

**Box-5. Case Study-Debebe N**

Mr. Debebe 62 has been working in the vegetable production since 1965 for the past 43 years. He lived with his wife and 9 children. He explained his bitter feeling about the land ownership problem as follows:

*Before the proclamation of land to the tillers I was working as a tenant to the land lord, which exploited all my young age time labour. My potential to accumulate asset and to posses my own land has been wasted during the Emperor regime. However, during the Derge regime I have got to posses my own land just to produce and use that does not secured me to own it privately. In the current regime though the cooperative has a legal status my land has been given to investor. It is really a threat to every one of us who are working in UA activity in the future to secure our livelihood. Though I am given land replacement by the cooperative as compensation, it is far from my home. I am seeing that one day the cooperative will run out of land to compensate to the members if the right to own land is not secured.*

Debebe see that the limitation imposed by their cooperative to use the land only for vegetable purpose as against to natural interest of them to use the land for better advantage income generating activity.

For instance, “we should be allowed to use the land in any productive area which we think is viable for us like for house building and renting, khat and crop cultivation” said Debebe anxiously. He further complained that his friends who are not working in UA are building house for renting and selling at a very high price. “It is really injustice and unfair for us to be judged that the land should be used for vegetable, activity only” as Debebe complained.

#### 4.5.2. Land and labour shortage challenges

##### (I). Vegetable production

Nearly half of the sample households, who have revealed that they have not faced challenges in vegetable farming activity, do not show that they have shortage of cultivable land. However, 5.7% of the sample households who have indicated that they have not faced any challenge have shown shortage of land. The Pearson chi-square correlation coefficient shows that insignificant number of the producers indicated lack of sufficient arable land as a challenge to their UA activity (see Table 22).

**Table 22.** Challenge faced in vegetable producer by arable land

		Do you have sufficient arable land?		Total
		YES	NO	
Have you ever faced challenge in UA?	YES	23(32.9)	35(50)	58(82.9)
	NO	4(5.7)	8(11.4)	12(17.1)
Total		27(38.6)	43(61.4)	70(100)
Pearson Chi-Square 0.168				
P-value 0.682				

Source: Own survey 2008

The study further disclosed that the farmers do not own same quality of land though each of the cooperative member posse’s equal size of land. There are three different types of land quality in the cooperative. These are rank one which is assumed to be as fertile land, rank two semi-fertile lands and the last rank has a soil type which can hardly be used for production, for it has thin layer of soil as well as rugged nature of plot. This disparity in

the quality of the land among members might induce differences in the volume of their production and the benefit that they obtain. At the same time there are families who are parceling out their farm to their children, which can in turn deepen the problem of lack of sufficient land as the and FGD revealed.

The following individual case study further elicits the aforementioned results that are generated from the survey and group discussions about lack of sufficient farm size being a threat to large families.

#### **Box-6. Dendir's Experience**

Mr. Dendir, 50 is a vegetable producer in Nifas Silk Lafto sub city. He has 15 family members of which four are his relatives. Dendir has been in the present residence since 1968. "It is a life time experience" he said accompanied by a smile. Currently, Dendir and his family have 2000 sq.m plot of backyard gardening. "Before the proclamation land for tillers' in 1976, I practiced share cropping with the landlord. Later I owned the present plot of land after the declaration" said Dendir.

Dendir produces lettuce, beet root, carrot, Swiss chard, cabbage and so on. He assured that there is no problem of market. Hence, vegetables are widely used during fasting seasons. Dendir produces the aforementioned vegetables twice per year. During summer water logging is the main problems he and others face.

"This is my permanent job; we produce for sale and household consumption, which covers all others expenses of my family such as education, health, cloth and other food staffs" said Dendir. As far as farm size is concerned, Dendir asked his question as follows:

*Is that not difficult to sustain life on 2000 sq. m backyard plot for large family having household like me? In deed it is very difficult. If I had a bit larger land I would have been teaching my kids in a better school, changed my family life standard and changed my own cloth to wear.*

The study further investigated by cross tabulating lack of sufficient land and the gender of the household head, which was found to be a significant and strong Pearson chi-square correlation. According to Table 23 below, 73.2% of the male headed households indicated lack of sufficient land to cultivate while only 14.3% of female household heads

complained of the insufficiency of land. This disparity could be explained by the presence of higher labour in male headed households than in female's, which needs more land to work and effectively use their labour.

**Table 23.** Gender by sufficient arable land in the sample households

		Do you have sufficient arable land?		Total
		YES	NO	
Sex	Male	15(26.8)	41(73.2)	56(100)
	Female	12(85.7)	2(14.3)	14(100)
Pearson chi-square 16.415				
p-value 0.000				

Source: Own survey 2008

The study further pin down that urban vegetable producer faces shortage of labour. According to the study 65% of them stated that labour shortage is one of the main problems that is obstructing them from producing more.

The discussion held with FGD further amplifies the challenge of labour shortage. Accordingly, the cost of hired labourer is springing up every time. As one participants of the FGD, in his late 50's, explained the labour constraint as follows:

*Previously we used to get labourers with a reasonable cost. However, after the construction sector has shown a high scale of boom all labourers who used to work with us shifted to construction sector where they are better paid. It would also be nice if I could pay the same but I cannot afford that. How can we pay 25 or more birr for a day? Even we cannot get that much on a day.*

## **(II). Dairy farm**

Similarly, dairy farmers have indicated a high degree of challenge in the lack of sufficient space, particularly grazing land and barns. The situation was also more exacerbated by lack of labour. In most instances it is explained by the high cost of labourers. Accordingly, 75% of the sample households have revealed that shortage of ranching land has forced them to use zero grazing methods, which exposes them to high costs of fodder. It is difficult to feed enough to the cattle. As a result, the productivity of the farmer is negatively affected.

At the same time the zero grazing has a parallel effect on health problems and complaints from neighbours of noise pollution and bad smell. As one participant in FGD has indicated the scenario:

*I have 7 cattle; I do not have enough space even to have good zero grazing. At one time I was forced to stand in the court with my neighbour accusing me of polluting the neighbourhood with bad smell.*

Based on the result obtained from the sample survey, 50% of participants have divulged that labour shortage is chronic for the fact that the cost of labour is increasing with the increase in cost of living. The organized FGD attest the same fact that the increase in the cost of labourer is affecting them. One of the participants whose age is estimated to be in the beginning of his 60's said the following:

*I used to hire more than three labourers with the cost that I am currently hiring a single labourer. However, these days I cannot afford to pay them a cost equivalent to what I use to pay for three of them. As a result, I am facing a serious problem of effectively carrying out my job.*

Thus, the increased cost of labour has brought urban farmers a considerable constraint which can hamper their productivity significantly.

#### **4.5.3. Market challenges**

##### **(I). Vegetable production**

Table 24 depicts the fact that 61.4% of the sample households have market problem. As to their primary reasons 34.9% of them indicated the lower price for the vegetables they produce was the main cause; 32.6% of them cited the poor habit of the society to consume vegetables result in poor demand; 23.3% of them blamed the middle men; while only 9.3% of them indicated lack of market place to sell their products as the main cause. The FGD further consolidated the fact that as the farmers are not getting the products to the consumers directly, they are exploited by middle men and brokers. The farmers have expressed their grievances as follows:

*We are not getting enough profit from our work. It seems that half of what we are producing is given for the benefit of middle men and we only get the other half with out including the expenses for the inputs we use.*

Furthermore, the FGD and KII pointed out that during the former regime the cooperative used to have 25 shops in each *Woreda* and they were not charged for rent. However, since 1994 they were asked to pay Birr 89 per month for a rent. Since 1999, however, the rent dramatically increased to Birr 1400 per month. As a result they were incapable to pay and forced to evict from what they use to own for free. Thus, this significantly hinders them in not benefiting from their labour.

**Table 24.** Market problem

		Frequency	Percent
Do you have market problem?	YES	43	61.4
	NO	27	38.6
	Total	70	100.0
Type of market problem			
		Frequency	Percent
Reason for market problem?	Lower price of vegetable product	15	34.9
	Lack of habit of vegetable consumption by the people around	14	32.6
	Lack of market places	4	9.3
	Price manipulation by broker	10	23.3
	Total	43	100.0

Source: Own survey 2008

## (II). Dairy farm

The absence of a market for milk and the low price of milk during fasting periods are two of the major constraints that the dairy farmers are facing in relation to marketing problems.

Accordingly, 45% of the sample individuals indicated that there is no market place for milk. In addition, 55% of them indicated that the price of milk dramatically declines during major fasting seasons. As to the FGD organized reveals,

*If we do not agree with the price of milk that contactors provide us, we do not have any other place to sell milk. As a result, we are compelled to sell to them bear the disadvantage.*

Hence, the culture of the society and the lack of market place for milk subjected them to lose their advantage that they could reap from their farming. In addition, it may be difficult for them to cover the cost needed for purchase of fodder.

#### **4.5.4. Inputs problems**

This sub-section presents constraints that are related to vegetable production such as fertilizer, hoe, and improved seed as well as those that are pertinent to dairy farming like drug, fodder, and so on.

##### **(I) Vegetable production**

As to the input constraint that the farmers face, all the sample households disclosed that they have been experiencing one or more types of input constraints. As to a particular type of challenge they face, 21.4% of them indicated a lack of good and durable hoe which can be used in all seasons. As the FGD and KII complained the quality of currently available hoe by the private firms are not good as compared to what previously provided by the ministry of agriculture. On the other hand, 15.7% of them have revealed that they had lack of fertilizer. Though the cooperative provide them with fertilizer they still have lack of money to purchase it as it was witnessed by the FGD. In addition, 21.4% of the sample households portray that they have lack of improved seed, and even though such seeds are made available by the cooperative low financial status of the farmers limits them from purchasing it. However, 41.4% of the sample households depicted that they have all the above discussed problems (see Table 25).

**Table 25.** Constraints of input use

	Frequency	Percent
Hoe	15	21.4
Fertilizer	11	15.7
Improved seed	15	21.4
All	29	41.4
Total	70	100.0

Source: Own survey (2008)

## (II). Dairy farm

There are three categories of capital inputs which can be identified in TMPMSC cooperative. The first category consists of inputs directly related to the rearing process, either as part of the feeding requirements, or related to animal health. The second category consists of equipment and is mainly concerned with the housing conditions in which the cows are kept and the equipment used in the product processing. The third category is money drawn from family resources or other formal or informal sources to expand their activity.

**Table 26 .** Use of inputs in livestock production and its challenges

Inputs	Frequency	Percent
High price of veterinary drugs	25	83.3
Availability of Modern milk processing machine	4	13.3
Sufficiency of space for animals	10	33.3
High price fodder supply	23	76.7
Availability of extension service	25	83.3
Lack of Hired labour	15	50

Source: own survey, 2008.

According to Table 26, 83.3% of the dairy farmers complained that the prices of veterinary drugs are not reasonable. This was due to a withdrawal of government from providing drugs that was some how subsidized for them. Moreover, 76.7% of that farmer indicated that there is a sky rocketing price for fodder. This is due to the stiff competition

faced with animal fattening farms with a better capital. Only 33.3% of the sample households indicated that they have sufficient space for keeping their cattle, which means that majority of the farmers do not have sufficient space. Eighty three percent of the respondents complained for unavailability of extension assistance when they need them (see Table 26). Which is due to the restructuring of urban agriculture office of Addis Ababa. the number of extension worker were declined due to education background qualification problem. As to the FGD, the dairy farmers are glad to get the support of the extension workers for the future because their assistance in the past had made great improvement in the overall production.

As the cooperative head indicated and as attested in the household survey, the entire participants in dairy farming used improved cow breed. However, the FGD further unveiled that the quality of the dairy farm differs from household to household. Some of the members have the best quality cow which can give up to 15 liters of milk per day while others use breeds that are only capable of giving 7 to 4 liters per day.

The FGD interview further portrays the fact that dairy farm producers are facing considerable high cost in fodders and insufficient space.

*No words can express the sky rocketing price of fodder. The price of hay is high and often difficult to afford. For instance one barrel by products of molasses juice is about 330.00 birr that is if at all it is obtained. The price of other feeds has also risen alarmingly these days. These days we seldom get labourers as they prefer other works like construction for they are better paid there. Lack of sufficient space has also hampered me from increasing more cattle so as to increase my dairy production. Thus, all the above deter the benefit we can obtain.*

#### **4.5.5. Health and environmental challenges**

##### **(I) Vegetable production**

Vegetable production within the city is believed to have some kind of negative effect on the environment. Nonetheless, it has been strongly argued by the KII that:

*The area in which the vegetable producers are now working is meant for a green area of the city. However, there has been a radio announcement which stated that*

*vegetable produced using polluted water can create health problems among vegetable consumers in the city. That significantly affected our vegetable acceptability in the market in relation to health issue for awhile.*

In addition, the FGD participants argue against the critics of UA as follows.

*Why and how could our activity be considered as harmful to the environment while we are changing a wasteland, into a productive area? We have changed a garbage throwing area into a productive farm. We are conserving the area through constructing terraces which would have been eroded. Besides, as the extension worker advised us we do not use pesticides for we know it is an endangerment to the environment. Above all we should not be the ones to be blamed for the pollution to the environment because the main pollutants are industries and those people that are sending their sewage in to water bodies.*

This result is against the study obtained in Dar es Salaam, Arusha, and Dodoma which found that the use of pesticide was widespread and the effect is quite tremendous (Yachkaschi, 1997). However, the study conducted by UNDP (1996) indicated that UA has a significant impact in improving the urban environment by making use of waste for productive purposes. Similarly, Axumite (1994) revealed that the fact that UA uses recycled solid and liquid wastes provides some benefits to ecological sustainability.

Unlike what has been argued by the FGD, the KII has unveiled their fear by saying “vegetable production may not be free of chemical utilization like fertilizers, which can harm the environment.” However, the amount that they use matters on the severity of the damage that vegetable production brings to the environment.

Lack of education of the farmers on how to protect themselves from hazardous effluents and communicable disease was also one of the major problems to health. As it has been witnessed by FGD and KII, most of the framers are experiencing skin rashes, skin cracking and asthmatic problems.

The FGD further argued that during rainy season people from upstream and the near by farm vicinity connect toilet pipeline with the water body, which exposes them to communicable disease such as typhoid, diarrhea and the like. This mainly becomes a

problem during the rainy season when most of their plot is flooded in which case increases their chance to be contaminated. Furthermore, they have explained that during such times most of their time is elapsed by cleaning their farm from trashes, plastics and other waste materials that the flood brought along.

The following case study further disclosed that working on vegetable production using the water that is diverted from the river has considerable health problems.

#### **Box-7. Bedaso's Views on Environmental Impacts**

Mr. Bedaso, 65 a year old household head has been practicing vegetable production and marketing since 1967 in Nifas Silke Lafto sub-city. Bedaso has six family members. Bedaso's family makes a living on their backyard 2000 sq. m by planting vegetable. He said that his family's sole means of livelihood has faced a number of constraints.

*Here we are working in a high health risk situations. Specially, during rainy season when the volume of water increases liquid from toilet, hospital, big tannery factories and food processing is discharged with the water. As a result, it is very difficult to work using such kind of contaminated water. I and my family experienced a sever health problem because we have worked under such condition. My family and I had a prolonged skin rash, etching and food poison problems. My families have been subjected to a number of health problems which forced me to incur a huge amount of treatment cost.*

#### **(II). Dairy farm**

According to the organized FGD and KII understanding, dairy farming has a negative impact because it causes a threat to the environment and to human health. The FGD is very much aware of the environmental impact that livestock are creating. As the disclosed, livestock particularly cattle destroy vegetation, create erosion when there is a free grazing system. can create mess particularly due to animal dung, produce bad smell and noise which in turn disturbs neighbours.

On the top of that the sample households were also asked about awareness regarding a number of more specific threats: disease, discomfort, noise and smell. The majority of the respondents, 70% agreed that raising cattle has a threat to health. The organized FDG revealed the fact that the main disease that the people facing is tuberculosis. It has been attested by Rabinovitch & Schmetzer (1997) that lack of harmonization of urban livestock, horticulture or forestry systems can harm the environment through the accumulation of animal waste. As FGD disclosed, non-farming neighbours complain for visual messes, dust, smell and noise created by the urban farms.

#### **4.5.6. Theft Problem of vegetable producers**

The FGD further reveals that they have been exposed to a number of theft crimes, which sometimes exposed them to a total loss of their products over night.

The following case consolidates the above fact that theft has become a very common problem which the farmers are subjected to endure.

#### **Box-8. Zeberga's experiences of theft**

Mr. Zeberga, 57 is a vegetable producer in Nifas Silk Lafto sub city. He has 8 family members. Zeberga has been in the present residence since 1975 G.C. Zeberga and his family own 2000 sq.m plot of backyard gardening.

He has experience a number of theft problem that he explained as follows:

*"I have been exposed to four major theft crimes in which one of the theft act exposed me to a total loss of my ripened vegetables. The theft act was more pronounced in my plot for they might know that I am dwelling far from my farm and that the location of my plot is on the road side. It is extremely annoying and makes you hopeless if you are exposed to such crimes."*

#### **4.5.7. Policy related problems**

On the basis of the decision of the City Government of Addis Ababa, Urban Agriculture has already been included in the master plan of the five years development program of the city. However, there is no clearly stated urban agriculture policy intended to meet the

specific objectives formulated by involving different stakeholders responsible for urban agriculture development and enhancement. The lack of clearly stated policy has hampered access to land, right to use the land and controlling on river pollution, as the KII argued. .

Furthermore, failing to identify the actual areas or land allocated for urban agriculture in the master plan has caused conflict between different groups among the stakeholders as argued by participants in FGD and KII. Thus, the absence of the above elements may some how hamper the future prospects for the people who base their livelihood directly and indirectly on UA. Thus, the benefit expected to be obtained will not materialize as De Lardemelle (1996) strongly argues.

#### **4.5.8. Issue of Sustainability**

All the major contributions and challenges of urban agriculture in the study area (Nifas Silk Lafto Keifleketma), has been discussed in the previous sections. This section underlines the issue of sustainability. Accordingly, the study underscore that urban agriculture has contribution for employment opportunity, income and food supply.

The contributions some how indicates the continuation of its sustainability for some of the households. However, some households were very much skeptical to the situation of UA sustainability due to different reason that they faced. Some says UA will not be sustainable to them as there is shortage of grazing land, tenure insecurity and shortage of land, lack of policy as to how UA will be managed and sustained and the negative impact of UA on environmental quality particularly in dairy faming. Other are sensing that unfair market situation is one challenge that may push them to withdraw from the activity. All the above will shed light in the sustainability of UA unless remedial actions are taken to support the livelihood of people who are engaged on it.

## Chapter Five: Conclusions and Recommendations

### 5.1. Conclusions

The ultimate objective of this study is to identify the benefits and constraints of vegetable producers and dairy farming in Mekenisa Gofa-Saris Vegetable Producers and Marketing Service cooperative (MGS-VPMSC) and Tenachin Milk Producers and Marketing Service Cooperative (TMPMSC) in Nifas silk lafto sub-city. To this end, the thesis has looked at the research questions of the study and has given the picture of the issues.

The study found that the participants have got different inspiring reasons to engage in vegetable production as well as in dairy farming. However, the most rated response that was given to their engagement was for income generation and own consumption. In this regard, female households were purely engaged for income generation activity while more than 42% of the male household heads were engaged for employment generation. This implies that there is a high tendency in male households to engage in UA during unemployment than in female households. This disparity between genders of the household heads probably indicates that being employed is more needed in male households than in female household heads. That may be the case why majorities of the households indicated that they will not give up their job even if they have good income earning mechanism.

The study also found out that most of the households have shown improvement in their food security status upon the engagement in vegetable production as well as in dairy farming. Nevertheless, male household heads performed better in food security status than their women counter part. This could be explained by the availability of higher labour in male households than in female household heads. Or else male households may be engaged in additional income generating activities more than female household heads do.

Furthermore, the study found out that the income of households have increased substantially after their engagement in vegetable as well as in dairy farm production, which in turn helped these households to have better purchasing power, and to save money. Accordingly, the income that male households obtained from vegetable production is higher than that of their counter part, which could be explained by the experience that the two groups have in farm activity or due to the high labour availability in male households. In addition, it was witnessed that vegetable production has helped the farmers in improving and greening the environment while dairy farming has aggravated environmental problems.

As to the contribution of dairy farming to the households were creating employment to the hired labour as well as to the member of the households, which in turn improved the livelihood of the people. There has been significant improvement in the food security of the dairy farm producers, though, it has been observed that there is a strong correlation between the number of cows and the food security status of the households. Besides dairy farming brought considerable improvement in the income level of the households, this is directly related to the number of cows that the household owned.

The study has also identified some of the obstacles faced by vegetable producers and dairy farmers. To begin with, lack of land ownership was a problem apart from the license that they are given from the government. This hinders the opportunity to produce. Besides, relatively large numbers of male household heads complained about the smallness of the plot on which they are working as compared to female household heads. The study also found out that market problem exacerbated their problem. Because of the poor vegetable consumption habit of the people, vegetable products are cheap in the market. On top of that middle men create unfair market situation which even worsens the situation of the farmers.

Furthermore, lack of inputs such as proper hoe, money constraint to purchase fertilizer, and improved seeds seems to deter their productivity. The high rate of contamination and pollution of the water that vegetable producers use has brought them a serious health problem, which forces them to incur additional cost. On top of the above facts, lack of urban agriculture policy also hampered access to land, right to use the land and regulation on level of water pollution.

The study also found out that dairy farming also faced a number of challenges. Accordingly, the sky rocketing fodder price increase in quite short period of time has hindered dairy farmers from producing effectively. In addition, labour shortage, diseases/death of animals, lack of clean and sufficient space and lack of capital to purchase drug, fodder and improved cows have deterred them from materializing their full capacity to produce and benefit.

## **5.2. Recommendations**

Some of the problems identified are acquiescent in short term policy interventions and in medium term while some could only be achieved in long term. Accordingly, as per the findings of this study the following recommendations need to be considered:

- ❖ Lack of land ownership hinder the farmers' potential from meeting their food security, and affects the farmer's ability from using other viable options they have. Thus, in order to realize better food security and to make their investment sustainable to the environment it is needed to secure the land they own.
- ❖ To maximize the benefit that the farmers obtain from a small plot it is needed to adopt new technologies that maximize their potential to produce on the land: through labour intensification, improved seeds and fertilizer. In addition, creating financial capacity through provision of credit is important to give them a purchasing power for rudimentary inputs.
- ❖ Farmers entirely make use of irrigated water which is susceptible to contamination and industrial pollution. Thus, it is essential to create awareness (educating farmers) among farmers in order to avoid possible health problems. Besides, it is needed to introduce less costly protecting gloves which can minimize possible infections that could be caused by pathogens and other irritating pollutants. In addition it is vital to initiate applied researchers in waste water re-use. On top of that periodic testing of soil and water quality in urban areas; definition of norms regarding types of crops that are allowed on soils with specified levels of contamination (especially heavy metals) is essential.
- ❖ Lack of a clear urban agriculture policy that links different stakeholders that may secure land ownership, grant access to land and determine the level of water pollution can significantly and negatively affect the benefit that could be obtained. Thus, a clear policy is needed that can link different responsible stakeholders, that can ensure the use of green area for UA based on the master plan of the city administration and that includes the threshold level of effluent discharge from factories to the water body.
- ❖ An improvement in the market situation is needed in order to help producers to realize the best out of what their work. This includes creating a means in which the producers could directly get consumers, having a proper market place with a fair price and also raising consumers' awareness with respect to the habit of vegetable consumption is important.

For good production of dairy farming, input like fodder is an essential thing. However, with the sky rocketing price of fodder it is difficult to sustain the benefit of farmers. Thus, it is important to have lower price fodder from elsewhere and to identify the seasonal availability of low price fodder by their cooperative to meet the need of the farmer. Furthermore, it is also important to make fodder from local available materials. For instance, using vegetable residue by way of creating link between vegetable producers and dairy farmers, where the dairy farmers could possibly share compost.

- ❖ Extension workers can possibly curb animal death problem and can also create awareness on the improved high quality cows so that dairy farmers can improve their livelihood. In addition, enough space and area which having little environment problem causing place is important to make dairy farming sustainable.

## Reference

- Anton, D. 1993. Thirsty cities: urban environments and water supply in Latin America. International Development Research Centre: Ottawa, Canada. pp 204 .
- Axumite G & Egziabher. 1994. Urban farming, cooperatives, and the urban poor in Addis Ababa. Axumite et al.. Cities feeding people: An examination of Urban Agriculture in East Africa. Pp. 85-104. IDRC: Nairobi Ottawa.
- Barrows, R. & Kisamba-Mugerwa, W. 1989. Land tenure, access to land, and agricultural development in Uganda. Land Tenure Centre, Madison, WI, USA.
- Bowyer-Bower, F.A.S., Mapaure, I., & Drummond, R.B. 1996. Ecological degradation in cities: Impact of urban agriculture in Harare, Zimbabwe. *Journal of Applied Science in Southern Africa* 2(2): 53-68
- Braatz, S. 1993. Urban forestry in developing countries: status and issues. In: Proceedings of the sixth national urban forestry conference, Minneapolis, Minnesota, September 14-18, 1993. p 85-88.
- Brook, R.M., & Davila, J.D., eds. 2000. *The peri-urban interface: A tale of two cities*. London: University College, Development planning unit, and university of Wales, School of Agriculture and Forest Science.
- Carter, J. 1993. The potential of urban forestry in developing countries: a concept paper. Rome: FAO.
- Cofie, O.O., Veenhuizen, R.V and Drechsel, P. 2003. Contribution of urban and peri-urban agriculture to food security in Sub-Saharan Africa. Paper presented at the Africa Day of the 3rd WWF in Kyoto, 17:3.
- CEDAR .1999. Inception Report. R7330: Peri-urban natural resources management at the watershed level, Kumasi, Ghana. Royal Holloway University of London: Kumasi.
- Chimbowu, A. & Davison, G. 1993. Urban agriculture research in East & Southern Africa II: records, capacities and opportunities. Cities feeding people series no. 4. IDRC : Ottawa.

- CSA. 2004. Socio-economic and demographic report on Addis Ababa city Administration.
- Deelstra, T. 1999. Urban agriculture and city ecology. Paper presented at growing Cities Growing Food Workshop, Havana, Cuba, October 1999.
- De Lardemelle, L. 1996. The Role of Local authorities in the Food Supply and Distribution Systems in Ghana. Food into Cities Collection, FAO: Rome.
- Diallo, S. 1993. Urban agriculture research in West Africa: Record, capacities and opportunities. Ottawa. IDRC. Cities feeding People Series, Report no.5.
- Drakakis-Smith, D. 1990. Food for thought or thought about food: urban food distribution systems in the Third World. *In* Potter, R.B.; Salam, AT, ed. pp. 100-120. Cities and development in the Third World. Mansell: London, UK.
- Drechsel, P., U.J. Blumenthal and B. Keraita. 2002. Balancing health and livelihoods: Adjusting wastewater irrigation guidelines for resource-poor countries. *Urban Agriculture Magazine* 8: 7-9.
- Egal, F; Valstar, A & Meershoek, S. 2003. Urban Agriculture, Household Food Security and Nutrition in Southern Africa.
- Essamuah, E. and Fonah, S. 2004. Coping with urban poverty in Ghana: An analysis of household and individual livelihood strategies in Nima/Accra. Legon. *Journal of Sociology* 1 (2): 79-96.
- Foeken, D., Sofer, M., and Mezi, M. 2004. Urban Agriculture in Tanzania. Issues of sustainability
- Freeman, D.B. 1991. A city of farmers: informal urban agriculture in the open spaces of Nairobi, Kenya. McGill-Queen's University Press: Montreal, QC, Canada.
- Flynn-Dapaah, K. 2002. Land negotiations and tenure relationships: Accessing land for urban and peri-urban agriculture in Sub-Saharan Africa. CFP Report Series 36. IDRC: Ottawa.
- Gilbert, R. J., de Louvois, J., Donovan, T. 2000. Guidelines for the microbiological quality of some ready-to-eat foods sampled at the point of sale. *Communicable Disease and Public Health* 3 (3): 163-167

- Gyamfi, A.A. 2002. Commercial irrigation farming. In: Sally, H and Abernethy, C.L. (eds.) Private irrigation in sub-Saharan Africa. IWMI-FAO-CITA. Proceedings of a regional seminar 22-26 Oct 2001, Accra, Ghana; pp. 151-155.
- IPS. 2007. Addis Ababa City Government Investment Authority Resource and Opportunity Study. Project Identification, Selection and Profile Preparation Part I Vol. VI- Urban Agriculture.
- Konijnendijk C. 1999. Urban forestry in Europe: a comparative study of concepts, policies and planning for forest conservation, management and development in and around major European cities. University of Joensuu, Faculty of Forestry.
- Lee-Smith, D.1994. Cities feeding people: An examination of Urban Agriculture in East Africa. IDRC: Ottawa.
- Loods, S. 1998. "Productive Use of Open Spaces in South Africa", International Conference Papers, Technikon, Pretoria.
- Madihi, M.C.1991. Total employment in the informal sector. *In 1991 National information sector survey, pp 5-12*. Planning Commission Dar es Salaam.
- Maxwell,D.G. 1994. Cities feeding people: an examination of Urban Agriculture in East Africa. IDRC: Ottawa.
- Maxwell, D., and Zzawa, W., ed. 1992. Urban Agriculture in Africa: The Case of Kampala. ACTS Press: Nairobi, Kenya.
- McGregor, D., Simon, D. and Thompson, D. 2002. Peri-urban natural resources management at the watershed level: Kumasi, Ghana. Final Technical Report for DFID project R7330. CEDAR-IRNR, Royal Holloway University of London: London.
- Mc Pherson, E.G. 1994. PRA and PM&E: some issues arising from a review of the existing literature. Institute of Development Studies (IDS), University of Sussex, Brighton, United Kingdom.

- Mensah, P., D. Yeboah-Manu, K. Owusu-Darko and A. Ablordey. 2002. Street foods in Accra, Ghana: how safe are they? *Bulletin of WHO* 80: 546-554.
- Molzi, M.R. 1998. Urban vegetable production in low density areas of Dar es Salaam. Urban vegetable promotion project: Dar es Salaam.
- Mosha, A.C. 1996. Urban Agricultural Activities in Tanzania. *In Review of Rural and Urban Planning in S & E Africa* pp.83-92. Vol.1.
- Mougeot, L.S. 1999. The hidden significance of urban food and nutrition security in the developing world. Focus 3 brief. 10 August 1999. Washington: IFPRI
- Nelson, A., Abdel-Halim, A. and Hussein, R. 1996. Baseline Study on Urban Agriculture in Tamale Municipality. Faculty of Agriculture, University for Development Studies: Tamale.
- Rabinovitch, J. & Schmetzer, H. 1997. Urban agriculture: food, jobs and sustainable cities. *Agriculture and Rural Development* 4 (2): 44-45.
- Rees, W. 1997. Why urban agriculture? Notes for the IDRC Development Forum on Cities Feeding People: A Growth Industry. Vancouver, 20 May 1997.
- Sayanli, C. 1985. Urban Agriculture: Who cultivates and why? A case of Lusaka, Zambia. *Food and Nutrition Bulletin* 7(3):15-24.
- Sawio, C. 1993. Urban Agriculture Research in East and Central Africa: Record, Capacities and Opportunities. CFP Report 1: Dar es Salaam.
- Smith, O.B. 2002. Overview of urban agriculture and food security in West African cities. In: Akinbamiyo, O.O., S.T. Fall and O.B. Smith (eds.). *Advances in crop-livestock integration in West African cities*. ITC-ISRA-IDRC. Printed by Grafisch Bedrijf Ponsen en Looijen B.V., Wageningen, p. 17-36.
- Stevenson, C., Xavery and Wendeline, A. 1996. Market production for fruit and vegetables in the peri-urban area of Dar es Salaam. urban vegetable promotion project: Dar es Salaam.

- Storck, H. Bezabih Emmana, Birhanu Adnew, Borowiecki, A. & Schmelis W/Hawarit.1991. Farming systems and farm management practices of small holders in the Hararghe highlands. Farming systems and Resource Economics in the Tropics, Vol. 11.F.R. Germany: Wissenschaftsverlag Vauk Kiel.
- UN Population Division. 2004. World Urbanization Prospects: The 2003 revision. Department of Economics and Social Affairs, United Nations. New York, USA.  
<http://www.un.org/esa/population/publications/wup2003/WUP2003Report.pdf>
- UNDP.1996. Urban Agriculture: Food, Jobs and Sustainable Cities. UN Development Program, Publication Series for Habitat II, Vol.1. UNDP: New York, USA.
- UN-Habitat. 2001. Cities in a globalizing world. Global Report on Human Settlements 2001.UNCHS Earth Scan Publications: London.
- Yachkaschi, J. 1997. Urban and peri-urban production, marketing system and consumption of fruit and vegetables in selected cities in Tanzania. Urban vegetable promotion project.DaresSalaam.
- Zelalem Girma 2005. Determinants of sustainable rural water supply system in Ethiopia: the case of Two Rural water supply System in Amuye Serra and Habru seftu schemes. Unpublished M.A Thesis presented at school of graduate of AAU department of RLDS.

## Appendix

Table .A1. Conversion factor used to estimate Adult equivalent Person(AEP)

Age category(Years)	Male	Female
Less than 10 Years	0.00	0.00
10-13	0.20	0.20
14-16	0.50	0.40
17-50	1.00	0.80
Greater than 50	0.70	0.50

Source: John (1982), R. Ithenberg (1983), Nair (1985) and Here (1986); as cited in Storck et al.(1991)

### Vegetable producers Questionnaire

#### I. Household Characteristics

1. Household head name -----
2. Sex of the household 1. Male 2. female
3. Age
4. Number of family size-----
5. Education level of HH
6. Ethnicity

Number of children	Sex	Age	Education status

#### II. REASONS FOR ENGAGEMENT IN VEGETABLE PRODUCTION

7. What make you to engage in vegetable production
  1. Low income level
  2. unemployment
8. Is low income your reason for engagement in vegetable production
  1. Yes 2. No
9. If No to Q.8, do you continue the vegetable production where there is no economic stress?
  1. Yes 2. No
10. If yes to Q.8, what is the reason for continuing vegetable production where there is no economic stress?

1. It is life necessity
2. Unemployment fear
11. Reason for vegetable production
  1. for own consumption
  2. for sale
  3. for both sale and consumption
12. What type of Horticulture of Crop you produce
  1. Cabbage 2. Lettus 3. Tomatto 4. fosolia 5. carrot
  6. Others specify
13. Do you think your and your family life has changed because of your engagement in vegetable production?
  1. Yes 2. No
14. If yes to Q. 13 above, in what manner it changed you life?
  1. By getting income
  2. By getting food to eat
  3. Employment
  4. All
15. If no to Q. 13 above, what do you think is the reason in not benefiting much?
  1. Lack of sufficient land
  2. Lack of inputs (fertilizer, improved seeds etc)
  3. Lack of market
  4. Threat of pollution
  5. legal frame work
  6. others specify

### Opportunities of UA

#### III. UA and food security

16. Is your household food security improved as the result of your engagement in UA?
  1. Yes 2. No
17. If Yes to Q. 16 above, in what manner it changed?
  1. Assured at least three meals a day
  2. Variety of food assured cheaply
  3. Not that much significant
18. If No to Q. 16 above, what is the reason for not improving your food security?
  1. Because of the cheap products that I am producing
  2. It is only subsistence that I produce
  3. The poor consumption patter of the society

#### IV. UA and Income

19. Is the household income changed due to UA engagement?
  1. Yes 2. NO
20. If yes to Q. 19 above, can you give information of your yearly/monthly income that you obtained from vegetable production?----
21. Is that low income level of the household that subjects you to start UA?

1. Yes 2. No
22. If Yes to Q. 21 above, due to think you will continue to working UA if there is no more economic stress or change in income of the household?
1. Yes 2. No
23. If No to Q. 21 above, why do you do it?
1. It is due to my necessity  
2. due to unemployment  
3. Others specify
24. What benefit you obtained from vegetable production?
1. It created employment opportunity  
2. It helps me to be self sufficient in food  
3. Income generation  
4. Others specify
25. The term of employment that you are engaged in the vegetable production?
1. Full time 2. Part time

#### **V. UA and Gender**

25. Whose responsibility is vegetable production?
1. Male 2. Female
26. In what particular part are females involving in the farm activity?
1. Harvesting 2. Weeding 3. Planting 4. All the above choice 5. other specify
27. Do females perform digging?
1. Yes 2. No
28. Do you think vegetable production is gender biased?
1. Yes 2. No
29. If yes to Q. 28 above, who are involving more on UA activity?
1. Male 2. Female
30. If female are more responsible in Q. 28 above, are they allowed benefiting from their effort?
1. Yes 2. No

#### **VI. UA and Its challenges**

31. Do you face challenges in vegetable production?
1. Yes 2.No
32. If yes to Q.31 above, do you have land ownership problem?
1. Yes 2.No
33. Have you got conformation license for ownership of land?
1. Yes 2.No
34. Do you have sufficient cultivable land?
1. Yes 2.No
35. If yes to Q. 34 above, what is the farm size you have-----?
36. Do you have labour constraint?
1. Yes 2. No
37. Do you have market problem?
1. Yes 2. No
38. If yes to Q. 37 above, what type of market problem you have?
1. Lower price of vegetable product  
2. Lack of habit of vegetable consumption by the people

- 3. Lack of market place
- 4. Price manipulation by middle men.
- 39. Do you have lack of water for irrigation?
  - 1. Yes 2. No
- 40. Do you feel threat as a result of urbanization and industrialization in your vicinity?
  - 1. Yes 2. No
- 41. If Yes to Q 40 above, what type of threat you faced?
  - 1. Eviction from my parcel
  - 2. Shrinking of my parcel
  - 3. Both
  - 4. other specify
- 42. Do you have shortage of inputs like fertilizer, hoe, pesticide and improved seed?
  - 1. Yes 2. No
- 43. Do you have extension service support?
  - 1. Yes 2. No
- 44. If yes to Q. 43 above, do you think it is sufficient?
  - 1. Yes 2. No
- 45. Do you have credit service?
  - 1. Yes 2. No
- 46. If yes to Q. 45 above, for what purpose you obtained it?
  - 1. To purchase inputs (fertilizer, pesticides and improved seed
  - 2. Rent land
  - 3. Other specify
- 47. Which type of the input constraints have you faced
  - 1. Hoe 2. Fertilizer 3. Improved seed 4. All the above problems

**Dairy farmer questionnaires**

- 1. Household head name -----
- 2. Sex of the household 1. Male 2. female
- 3. Age
- 4. Number of family size-----
- 5. Education level of HH
- 6. Ethnicity

Number of children	Sex	Age	Education status

- 7. When did your family started to engage in dairy farming -----
- 8. When did you join the cooperative.....
- 9. How many dairy cows do you have.....
- 10. What is your ultimate objective of engaging in dairy farm
  - 1. income generation 2. employment 3. for both consumption and income

11. How much do your family earn from dairy farm per month.....
12. Do your family produce multiple products from dairy farm?  
1. Yes 2. No
13. Do your family experienced change in their life condition as a result of their engagement?  
1. Yes 2. No
14. If yes to Q. 13 above, have you experienced improvement in your food security status?  
1. yes 2. No
15. Do you hire labour?  
1. Yes 2. No
16. If yes to Q. 15, how many labour do you hire?  
1. One 2. Two 3. Greater or equal to three 4. None
17. Do you use modern milk processing machines?  
1. Yes 2. No
18. Is the household head employed formally?  
1. Yes 2. No
19. If no to Q. 18, does dairy farm created employment opportunity?  
1. Yes 2. No
20. How much milk do you produced daily?.....
21. Have you ever challenge upon your engagement in dairy farm?  
1. Yes 2. No
22. What type(s) of challenges you have faced?  
1. Lack of space 2. Lack of capital 3. Animal death  
4. Fodder shortage 5. labour shortage
23. Do you get extension service?  
1. Yes 2. No
24. Do you get credit services ?  
1. yes 2. no
25. Do you have ranging land problem?  
1. Yes 2. No
26. Do you have labour shortage?  
1. Yes 2. No
27. Do you have market problem?  
1. Yes 2. No
28. If yes to Q. 27 which are(is) your problem?  
1. Lack of market place  
2. Low price of milk during fasting seasons
29. Do you have input constraint in livestock production?  
1. Yes 2. No
30. If yes to Q. 29, which are(is) your input constraints?  
1. High price of veterinary drugs 3. Sufficiency of Space for animals  
2. Availability of Modern milk processing machines 4. High price of fodder supply  
5. Availability of Extension service 6. Lack of Hired labour

## Checklists for FGD and KII

### **I. Key informant discussion with urban agriculture Milk producers stakeholders**

1. For what purpose the sub city milk unit was established?
2. In what way your offices control the city milk producers?
3. Do you think that milk producing households are benefiting? If so, in what way?
4. What are the major challenges that your office are facing with regard to milk producers? In what ways your offices overcome these challenges?
5. How can your office are doing to link the producers and extension workers, with new technologies such as new breeding cows and so on?

### **II. Key informant discussion with urban agriculture vegetable production stakeholders**

1. For what purpose the sub city vegetable unit was established?
2. In what way your offices control the city vegetable producers?
3. Do you think that vegetable producing households are benefiting? If so, in what way?
4. What are the challenges that your office are facing while undertaking your task? And what are the pivotal roles that your office are playing to solve problem that vegetable producers are facing?
5. Do you office play some role in fostering and linking producers with new technology, in giving market place etc?
6. What is the implication to the producer where there is a lack of clear policy and master plan that indicate green area in light of securing their land ownership and in fostering sustainable development?

### **III. Focus group discussion with stakeholders in vegetable production**

1. What are the benefits that members of the cooperatives are benefiting from their activity? And what indirect benefit vegetable production has to the environment?
2. What challenges you have observed in pursuit of your respective work in vegetable production?

3. What is the main threat that you are facing in light of the booming construction sector around your vicinity? Do you think vegetable production is a viable option in long run?

#### **IV. Focus group discussion with stakeholders in Milk production**

1. What are the benefits that members of the cooperatives are benefiting from their activity?
2. What challenges you have observed in pursuit of your respective work in vegetable production? For instance with environmental pollution, health issue and so on?
3. What are the challenges that you are facing in getting ranging land and how your issues are welcomed in the sub-city with regard to land?

3. What is the main threat that you are facing in light of the booming construction sector around your vicinity? Do you think vegetable production is a viable option in long run?


#### **IV. Focus group discussion with stakeholders in Milk production**

1. What are the benefits that members of the cooperatives are benefiting from their activity?
2. What challenges you have observed in pursuit of your respective work in vegetable production? For instance with environmental pollution, health issue and so on?
3. What are the challenges that you are facing in getting ranging land and how your issues are welcomed in the sub-city with regard to land?

## Declaration

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

Declared by:

Teferi Assefay  


Candidate

Confirmed by:

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\_\_\_\_\_

Advisor