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THE CONTRIBUTIIONS OF URBAN AGRICULTURE IN ALLEVIATING FOOD INSECURITY OF POOR URBAN HOUSEHOLDS: EVIDENCE FROM SELECTED KEBLES OF AKAKI-KALITI SUB-CITY, ADDIS ABABA

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The Contribution of Urban Agriculture in alleviating food insecurity of poor urban households: Evidence from selected kebeles of Akaki Kality Sub-City, Addis Ababa.

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PUBLIC ADMINISTRAITON AND DEVELOPMENT MANAGEMENT

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Acronyms

CSA :	Central Statistic Authority
PHCE :	Population and Housing Census of Ethiopia
MSME:	Micro, Small & Medium Enterprise
UPA :	Urban & Peri-Urban Agriculture
NGO :	None Governmental Organization
UNDP:	United Nations Development Program
RUAF:	Resources Center on Urban Agriculture & Food Security
FAO :	Food and Agriculture Organization
USAID:	United States Agency for International Development.
MRA :	Minimum Recommended Allowance
MoFED:	Ministry of Finance and Economic Development
WB :	World Bank
IFRI :	International Forestry Resources and Institutions
FSCB :	Food Security Coordination Bureau

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DEDICATION

I dedicate this thesis manuscript to my beloved parents for nursing me with affection and love and for their dedicated partnership in the success of my life.

Sophia Berhe Adera

March 2, 2015

Addis Ababa, Ethiopia

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DECLARATON OF THE AUTHOR

I declare that this Thesis is my work and that all sources of materials used for this Thesis have been duly acknowledged. This Thesis has been submitted in partial fulfillment of the requirements for the Master of Arts Degree Program in Public Management and Policy at Addis Ababa University. I solemnly declare that this Thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

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Date of Submission: March 2, 2015

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Sophia Berhe Adera
March 2, 2015
Addis Ababa, Ethiopia

ABSTRACT

Urban agriculture has food security, economic, social and environmental impacts. The focus of this study was on food security of poor urban households. The purpose of this comparative study was to investigate the contributions of urban agriculture in alleviating urban household food insecurity in Akaki-Kaliti Sub-city. The study's target population is composed of both urban poor households engaging in urban agriculture and those who are not engaging in urban agriculture. The study sought to investigate the relationship amongst the different dimensions of food security and the households' status in relation to engagement in urban agriculture along with their average daily income. Both quantitative and qualitative methodologies were employed in the study whereby structured questionnaires were prepared for the survey of randomly selected 100 urban poor households with similar socio-economic status. Discussions were also made with the purposively selected key informants and urban agriculture stakeholders in Akaki-Kaliti sub-City. Data analyses were made by using 'IBM SPSS Statistics 20'. Data results were interpreted. The result of the study revealed that one in two of the households sampled from both low incomes unemployed owners engage in at least one form of farming. The result also indicated that households who engage in farming have earned food and cash income; this has contributed both in improving household food security by improving food availability (50%) and nutrition, measured by proxy, of variety of food intake at household level (50%). The study concludes with the policy advice that government support to poor households should include interventions that can improve the variety and productivity of farms at household levels. The stakeholders that involve in urban agriculture and waste management should integrate their support towards improving the productivity of urban agriculture at household and community levels. These together are assumed to improve both the productivity and variety of farming as well as greener ways, in ways that proactively and efficiently manage urban waste.

Chapter One: Introduction

1.1. Background of the Research Problem

Long time has elapsed after the projection that sixty-six percent of the world's urban population live in developing countries; this proportion is expected to increase to 80 percent by the year 2030 (ETC-Urban Agriculture Programme 2003). Recent literatures indicate that Africa is rapidly urbanizing. Africa's urban population is projected to increase from 39% in 2005 to 53% in 2030 (Arku et.al 2012). This rate shows high increase in urban population. When compared to developed regions, both the rate and the real population growth are high in developing countries; whereas urban food supply, utilities and amenities are increasingly insufficient.

Because of the increase in population, most cities in developing countries are facing great difficulties in coping with this development and are not capable enough to provide sufficient food demanded by the expanding urban population. Among the general urban dwellers, the urban poor are the most poverty stricken. For poor families, meeting their most basic needs of food, water and shelter has become a daily struggle. This becomes acute when there is unemployment, lack of productive land and other income-earning activities (as well as assets that can be transformed to entitlements). The works of Sen (1987) and Chambers (2010) substantiate this relationship – Sen (1987) associated food security as component of the function of changes endowment (assets transformed to cash and enhance entitlements of households and individuals). Chambers (2010) argued on the relationship between household poverty and transformative nature of household assets (possibility of changing them to cash and efficiently spend on the preferences at household levels.

In both cases (Sen and Chamber) the mismatch between urban population growth and food supply have resulted in the prevalence urban food poverty, particularly in increased levels of food insecurity in urban areas. A study by Ellis and Friedman (2005) indicated that urban food insecurity is an indication of urban poverty. In this connection, ensuring food security and appropriate nutrition of the urban population, in particular of the poorest households has become a tremendous challenge in many cities in developing countries. Ravallion (2007)

estimates that about one-quarter of the developing world's poor live in urban areas, but also that poverty is becoming more urban and is reflected in urban food poverty; poverty as understood as insufficient food availability, access and utilization; which due to various factors is unstable and make households insecure.

Currently, urban agriculture is one of the livelihood strategies of the urban dwellers; particularly the urban poor. It is common in many developing countries but recently is an increasing phenomenon in sub-Saharan Africa. As technologies of food production improved, in terms of plant nutrient supply and improvements in productivity in unit area, urban agriculture has become intensified and commercialized form of farming (see Bryceson 2005). But in poor countries like Ethiopia, urban agriculture is associated with households' choice of coping urban poverty. Growing urban poverty, specifically the increasing demand for food as well as lack of formal employment opportunities has introduced urban agriculture as a livelihood strategy. In other words, it evolved as a response to scarcity of urban economic sustenance, i.e. insufficient urban food supply coupled with declining purchasing power of the urban poor and diminishing smallholder farm productivity in developing countries.

The trend of urbanization (in rate and real population growth) seems similar also in Ethiopia. According to the 1994 Population and Housing Census of Ethiopia (CSA 1994), urban population was not that much huge. However, the figure on the population size of Addis Ababa has grown tremendously. In 1961, the population of Addis Ababa was 443,728; just after six years, in 1967, the population grew to 683,530.After ten years, in 1978, the population of Addis Ababa skyrocketed to 1,167, 315.The population of Addis Ababa has changed from 1,423,111 and 2,112,737 in 1984 and in 1994 respectively. Compared to the 1984 census, the 1994 population size of Addis Ababa has shown a 3.26% increase (PHCE 1994). The growth rate has shown continuous change over time, after 1994, including changes in real population numbers. Population at national and household levels has direct relation with food supply; differing in intake and nutrition, which is further related to

income. Thus population growth significantly impact household food demand (measured in food availability, access, adequacy, utilization and stability) both in quantity and quality.

It is within this context that urban agriculture stands to play a strategic role in enhancing urban food security. Urban farming activities are specifically relevant to households at peripheral sub cities of Addis Ababa. The peripheral sub cities have relatively large plots for farming at one hand and the poor households often squatter at peripheries of Addis Ababa.

The informal production of food in city areas, a phenomenon known as urban agriculture, has been a widespread strategy adopted by urban dwellers in many sub-Saharan African cities to cope with increasing levels of urban poverty (Dereje; et al, 2007). This phenomenon is also evident in Ethiopia. Urban agriculture is a traditional practice in Ethiopia. The Central Statistical Authority for Ethiopia (CSA) states that the average number of households engaged in urban farming in Addis Ababa was about 7,619; thus over 38,095 family members are assumed directly support by income from farms. The figure above is also indicative of the changes in time periods from 1995 – 2000.

The contribution of urban agriculture has got policy recognition; especially with the government policy direction of initiating and supporting Micro, Small and Medium Enterprises in urban areas (see Federal MSMEs Policy 1997). Thus urban agriculture has become a relevant component of the urban development policy (MoWUHC 20…). The integration of urban agriculture into the urban land use system and the creation of a favorable policy environment are critical steps in the development of the sector. In a context of widespread urban unemployment and poor living conditions, the formal support of urban agriculture activities is believed to play an important role in alleviating urban poverty. This study has looked at Addis Ababa, particularly Akaki-Kaliti Sub-City, where urban agriculture provides income, employment and food security for disadvantaged populations. The study considered household income and expenditure, in terms of food availability, access and utilization, its stability over the 12 months of the year; including criteria for sampling, data collection (data and analytic units). In general, the income and expenditure

criteria were employed in identifying the poor, deciding sampling procedures and sample size in the study area. Both the units of data collection and analysis were decided on the basis of these criteria above. The present study presents its evidence, analysis and lessons on the basis of the policy objectives identified as follows. In order to attain the goals of the policy, the document has presented specific objectives and the subsequent strategies. Accordingly, the following six policy objectives were crafted for the city:

1. Ensure suitable land is made available and used for urban agriculture;
2. Ensure safe and sustainable water is made available and utilized for urban agriculture;
3. Ensure relevant, efficient and pluralistic delivery of urban agriculture support services to enhance the productivity and economic viability of urban agriculture;
4. Ensure health and environmental risks free urban agriculture;
5. Enhancing legal framework and awareness on urban and peri-urban agriculture; and
6. Ensure the inclusion of gender and social dimension of urban agriculture in the urban and peri-urban agriculture programs (Addis Ababa City Administration 2013).

The problem analysis below is presented on the basis of policy and actual context analysis of urban agriculture in sub-Sahara African countries in general and Ethiopia – Addis Ababa contexts in particular.

1.2. Problem Analysis

After the recognition of urban agriculture, as component of MSMEs development policy, the Trade and Industry Development Bureau of the Addis Ababa City Administration has enacted the 'Urban and Peri-Urban Agriculture Policy and Implementation Strategy Document' in February, 2012. Accordingly, the City Government has recognized urban agriculture as one of the important tools to end the widespread problem of urban food insecurity. The recognition of urban agriculture also emanates from the policy priority of the government; mobilizing labour towards flourishing of MSMEs. The strategy assumes also the potential of urban agriculture to be transformed to technology-driven, commercialized and intensified farming; with broader impact on urban poverty reduction. This has been clearly reflected in the endorsement of the aforementioned policy document and acceptance

of urban agriculture as an integral component of the City's Master Plan. This is a critical step in the creation of a favorable policy environment for a sustainable development of the commercial and technology-intensive urban agriculture sub sector in the city.

The Addis Ababa Urban and Peri-Urban Agriculture Policy and Strategy document provides a sound policy and implementation framework that promotes Urban and Peri-Urban Agriculture in an effort to improve food security, income and employment of the urban community in an environmentally friendly, socially inclusive and gender sensitive manner in the short and medium terms; while commercial and technology-intensive urban agriculture in the long-run. The main purpose of this policy and strategy document is to mobilize the Addis Ababa City Administration and residents, who plan to participate in agricultural SMEs, to appreciate urban and peri urban agriculture. The policy adopts a self-reliance strategy towards growth and transformation plan and to play partly to the vision of Ethiopia to become a middle level income group country by 2020 (Addis Ababa City Administration 2013).

In general, the policy is expected to:- a) assist the Addis Ababa City Administration in promoting and supporting the development of a well-organized, viable and sustainable urban agriculture; b) provide guidelines in the implementation of urban agriculture programs and projects throughout the City addressing the major policy issues; c) assist the local authority in the integration of Urban Agriculture in its socioeconomic system as a legitimate land use and economic activity and its institutionalization; and d) address key issues, challenges and proposals for their resolution (Addis Ababa City Administration 2013). The achievements of these expectations are assumed to accomplish the goals presented in the previous paragraphs.

The principal concern of this policy is to promote urban farming as a strategy for greener city, social inclusion, enhance food security, poverty reduction and local economic development for the poor. Particularly, the policy envisaged to contribute towards eradicating food poverty and improve the nutritional status of the community, specially the resource poor in the urban community. Therefore, the research problems identified from the

above analysis are: (1) the implementation of the urban and peri-urban agriculture policy and strategy is not scientifically assessed and knowledge and evidence on the outcomes of policy support is scant; (2) the contributions of urban agriculture practiced by poor households on the stability of food income and expenditure (in terms of availability, access and utilization) over twelve months of the year, of the urban poor is not scientifically analyzed, and knowledge and empirical evidence is scant; (3) the types of farming practiced by poor households, the groups of households practicing, the stakeholders and their support to urban agriculture and the extent to which the income from these practices fill the food gap of the urban poor is not researched against the policy goals and household preferences.

On the other hand, there are also practical problems in the implementation of the policy. The policy document maintains that urban agriculture operates under special urban conditions that tend to be challenging, coupled with urban producers limited access to support services (training, business development, advisory, research, credit & finance and input) (Addis Ababa City Administration 2013). These factors were analyzed with in the category of policy support (from public organizations and other stakeholders).

1.3. Research Questions and Objectives

The purpose of this study is to assess the critical role of urban agriculture in alleviating urban household food insecurity in Addis Ababa with particular reference to poor households in the Akaki-Kaliti sub-City and the critical look on the implementation of the urban and peri-urban agricultural policies and strategies. The study focused the household head is operationalized as the main source of food income of the household; among those practicing urban agriculture. The study focused on households with inadequate income and with unemployed household member that generates adequate food income. In line with this, the specific research questions identified are;

- What types of farming are practiced in the selected Kebeles of Akaki-Kaliti sub-City?
- Which groups of households are engaging in which type of urban farming activity in the selected Kebeles of Akaki-Kaliti sub-City?
- Who are the stakeholders in urban agriculture support in the selected Kebeles of Akaki-Kaliti sub-City?
- What are the supports provided by the stakeholders that promote farming in the selected Kebeles of Akaki-Kaliti sub-City?
- To what extent is urban farming filling the food gap of the households employed in urban farming in the selected Kebeles of Akaki-Kaliti sub-City?

The study was aimed at assessing the contribution of urban agriculture in alleviating urban household food insecurity in selected Kebeles of the Akaki-Kaliti sub-City. The objective was chosen in the understanding that the food insecurity status was seen at micro institutional level (household) and at micro social group level (group of poor households). In line with this, the specific objectives identified were to:

1) Assess the types of farming that are practiced in the selected Kebeles of Akaki-Kaliti sub-City by households among poor income groups;
2) Identify the stakeholders in urban agriculture support to poor households that are engaged in farming in the selected Kebeles in selected Kebeles of Akaki-Kaliti sub-City;
3) Assess how the policy supports provided contributed to farming activities of poor households in selected Kebeles of Akaki-Kaliti Sub City;
4) Analyze the extent to which the food gap of the poor households are filled by the food income from the urban farming practices by poor households in selected Kebeles of Akaki-Kaliti sub-City.

1.4. Significance of the Study

This study has portrayed the relationship between the engagement of the urban poor households in urban farming and the improvements in food insecurity of poor households in the selected kebeles of the Akaki-Kaliti sub city. It provided relevant policy information on the role of urban farming in alleviating food insecurity. In this respect, the study result has policy and empirical relevance. The policy relevance, therefore, is that the issue of identifying the actual role of urban agriculture in tackling the problem of urban food insecurity in Addis Ababa is still demanding and calls for extensive empirical research and policy information. Empirical works such as this is also important for understanding the livelihoods of the urban poor. In line with the policy recognition, help urban policy practitioners may benefit from the results of this study to implement the Addis Ababa Urban and Peri-Urban Agriculture Policy and Strategy. It will also show role that urban agriculture plays in urban food security with empirical evidence. Based on the problem analysis above, the study is aimed at assessing the role of urban agriculture in improving urban household food security for the poor (households with inadequate income and the unemployed) in Addis Ababa City Administration.

The empirical relevance relates to the substantiveness of the evidence and the lessons (conclusions) discerned from the results of the analysis. In this respect, the study applied a comparative research design. It comparatively analyzed data collected from poor urban households engaged in urban farming and poor urban households that don't practice farming. The findings may thus enhance knowledge on the contribution of urban farming at one hand and contributions to improving the existing urban agriculture policy provisions of the Addis Ababa City Administration. This study design was appropriate to examine the contributions of urban farming in improving urban food insecurity and the workability of the urban farming policy supports provided by the City Administration of Addis Ababa.

On the basis of the relevance presented, the result may benefit urban planners, programmers, project development and allocation of funds by the City Administration of Addis Ababa.

Finally, future researchers in the thematic area may benefit from the methodology and the results.

1.5. Scope of the Study

This study has focused only on urban farming rather than the broad sector of agriculture. It was delimited to assessing the contribution of urban small farms towards improving urban food insecurity of poor and unemployed households; on the basis of evidence collected from Akaki-Kaliti sub-City. This specific site was selected as a study area given that the performance of urban farming is relatively higher in this particular sub-City and it is a niche to rural Woredas of Oromia region. Evidence shows that out of the ten sub-Cities, Akaki-kaliti ranked first in performance in five out of ten urban agriculture areas (See 'Table 16' in the appendices). In addition to this, because of its topography, urban liquid waste flow to this sub city, making it favorable at the course of the waste water (though issue of growing crops using waste water is debatable on the basis of quality and health).

The research has analyzed the extent of the food gap of poor households that is filled by the urban farm incomes of households in the selected Kebeles of Akaki-Kaliti sub-City. The poorer households were identified based on income and expenditure method. Accordingly, the study was carried out at the household level and has addressed household producers. Only the stakeholders that give support at household level were considered and selected. The study does not provide a detailed examination on the execution of urban agricultural programs in general. Therefore, its thematic, methodological and geographical scope has focused and selected on the basis of the manifestation of huge farm practices and the study population focused on poor households with inadequate income and employment to secure food over the 12 months of the previous year.

1.6. Ethical Considerations

Although there are no identifiable risks of participating in this study, all of the participants were treated in accordance with the ethical guidelines of a social science research. Participants of the study have been freely consented; personal identities have been kept

confidential and protected; moral standards have been applied to decisions made in planning, conducting and reporting of the results. There was no deliberate misrepresentation of the purpose of the study and overstatement or understatement of the findings.

As well, the research has been conducted following all the necessary steps to make it methodologically thorough as much as possible; all kinds of results and findings whether good or bad were reported; the researcher has remained impartial throughout the study to avoid interjections of personal feelings or bias; and finally submitting unreliable data, distorting opposing views and most importantly plagiarism have been avoided.

1.7. Organization of the Paper

The first chapter has dealt with an introduction which including the background, statement of the problem, research questions, objectives, significance, scope, ethical considerations, and organization of the paper.

The second chapter has dealt with a review of theoretical and related literatures including the origin of urban agriculture, definitions and features, stakeholders of urban agriculture, benefits and limitations of urban agriculture, relationship between urban agriculture & urban food security, and the analytical framework of the study.

The third chapter has dealt with the methodology of the study and has presented the research method, research design, sample design variables of the study, method of data collection, and methods of data analysis.

The fourth chapter dealt with data analysis and discussions up on the findings of the study.
The fifth chapter dealt with the concluding remarks and recommendations of the study.

Chapter Two: Review of Related Literatures

2.1. Introduction

At one hand food and agriculture industries are becoming unsustainable. On the other hand, urban slums are rapidly expanding depicting the concentration of the poor in urban slum locations. Food security is crucial for poor households residing in slums. It is becoming crucial that city governments work to ensure food security for the inhabitants of the ever-increasing urban households (Gittleman 2009) at one hand and focus on poor households living in slum areas on the other hand. Commercialization of subsistence agriculture has also played a role here (see Bryceson 2005). Urban agriculture comes as a response to the food insecurity that arises from this complex problem, and provides a means for poor communities to achieve food security or contribute towards access to adequate nutrition and livelihood (Gittleman 2009).

Poor urban dwellers, being largely net food buyers and depending mostly on markets for their food supplies, are particularly vulnerable to adverse food price shocks, and are consistently the group in society that suffers most from higher food prices (Dessus et. al 2008). In this context, urban agriculture may have an important role to play in addressing food insecurity problems in urban areas. Analyzing the extent to which urban agriculture might help shield the urban poor from some of these shocks becomes therefore a topical policy question.

Urban agriculture is generally viewed as a potentially viable policy response to the complex challenge of feeding a burgeoning mass of urban residents amidst decline in food production in rural areas and increasing price of food. This problem intertwines with the challenge of declining purchasing power of the poor. Also, recent concern regarding climate change and the need to reduce the environmental footprint that comes from transporting food over long distances has given impetus to the need for urban agriculture (Arku et. al. 2012). Besides this, the lack of infrastructure and poor transportation links between surplus food producing

areas and consumers has been persistent challenge in developing countries; especially Sub Saharan Africa (see Bryceson 2005).

Urban agriculture contributes significantly to the socioeconomic development of towns and cities throughout the world. In several economies, particularly developing ones, it is one of the largest productive urban industries. In low-income cities, it is a prime generator of jobs. But its marginal returns (in income and productivity) has been declining rather than increasing)

Urban agriculture includes many diverse production systems, each with multiple production and processing and marketing methods and procedures. These systems are often interlinked to each other, with the waste from one typically feeding another at one hand and the value claims on the other.

Now, as the potential benefits of urban agriculture for food security, environmental management, and economic development become better understood in policy circles, official attitudes in some countries are slowly but steadily changing (Arku et. al. 2012). According to Gündel (2006), over the last decade there has been a growing recognition of the significance of urban and peri-urban agriculture (UPA) for poor people's livelihoods. Urban Agriculture (UA) has become a contemporary issue, gaining prominence especially in developing economies. It has been asserted that urban agriculture should be given a primary role in poverty intervention strategy for the urban poor.

2.2. The Origin of Urban Agriculture

Urban agriculture is a recent phenomenon in only a few places. There are long traditions of farming intensively within and at the edge of cities. Each tradition is deeply rooted in local concepts of city and community, and in local societal and cultural practices (Smit et. al. 2001). Particularly, Arku et. al. (2012) maintain that the history of urban agriculture in Africa dates to the colonial era where farming flourished in urban areas, largely to meet consumption needs of bureaucrats, settlers, and other elites.

According to Smit et. al. (2001), the present mix of farming systems in cities was shaped primarily by eight factors. These include:

1. Continuity of historical practices: - there are numerous instances of urban agricultural practices with roots that date back decades or centuries but have evolved to accommodate contemporary conditions — allotment gardens in Europe that were invented in the second half of the 19th century, vegetable patches in African colonial cities with their roots in ancient communal practices, the centuries-old Chinese system of reusing the night soil of cities to fertilize nearby farms, or Mexico City's *Chinampas,* which represent a specific farming system pre-dating the arrival of Columbus.

2. Nature of plant and animal domestication and its relationship to people: - urban agriculture has evolved a mix of plants and animals that are somewhat distinct from rural agriculture for several reasons — livestock, fish, and horticultural crops need to be tough to survive a relatively hostile urban environment, the high value of land necessitates growing higher-value products, and the urban market demands diverse products that urban farmers often focus on.

3. Conception and management of natural and man-made environments: - some societies have evolved technology and management systems that include agriculture as an urban activity, but others have separated the settled and the sown. This difference in approach typically reflects varying attitudes to the way natural and man-made environments relate to each other, and characteristically have cultural roots.

4. Industrial agriculture revolution: - in many parts of the world, beginning in the late 19th century, machines replaced manual labor in many forms of agriculture, and units of production, processing, and marketing became larger. Urban agriculture has responded to this rural-dominated trend by concentrating on niche markets, barter trade and currency trade, reuse of waste, and household and community organization to foster food security.

5. Global information revolution: - the information revolution is spreading the know-how of urban food production across national and cultural borders. It is also enabling new forms of marketing particularly suited to cities because of their greater connectivity.

6. Rapid post-World War II urbanization: - urbanization has advanced more rapidly than population, economies, or farm-to-market and other infrastructure in the majority of countries. Therefore, the burden of feeding cities has increasingly fallen on city folk themselves. On every continent, the relative shortage of land has generated more intensive means of production and a lengthening of growing seasons, from rabbit hutches on the veranda to greenhouses at the electrical power plant.

7. Settlement patterns resulting from contemporary urbanization: - the nature of human settlements — especially urban settlements — has been transmuted in the past half century in particular. The emergence of the megalopolis for the first time is perhaps most remarkable, but little noted is the amount of uncultivated land that lies in the interstices and along the edges of the megalopolis. More generally, recent urban development has been — despite impressions to the contrary — increasingly low in density, affording ever greater opportunities for urban agriculture within urban settlements.

8. Great expansion of low-income segments of the urban population: - poverty has become an increasingly urban phenomenon at the end of the 20th century. The first concern of the urban poor is food security, and through their resourcefulness, they have reinvented agriculture to fit the new post-industrial city.

The aforementioned authors assert that the first three factors give historical roots to urban agriculture, and help to explain both continuities in some instances, and changed practices in others. The last five factors are mainly contemporary developments — rapid urbanization has meant that the number of urban residents, particularly the urban poor who had to find ways to sustain themselves, has greatly expanded the scale of urban agriculture. This has been accompanied by new ways to produce for growing populations, thus the legacy of ancient and recent historical developments can be seen in the way urban agriculture is practiced today.

Food insecurity has always haunted cities and towns. At times it would be well-controlled, at other times it would strike more or less significant portions of the population. Food security was managed, partly through uncoordinated individual actions, and partly through planned public and private interventions. It is difficult to know whether what we call urban agriculture was developed by the first urban settlers in a systematic way to feed their cities, or involved incremental modification of food production as urban concentrations took form. Both are likely (Smit et. al. 2001). At all times, urban agriculture has played some role in ensuring a food supply for urban residents. In all parts of the world, ancient civilizations developed urban agriculture systems, devising many innovative ways to produce food and manage land, water, and other resources efficiently (Smit et. al. 2001).

During the 1980s and 1990s, the importance of urban agriculture accelerated dramatically throughout the world (Smit et. al. 2001). Specifically, with the growth of urban populations in most developing countries during the last half of the 20th century, urban food production and distribution systems became less and less reliable. Urban hunger grew in parallel with the urban population, accelerated by political and economic instability in too many places. In response, urban agriculture became increasingly common in an ever-growing number of countries (Smit et. al. 2001).

Urban agriculture throughout the world is transforming itself in response to political, economic, environmental, and technological changes (Smit et. al. 2001). Today, urban agriculture is becoming increasingly significant as a source of household food, a trend that is closely linked to declining incomes of vulnerable urban households in the wake of neoliberal economic restructuring, high rates of urbanization, and the need to serve an emerging niche market in African cities (Arku; et. al, 2012).

2.3. Urban Agriculture: Definitions and Features

The term ‘Urban Agriculture’ is coined from the words ‘urban’ and ‘agriculture’. Thus, it is important to clarify how the words ‘urban’ and ‘agriculture’ are used in this study and to define what is included in the realm of urban agriculture and what falls outside its scope.

Urban is used in a broad sense, to encompass the entire area in which a city‘s sphere of influence (social, ecological, and economic) comes to bear daily and directly on its population (Smit et. al. 2001). As for agriculture, it too is used in its broadest sense, embracing horticulture, aquaculture, arboriculture, and poultry and animal husbandry. The term agriculture also incorporates pre-production and post-production processes, as well as waste recycling processes. Agriculture, farming, cultivation, and raising crops and animals are used interchangeably. Farmer refers not just to the rural resident whose main occupation is crop cultivation and livestock rearing, but also to the part-time or recreational one (Smit et. al. 2001).

A consensus about the exact definition of urban agriculture does not exist. Despite, urban agriculture can be defined, more narrowly, as simply an agriculture that happens to fall within or at the edge of a metropolitan area, perhaps adding its relationship to urban populations. Also, Smit et. al. (2001) state that urban agriculture can be defined as an industry that produces processes, and markets food, fuel, and other outputs, largely in response to the daily demand of consumers within a town, city, or metropolis, on many types of privately and publicly held land and water bodies found throughout intra-urban and peri-urban areas. Typically urban agriculture applies intensive production methods, frequently using and reusing natural resources and urban wastes, to yield a diverse array of land, water, and air based fauna and flora, contributing to the food security, health, and environment of the individual, household, and community.

However, a richer definition would emphasize those elements that have come to characterize urban agriculture as it is practiced today, while recognizing the great variety within it. Though there are a number of definitions on urban agriculture, five elements are more commonly found in these definitions. These include: a) the location in which urban agriculture occurs; b) the types of activities included under urban agriculture; 3) the legality and type of land tenure under which the urban agricultural activities occur; 4) the stages of production included in urban agriculture; and 5) the scale of urban agricultural activities. To this list, two other crucial elements that are especially important for lower income groups; namely the purposes of the activity and the types of groups involved in agricultural production in urban areas can be added (Quon 1999).

Generally, urban agriculture is an entrepreneurial activity for people at different levels of income. For the poorest of the poor, it provides good access to food. For the stable poor, it provides a source of income and good quality food at low cost. For middle-income families, it offers the possibility of savings and a return on their investment in urban property. For small and large entrepreneurs, it is a profitable business.

Urban agriculture is a large industry that includes many small-scale farmers and some large agribusinesses. Urban agriculture takes place on smaller tracts of land than rural fields and on open spaces that are vacant, idle, or unsuited for urban development. Although the most common site is the household plot, urban agriculture can be found throughout the metropolitan area.

Some typical examples of urban agriculture include: fish and other aquatic products, community and allotment gardens and horticulture.

2.4. Stakeholders in Urban Agriculture

A great number of organizations influence urban farming. They can be categorized into six groups: (i) farmers, (ii) non-governmental organizations (NGOs) and other support entities; (iii) local and national governments and other public authorities; (iv) institutions, including

independent and university research centers; (v) private firms; and (vi) international development agencies (Smit et. al. 2001).

These actors can be classified according to the five roles they fulfill: production, regulating, facilitating, providing, and partnering. One organization can fulfill multiple roles simultaneously or through different components. Moreover, actors not only influence urban agricultural activities, but are also affected by them, either unfavorably (as when poor agriculture practices cause health problems that require government intervention) or favorably (as when farmers properly use the sludge from a wastewater treatment plant) (Smit et. al. 2001).

Regulating: urban agriculture is regulated through a variety of laws, rules, regulations, and programs. Impacts of the regulatory framework range from a generally favorable or unfavorable climate resulting from policies that grant or deny a stamp of approval to agriculture, to concrete actions of evicting farmers, cutting down crops, or confiscating livestock. Legislation affecting urban agriculture includes land use, building, environment, and health codes, and enforcement is most often the responsibility of local governments. National governments have important roles in establishing and enforcing health and environment laws and regulations and in setting policy (Smit et. al. 2001).

In addition to government laws and regulations, other less obvious regulating instruments include international codes, on which many national and local codes are based; crop quality or purity standards established by farmers' associations for their members; and informal community controls on farming practices, often based on tribal, cultural, or religious views (Smit et. al. 2001).

Facilitating: as used here, facilitation includes providing technical advice and training; brokering relationships with markets, government, bankers, and other groups; leading or supporting policy or regulatory changes; eliminating constraints; providing information; and assisting with organization (Smit et. al. 2001).

Providing: actors intensify their involvement in urban agriculture when they move from facilitating (which is equivalent to providing services) to providing resources and inputs. This assistance includes supplying seeds and tools, granting access to land and water, or providing a processing facility or insurance. It can also include providing financial resources, such as credit for purchasing inputs or land, funding for research, or seed money to initiate an endeavor. Efficient marketing requires market information, weekly radio programs as well as other private and public media; and information about the latest techniques, neglected crops, and the shifting pattern of the urban market (Smit et. al. 2001).

Partnering: in most countries, governments and institutions are large holders of certain urban resources, especially land. They thus have a bigger stake in urban agriculture than most other actors, which gives them a special role in the provision of these resources. When they act as a landlord or an active participant in, for example, sewage-based pisciculture (Pisciculture is the breeding, hatching, and rearing of fish under controlled conditions; Source: the Concise Oxford English Dictionary), their role moves from that of an important outside actor (regulator, facilitator, and provider) to that of a directly-involved party. This more intimate involvement is referred to as partnering. It occurs when there is a strong collaborative relationship — a university allows farmers to cultivate part of its vast land holdings in return for a share of the crop, a highway authority allows farmers to graze the verges in return for maintenance, or a river port authority deposits dredge material on farmers' fields in agreement with a farmers' association (Smit et. al. 2001).

2.5. The Benefits and Challenges of Urban Agriculture

Since urban agriculture is practiced mainly within boundaries of cities, it has unique features with distinct potentials and constraints. Long-term benefits of cities from urban agriculture imply the contributions of the sector to sustainability of cities (Nugent, 1999). Nugent reported that studying urban agriculture from three dimensions, social, economic and ecological, is helpful to realize the net benefit; hence, its sustainable contribution to the selected city.

2.5.1. Benefits of Urban Agriculture

Urban agriculture benefits the economy, environment, and well-being of those active in the industry, as well as residents who enjoy its products. It plays a role in programs and projects that target health and nutrition, the environment, enterprise development, income generation, water and sanitation, youth and women, and food production and supply (Smit et. al. 2001). Urban agriculture is mainly practiced in city open spaces, along riversides and urban fringes where land is not suitable for building construction. As Bryld (2003:81) puts it "urban agriculture brings with it great potentials for enhancing the situation of the urban citizens, especially those with the lowest incomes who are dependent on the access to locally grown food".

- **Food security**

Acceleration of urbanization in developing countries has been accompanied with increased demand for food consumption. Yet, the number of poor urban households has also significantly being rising along with urbanization, so do many households who cannot afford to buy enough food for their own consumption (Bryceson and Potts 2005).

Most of urban farming is practiced by the urban poor who consume most of the production and supply the surplus to market (Bryld 2003, Mireri et al. 2006). The major expense for most of the urban poor is purchasing of food; thus, they will be left with nothing for health, education and other necessities. They also hardly consume varieties of food. Thus, it is not surprising that urban farming contributes to improving food security for the urban poor. It improves not only quantity of food intake but also the nutritional value if the poor self-grow vegetables, fruits, chickens and so on (Bryld 2003: 81, UNDP 1996). RUAF (2007:2) report emphasized the role of urban agriculture as follows:

- Food security (nutrition): The contribution of urban agriculture to food security and healthy nutrition is probably its most important asset. Food production in the city is in many cases a response of the urban poor to inadequate, unreliable and irregular access to food, and the lack of purchasing power.

- **Economic potential:** Urban farming can also be a good source of income for the urban poor, if it is especially practiced as a formal sector. However, (Bryld 2003) doubted if it has a significant contribution to macro- economies of cities although he stated that urban farming has an economic relevance because it is helping urban farmers, especially the poor, to use their non-farm income for other purposes instead of purchasing food, i.e. it improves the welfare of urban farmer households. RUAF (2007) reported that the poor households in developing countries spend 50-70 % of their income to purchase foods; hence, it appreciated the benefits of self-growing crops and/or participating in other forms of urban agriculture by the urban poor. The report also confirmed "in Addis Ababa, above-normal profits are earned by even the smallest-scale backyard producers with very low capital" (RUAF 2007:5)

- **Social advantage:** Actors in urban agriculture came from various groups of urban society. They can be the poor or the rich, women or men, natives or migrants, and so on. The participation of mostly women and other vulnerable households in the sector draws attention, and implies the role of the sector in poverty alleviation and integrating urban societies (RUAF 2007, UNDP 1996). UNDP put in its 1996:165 reports "urban farming improves social equity by improving the health and productivity of poorer populations and by providing them an opportunity to earn additional income."

- **Environmental advantages**: In most cases, urban agriculture is practiced in marginal spaces in cities and outskirts where lands are not suitable for other use. It, therefore, creates beautiful scenarios and landscapes, and improved microclimate, and nutrient recycling (Bryld 2003, and Deelstra and Girardet 1999).

2.5.2 Challenges of Urban Agriculture

Despite the advantages of urban agriculture mentioned above, it has some limitations worth noticing.

- **Space for cultivation:** Agriculture requires land. However, there is lack of space for growing crops in cities. As Bryld (2003:82) said it, "besides feeding the poor in the cities,

there is an urgent need for providing shelter for the homeless". Knowing that growing food in cities requires land, it may not be prioritized in urban land uses since the demand for urban spaces to build houses is by far higher than using spaces for agricultural activities. Argenti (2000:1) further emphasized that "…agricultural productive lands are likely to be lost in this competition."

- **Health problems:** Urban agriculture can be a health hazard. It uses resources of cities such as water and urban wastes for production. Use of wastewater/polluted rivers and untreated compost may contaminate crops/livestock and become health hazards to human beings. There are a number of cases when urban farming brought health problems (UNDP 1996).

2.6. The Relationship between Urban Agriculture and Urban Food Security

The most influential and widely accepted definition of food security is the one of the Food and Agriculture Organization (FAO) of the United Nations: "access by all people at all times to enough food for an active and healthy life" (Baumgartner and Belevi 2001). This definition encompasses many issues, but above all the following are its key components.

- ***Availability:*** is achieved when sufficient quantities of food are consistently available to all individuals within a country.
- ***Access:*** is ensured when all persons within a household have adequate resources to obtain appropriate foods for a nutritious diet at all times.
- ***Adequacy:*** in terms of quality, quantity, safety, cultural acceptability, and food preferences.
- ***Stability:*** stability of access to food over the year (takes into account shocks and vulnerability).

Urban agriculture has proven its contributions to urban and national food security countless times, most notably in recent years. As more frequent and more damaging disasters confront a population that is moving to the world's cities, urban farming often offered a critical solution.

Urban farming is an integral part of the urban food supply in most lower-income countries. It tends to provide products that rural farming cannot supply as well — perishables that suffer during transport, high-value crops that need close monitoring of the market, and certain export crops that require rapid delivery when ready. It is thus complementary rather than competitive with rural farming, contributes to the national economy, and increases the efficiency of the food supply (Smit et. al. 2001a).

Urban food security is often contingent on urban agriculture, particularly for millions of urban poor who depend heavily on cash for procuring food. With undependable day labor or insufficient income, self-production is a critical strategy for food security. A majority of urban farmers are low-income agriculturalists, producing first for household consumption. Improving household food security and well-being is the main motive for the poor to farm in cities, as is shown by the repeated evidence from countries in Asia, Africa, and Latin America (Smit et. al. 2001a).

Food insecurity or food poverty exists when every person, whether infant, child, adult or elder does not have ready/daily/sustainable access to nutritious, culturally acceptable food. Food security exists then when an individual, family, community, city, region, or country has adequate income and a stable food system that assures both individual and group sustainable daily and year-round access to a nutritious and culturally acceptable diet.

Food security is becoming an increasingly critical issue as the rate of urban poverty rises, and evidence indicates that food security and nutrition are worse among the urban poor than the rural poor. A study undertaken by IFPRI in eight large countries (representing two-thirds of the global population) found poverty to be increasing in urban areas more than in rural, and the locus of poverty shifting to urban areas. Although on average the nutritional status of children (stunting and underweight) is better in urban than in rural areas, intra-urban differentials among the rich and poor are very high. In cities, malnutrition, morbidity from diarrheal diseases and parasitic infections, and infant mortality are up to three times higher in lower income areas than in upper income areas.

Food security for the poor is more difficult in urban areas because: self-production is lower and dependence on cash to purchase food is higher, urban areas have fewer community safety nets, and complex formal supply channels that are subject to failure. Poor urban households often pay more for food than richer urban residents because they purchase small quantities and must travel further to reach places where food costs less (Smit et. al. 2001a).

In most low-income cities, non-farmer food costs represent a substantial share of total household expenditures. In urban areas of low-income countries, 40-70 percent of the family budget is spent on food and fuel. The poorest people in those cities often spend 60-90 percent of their budgets on food, often facing hunger when they cannot afford such price levels. Thus urban agriculture can make a substantial contribution to the economy of poor urban households (Smit et. al. 2001a).

Generally, urban agriculture is one of the essential components of community food security, and should be incorporated into any strategy that seeks to achieve its objectives. Urban agriculture has a special capacity to strengthen access to food by low-income and other vulnerable groups.

2.7 Empirical Literature on Food Security/Insecurity in Ethiopia

Ethiopia has designed food security strategy and started implementation since 1996 (Eneyew, 2010).The aim of the program was improving the food security of the vulnerable population of 15 million people. These were considered as most food insecure out of which 5 million are chronically food insecure and 10 million people are increasingly vulnerable to shocks and subject to transitory or acute food insecurity in times of drought (FSCB, 2002).The national food poverty index declined from 38% in 2004/05 to 33.6% in 2010/11 and from 42% in 1999/00 to 38% in 2004/05 (MoFED, 2012). In rural households the food poverty index declined from 38.5% in 2004 to 34.7% in 2010/2011. The food poverty line per adult equivalent per year is 1985 birr in 2010/2011. According to ministry of finance and

economic development the food poverty line used in Ethiopia is based on a basket providing 2200 kcal per adult equivalent per day.

The dependency on undiversified livelihood based on low input application, low output and dependence on rain fed agriculture causes food insecurity in Ethiopia (Eneyew, 2010). The agricultural production is low even in good rainfall years to meet the consumption needs of the population (Devereux, 2000). Adverse climate changes (drought) combined with high human population pressure, environmental degradation; technological and institutional factors have led to a decline in the size of per capita production and have resulted in a growing problem of food insecurity in Ethiopia (MoFED, 2002).

2.7.1 Major components of food security program in Ethiopia

The major components of food security program in Ethiopia are improving productivity and production by the rural households by diffusing agricultural technologies such as fertilizer, improved seeds, and pre and post-harvest technologies (MoFED, 2012). Enhance the contribution of the livestock sector in food security through crossbred, improved nutrition and health care. Expand and strengthen irrigation schemes to pursuit food security in order to reduce dependency on rain-fed agricultural and increase production. Improve land-use practice for continuous economic growth. These are soil and water conservation, and management of natural resources. Build human and institutional capacity by expanding education and health service. Improve the provision of clean drinking water to keep people health and more productive. Expand rural market services, and strengthens off-farm employment opportunities through enhancing infrastructure, strengthening cooperatives unions, expanding microfinance and National Commodity Exchange System. Implement resettlement program to exploit under-utilized land to bring into economic use resulting in the improvement of the welfare of the resettled people Astatke (2002) as cited by Eneyew (2010).

2.7.2 Conceptualizing household food security/insecurity

Food security as a concept has originated only in the mid-1970s. This time, food crises become international level problem (Clay, 2002). The definition of food security has thus

evolved over time, mirroring the paradigm shifts in the conceptualization of food security (Maxwell, 1996). Initially, the focus of food security was on the supply of food at national and international levels. However, the famines in the Sahel and East Africa in the 1970s revealed that adequate national and international supplies do not necessarily prevent widespread food insecurity. This highlighted the importance of the demand side in the food security equation. The seminal work of Sen (1981) captured the demand side of food security through his entitlement theory. He defined entitlement failures of two types: endowment failures when, for instance, crops fail due to drought in subsistence agriculture, and trade entitlement failures, when market rules change suddenly, an example being a rapid increase in prices. In both cases access to food by some sections of the society is diminished. Thus it is no longer credible to talk of food security as being a problem of food supply only. Nevertheless, adequate national or local food availability still remains a necessary condition for household food security (Nichola, 2006). World Food Summit (1996) declaration argued that food security is achieved when all people at all times have physical and economic access to sufficient, safe and nutritious food for a healthy and active life.

According to Krishnaraj (2005) food security is contingent on three basic parameters - availability, accessibility and affordability. Availability comes from production and related aspects of productivity that sustain a desired level of production. Accessibility is about distribution. People can afford food if they can buy it and have the means to do so. It is also possible to get food security through self-provisioning.

According to USAID (1995), Broca (2002), and Baldwins (2006) the components of food security are thus: the availability of food, or the amount of food that actually exists (local production and other sources); people's physical, economic and social access to food (the capacity to produce/buy/acquire food), and the stability of this access over time; the quality or nutritional adequacy of that food; and people's ability to utilize this food, including the patterns of control over who eats what and the physical ability to absorb nutrients. In this Thesis food security situation of household is be analyzed based on the four components of food security: availability, accessibility, utilization and stability.

The opposite of food security is food insecurity. According to Rahim et al (2011) food insecurity exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire foods in socially acceptable ways is limited or uncertain. Based on temporal dimension referring to the time frame over which food security is being considered, two types of household food insecurity can be distinguished. These are chronic and transient food security. Chronic (permanent) food insecurity is a continuously inadequate diet resulting from lack of resources to produce or acquire food, while transient food insecurity is a temporary decline in the household to access enough food (Devereux, 2006).

Often, the term 'food security' and 'household food security' are intermingled (Callens & Seiffert, 2003). Food security is defined in its most basic form as access by all people at all times to the food needed for a healthy and active life. The focus of food security is the households as the basic social unit in a society. This distinction is important because activities directed towards improving household food security may be quite different from those aimed at improving national level food security. The former often being more related to micro-level production, marketing, distribution and acquisition of food by the population as a whole (Callens & Seiffert, 2003). At the micro level a household may be either: a one person household that is a person who makes provisions for his/her own living alone or a multi-person household who pool their income and have a common budget to a greater or lesser extent (CSA, 2009).

Scholars such as Kennedy, E, cogill (1988), Eide,WB (1990), defined more or less similar definition on household food security. According to United Nations (1990) household food security essentially refers to the ability of household members to assure themselves sustained access to a sufficient quantity and quality of food to live active, healthy lives. This may occur as a result of adequate home production of food and/or adequate economic and physical access to food. Economic access comes from an adequate purchasing power, while physical access refers to the proximity of markets or other distribution channels of food through which food may be acquired and the safety of their food supply is ensured.

Household food security is also concerned with food distribution within the household and priorities related to food production, acquisition, utilization and consumption. The focus is thus not just on food but also on people and households and how they give shape to the food chain. Household food security gives a closer look at vulnerability factors within the household as well as external sources of vulnerability. This can include national policies, environmental conditions, access to infrastructure and facilities, etc.

Household food insecurity has been defined by national experts as "limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways (Stuff, et al.2004, Campbell, 2012).According to Shumiye (2007) a household is said to be food insecure when its consumption (available food) falls below the daily standard Minimum Recommended Allowance (MRA) of caloric intake.

2.7.3 . Indicators of household food security

In most analyses of food security conditions in developing countries, multiple indicators are used by different scholars to reflect the various dimensions of the problem. Some of the most commonly used types of indicators in the assessment of food security conditions are food productions which include intensification, diversification, and yield. Household income, total expenditure, food expenditure, share of expenditure on food, calorie consumption, and nutritional status are also important food security status measures of a household (Riely, Cogill, Bailey, & Kenefick, 1999).

According to Hoddinot (2002) household food security is measured by dietary diversity of household. This is the sum of the number of different foods consumed by an individual over a specified time period. It may be a simple arithmetic sum, the sum of the number of different food groups consumed. To collect data one or more persons with in the household are asked about different items that they have consumed in a specified period. These questions can be asked to different household members where it is suspected that there may be differences in food consumption among household members. The advantage of this

method is that, it is easy to train enumerators to ask these questions and individuals generally found the questions easy to answer. The disadvantage of this measure is that the simple form of this measure doesn't record quantities.

According to John Hoddinot (1999) there are four ways of measuring household food security. These are individual intakes, household calorie acquisition, dietary diversity, and indices of household coping strategies. The individual food intake method measures the amount of calorie or nutrient consumed by an individual within 24 hours. In this Thesis, dietary diversity was used due to assumptions constructed on the improvements in food availability, access, utilization and stability over the 12 months of the year at household level; most specifically due to engagement of the household in farming activity. It measures also how households adapt or cope to food shortages.

Chapter Three: Research Methodology

This chapter has presented an account of the research methodology that has been used in conducting the study. Accordingly, the research procedures and methods that have been utilized during the study are laid out in the following manner. It also has provided the details about the instruments of data collection and the process by which the data have been analyzed.

3.1. Research Method

The study was aimed at evaluating the hypothesis that "urban agriculture is practiced by urban poor households and improves the food security of these households". A quantitative & qualitative research methodological approach was employed in this study. This was because it allows for meaningful comparison of responses across the participants and study sites. This research method was selected by the assumption that the results of the research will confirm the positive contribution of urban agriculture on household food insecurity of urban poor at household level.

3.2. Research Design

The purpose of this study was to uncover the contribution of urban agriculture in alleviating urban food insecurity. Therefore, a comparative research design has been employed to address the study's basic research questions and meet its objectives effectively. This study design was found to be appropriate to examine the contributions of urban agriculture in reducing urban food poverty among poor urban households that practice urban agriculture and compare the results with the food security status of poor urban households that don't practice urban agriculture.

3.3. Sample Size Determination and Sampling Design

The study has been conducted in selected kebles of the Akaki-kaliti sub-City of the Addis Ababa City administration. This specific site was selected as a study area given that the performance of urban agriculture is relatively higher in this particular sub-City. Akaki-kaliti ranked first in performance in five out of ten urban agriculture sub-systems out of the ten sub-Cities (Walta Information Center 2014). See 'Table 16' in the appendices.

The target population of the study was composed of individual producers at household level (focusing on households with low income and unemployed) and urban agriculture stakeholders found in the study area. On the basis of the information obtained from the Akaki-Kaliti sub-City Urban Agriculture Office, there are 2952 households that practice urban farming in the Akaki-Kaliti sub-City. The 2952 farmers found in the sub city area were used as the 'sampling frame' of the study. Accordingly, a sample size of 100 households has been included in the study's survey.

Since the study's target population was composed of two distinct groups (i.e. individual producers and stakeholders), different sampling techniques have been utilized in the study. First, among the eleven Woredas of the sub-City, some of them have been purposively selected on the basis of the extent of urban agriculture activities as specific sites of data collection. Second, individual producers have been stratified based on the level of poverty (i.e. in monetary measures). Accordingly, those urban producers with a daily average income of 1.25 USD and below have been selected to participate in the study. Third, a Random Sampling Strategy (RSS) has been employed to determine a representative sample from the selected group of individual producers. Fourth, poor urban households that are not engaged in urban agriculture have been randomly selected on the basis of income (i.e. those households with a daily average income of 1.25 USD and below). Accordingly, equivalent sample sizes (i.e. 50 participants from the two groups) have been selected for all clusters since the intention of the study was to understand the contributions of urban farming to urban household food security. While, urban agriculture stakeholders that were found in the study area (specifically, in Woredas) have been purposively selected as participants of the study.

3.4. Variables of the Study

The study has undertaken an assessment on the role of urban agriculture in alleviating urban food insecurity. Accordingly, urban agriculture and urban food insecurity have been the main variables of the study; i.e. urban agriculture has been considered as the independent variable (IV) and urban food insecurity as the dependent variable (DV).

Hypothesis: Urban agriculture plays a positive role in ensuring urban household food security.

- Accordingly, the working hypothesis of the study has been presented as follows.
  Poor households that are engaging in urban agriculture are likely more initiated to grow crops, increase availability of nutritious food over the year and are more likely to be better food secured. The reverse is true for poor households that aren't engaging in urban agriculture. It is expected that there is positive relation between engagement in urban agriculture and food security of a household.

Indicators of Measurement:

1. Households engaged in urban agriculture have an increased number of eating occasions per day in comparison with those who are not engaging.
2. Households engaged in urban agriculture consume a variety of food groups in comparison with those who are not engaging.
3. Households engaged in urban agriculture face minimal food shortage occurrences in comparison with those who are not engaging (in terms of daily meal schedules).
4. Households engaged in urban agriculture face less prolonged food shortages in comparison with those who are not engaging (in terms of months of the year).

3.5. Methods of Data Collection

This sub-section has addressed the specific data sources, collection instruments, methods, and procedures that have been employed in the study.

In the study, the researcher has exploited both primary and secondary sources of data to collect the necessary and appropriate data. That is, a combination of qualitative and quantitative data has been used as an input for the analyzing the hypothesis. The researcher has applied a variety of methods to achieve triangulation or confirmation of the same information by different sources thereby to increase the validity of the results. In view of this, interview and survey questionnaire have been used as the primary data gathering tools.

Secondary data required for the study have been acquired by reviewing published or unpublished, written or unwritten documents including archive research.

Interviews have been conducted with urban agriculture stakeholders in order to find out the extent of the actual practices of urban agriculture and the policy support that is rendered to the sector. On the other hand, survey questionnaires have been administered to a sample of individual producers to gather the necessary data required for assessing the contributions of urban agriculture in reducing urban food insecurity at the household level.

3.6. Methods of Data Analysis

Analysis of data in a research project involves summarizing the mass of data collected and presenting the results in a way that communicates the most important features. In this sub-section, the study's data analysis strategy or the specific procedures followed to address each of the research questions and the nature or form of the expected results have been laid out.

Since the study has been guided by a quantitative research methodology, the necessary data has been collected, analyzed and displayed in numerical rather than narrative form. During this phase, the collected data has be checked, organized, and entered into the code sheet. The data sheet has been used also to clean data sets (separate analyzable data from the rest). Following, a computerized data summarization technique (using SPSS version 20), the data has been analyzed using appropriate forms of presentation. Descriptive statistics, cross-tabulations, including frequency counts, percentages, and other relevant data analyses presentation forms have been utilized in the study.

Chapter Four: Data Results and Interpretation

The Role of Urban Agriculture in Alleviating Urban Food Insecurity is analyzed in this Chapter. This study was aimed at assessing the contribution of urban agriculture in alleviating urban food insecurity at the household level in Addis Ababa with particular reference to the Akaki-Kaliti sub-City. The following sub-sections provide the demographics, analyses, and findings of the study.

4.1. The Context of Urban Food Insecurity in the Study Area

Urban food insecurity is a growing concern due to the toxic combination of high rates of urban poverty, high dependency of urban households on food supplied by the market, and fluctuating food prices. Household food insecurity was particularly high among low income households and those daily wagers and government employed household heads. According to the Interim Report on Poverty Analysis Study (2010/11), the proportion of the population below the poverty line in urban areas was 25.7%, while the proportion of 'food poor' people (people who could not purchase the consumption items that generate 2, 200 kilo calories) in urban Ethiopia was estimated to be 27.9% in 2011. The majority of urban households in Ethiopia (over 80%) are dependent on markets for their food supply.

Since August 2004, the Ethiopian food price index has been consistently higher than the world index. According to the Central Statistical Agency, year-on-year food inflation in February 2012 increased by 47.4% compared to February 2011, while non-food inflation increased by 21.4% within the same period. In February 2012, increases were observed in the prices of cereals, pulses, vegetables, fruits and spices. In large metropolitan areas such as Addis Ababa, household food security is being threatened by a combination of forces: a predominantly market-based food supply, persistent chronic poverty, and rising food prices. A baseline national food security survey in 2009 by the Ethiopian Health and Nutrition Research institute (EHNRI) reported that 35 percent of households in Ethiopia were food insecure, while the magnitude of food insecurity among volunteer AIDS care givers in Addis Ababa in 2009 was about 81%.

Hence, it's in this urban food poverty context that study has been deemed essential to assess the role of urban agriculture in alleviating urban food insecurity at the household level. The study has been conducted by taking a sample of urban poor households, both engaging in urban agriculture and their counterparts. Particularly, the study's sample included those low income households like daily wagers and other sections of the society found in similar socio-economic status.

4.2. Demographics of the Study

4.2.1. Socio-Economic Characteristics

In general, the study has addressed 105 participants in the data collection process. Among these, 5 are purposely selected key informants of the study. The rest 100 survey participants are randomly selected poor households (i.e. with a daily average income of 1.25 USD or 25 Birr and below) that are engaging in urban agriculture (i.e. 50 of them) and those who aren't engaging in urban agriculture (i.e. 50 of them).

Sex distribution in the sample of survey participants of the study has a ratio of 70 females to 30 males. Regarding the ages of survey participants, 37of them are within the 15-29 range, 39 of them are within the 30-49 range, 17 of them are within the 50-64 range, and the rest 7 participants are above the age of 64.

The marital status of the sample households also varies. The married constitute 43 percent of the total sample households, whereas the divorced constitute 19 percent and single participants' amount to 38 percent. 11 percent of the total sample households have only 1 child, 23 percent of the total sample households have 2 children, 17 percent of the total sample households have 3 children, and the rest 49 percent of the total sample households have 5 and above children.

Level of education also considerably varies within the sample of survey participants of the study. 67 percent of the sample households have completed primary education from grade 1-6, 25 percent of the sample households have reached grade 7-8, and the rest 8 percent of the sample households have reached grade 9-12.

Table 1 Study Participants' Socio-Economic Description

Demographic Variables	Category	Frequency
Sex	Male	30
	Female	70
	Total	100
Age	15-29	37
	30-49	39
	50-64	17
	Above 64	7
	Total	100
Marital Status	Single	38
	Married	43
	Divorced	19
	Total	100
Number of Children	1	11
	2	23
	3	17
	5 & Above	49
	Total	100
Level of Education	1-6	67
	7-8	25
	9-12	8
	Total	100
Average Daily Income	1.25 USD (25 Birr) & Below	100

Source: Survey Compilation, 2014

4.2.2. Types of Urban Agricultural Practices by Respondents

Various types of urban agriculture are practiced in Akaki-Kaliti sub-City. According to the Urban Agriculture Office of Akaki-Kaliti sub-City, urban agriculture is being practiced in 9 different categories or sub-systems including; poultry production, livestock and dairy production, cattle and sheep fattening, bee keeping, pig breeding, crop production, and vegetable production.

Table 2 Urban Agriculture Practices in Akaki-Kaliti sub-City

No.	Urban Agriculture Practices	Number of Farmers	Number of Livestock Farmers	Total Number of Urban Farmers
1.	Poultry	401	***1285***	***2952***
2.	Livestock and Dairy	502		
3.	Cattle Fattening	163		
4.	Sheep Fattening	108		
5.	Bee Keeping	99		
6.	Pig	12		
7.	Crop Production	974		
8.	Vegetable Production	655		
9.	Mushroom Production	38		

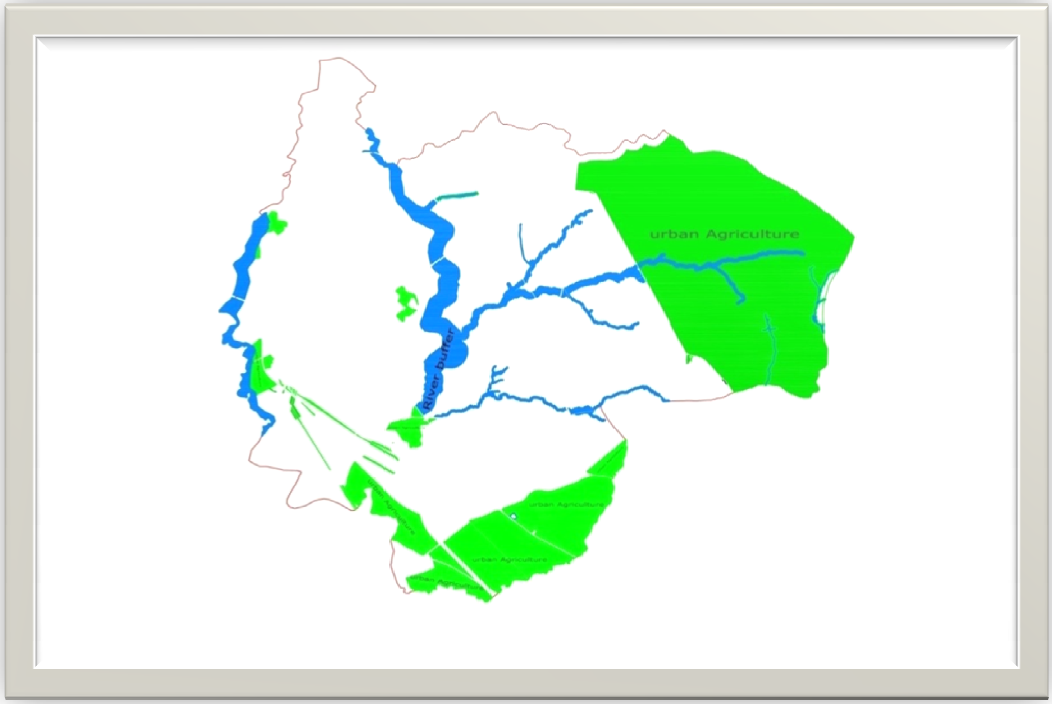
Source: Urban Agriculture Office of Akaki-Kaliti sub-City, 2014

As indicated above, urban agriculture in the Akaki-Kaliti sub-City includes different types of crops (grains, vegetables, mushrooms, etc.) or animals (poultry, sheep, cattle, pigs, fish, etc.) or combinations of these.

In similar case, vegetable and maize production is the most important production system in urban Accra, with a smaller percentage of the producers growing staples or keeping small livestock. Crops produced in peri-urban areas are mainly staples (maize, cassava, and plantain), while over a quarter of producers keep sheep and goats and/or poultry for commercial purposes. Livestock production is more dominant in the peri-urban areas as the free-ranging system of animal rearing can more easily be practiced there (World Bank 2013).

The following map demonstrates the area of Akaki-Kaliti sub-City Urban Agriculture in the New Master plan of Addis Ababa city Administration

Figure 2 Master Plan of Akaki Kaliti Sub City Administration



Source: Akaki-Kaliti sub-City Land Management Bureau, December 2014

4.2.3. Groups of Households engaged in Farming Activities

According to the data gathered through the survey questionnaire, most of the poor urban households that are practicing urban agriculture were mainly driven by financial limitations (i.e. low income earning potential). This accounts 60 percent of the total sample of the study, i.e. sample of poor urban households that are practicing urban agriculture. The rest 40 percent of the sample of poor urban households that are practicing urban agriculture were engaged in the sector as a result of lack of employment opportunities and low food supply.

Also, the key informant response to the interview question on the reason for poor urban households to engage in urban agriculture reveals that the households are practicing urban agriculture due to problems unemployment and low income.

"The poor households in our sub-City mostly practice urban agriculture given that their engagement in the sector would generate an income." (Source: Researcher's Interview Transcript)

However, this does not mean that urban agriculture is exclusively an activity of the poor. There is evidence of participation by better-off groups who carry out farming in order to supplement or diversify their diets. Others also engage in urban agriculture to a larger scale with a primary goal of generating income. For example, Jacobi et al. (1999) found that while vegetable growing was common across all income groups in Dar as Salaam, Tanzania, the better-off had larger farms and tended to produce for the market.

Table 3 Households Practicing Urban Agriculture in Selected Kebeles of Akaki-Kaliti sub-City

No.	Reasons for Households Engagement in Urban Agriculture	Households Practicing Urban Agriculture	
		Frequency	Percentage
1.	Low Income Earnings	30	60
2.	Lack of Employment Opportunities	12	24
3.	Low Food Supply	8	16

Source: Survey Compilation 2014

Food production in the selected location of the city is in many cases a response of the urban poor to inadequate, unreliable and irregular access to food, and the lack of purchasing power. In urban settings, lack of income translates more directly into lack of food than in a rural setting. Most cities in developing countries are not able to generate sufficient (formal or informal) income opportunities for the rapidly growing population.

Urban agriculture is also an important source of employment for people who may not successfully compete for formal sector jobs due to their low skill levels. It is estimated that 40% of urban dwellers in Africa are involved in agricultural and related sectors (Zezza and Tasciatti, 2010). In Nairobi in the early 1990s, agriculture provided the highest self-employment earnings among small-scale enterprises and the third highest earnings in all of urban Kenya (House et al. 1993). In Dar es Salaam urban agriculture is the second largest

urban employer (20 percent of those employed). Thus, just as agriculture provides the bulk of rural employment in Africa, urban families without formal employment can enhance their labour productivity by engaging in urban agriculture.

4.2.4. Stakeholders and Policy Supports Provided for Urban Agriculture

Urban and peri-urban agriculture is operating with the involvement of multi-stake holders from the government (both promoters and regulators), non government (local NGO, international NGOs and CSOs) and private sectors (micro and small enterprises, service providers and producer associations) (Addis Ababa City Administration 2013). These actors can be classified according to the five roles they fulfill: producing, regulating, facilitating, providing, and partnering. One organization can fulfill multiple roles simultaneously or through different components (Smit et. al. 2001).

Accordingly, the study has identified; Farmers, Regulation and Control Bureau, Environmental Protection Bureau, Sanitation and Beautification Bureau, Housing and Construction Bureau, Urban Agriculture Office, Land Administration Bureau, Health Bureau, and Micro and Small Scale Enterprise Bureau as the key stakeholders engaging in urban agriculture matters in Akaki-Kaliti Sub City. These stakeholders play several roles including; urban agriculture production activities, enforcement of laws and regulations affecting urban agriculture, ensuring the implementation of environmental protection codes, following up the respect of hygienic and health related codes of conduct and providing health service and information about poor agriculture practices cause health problems, facilitating credit provision and technical advice on financial matters, administrating land provision and utilization, handling building matters, and facilitating supply of agricultural inputs and providing extension services, technical advices and trainings in enhancing urban agriculture in the sub-City (Survey Compilation, 2014).

4.3. Analyses and Discussions

4.3.1. Urban and Peri-Urban Agriculture Policy

The Addis Ababa City Administration approved Urban and Peri-Urban Agriculture Policy and Strategy for the City with a view to eradicate poverty and improve the nutritional status of the community, specially the resource poor in the urban community.

The Addis Ababa Urban and Peri-Urban Agriculture policy and strategy document provides a sound policy and implementation framework that promotes Urban and Peri-Urban Agriculture policy in an effort to improve food security, income and employment of the urban community in an environmentally friendly, socially inclusive and gender sensitive manner. The main purpose of this policy and strategy document is to mobilize the Addis Ababa City Administration and residents to appreciate urban and peri urban agriculture to engage in Urban and Peri-Urban Agriculture policy as a self-reliance strategy towards growth and transformation plan and the-Vision of Ethiopia to be a middle level income country by 2020 (Addis Ababa City Administration 2013).

The Trade and Industry Development Bureau of the Addis Ababa City Administration has enacted the 'Urban and Peri-Urban Agriculture Policy and Implementation Strategy Document' in February, 2012. Accordingly, the City Government has recognized urban agriculture as one of the important tools to end the widespread problem of urban food insecurity. This has been clearly reflected in the endorsement of the aforementioned policy document and acceptance of urban agriculture as an integral component of the City's Master Plan. This is a critical step in the creation of a favorable policy environment for a sustainable development of the sector in the city.

In general, the policy is expected to:- a) assist the Addis Ababa City Administration in promoting and supporting the development of a well-organized, viable and sustainable urban agriculture; b) provide guidelines in the implementation of urban agriculture programs and projects throughout the City addressing the major policy issues; c) assist the local authority in the integration of Urban Agriculture in its socioeconomic system as a legitimate land use

and economic activity and its institutionalization; and d) address key issues, challenges and proposals for their resolution (Addis Ababa City Administration 2013).

The principal concern of this policy is to promote urban farming as a strategy for greener city, social inclusion, enhance food security, poverty reduction and local economic development for the poor. Particularly, the policy envisaged to eradicate poverty and improve the nutritional status of the community, specially the resource poor in the urban community. In order to attain the goals of the policy, the document has presented specific objectives and the subsequent strategies.

The policy document maintains that urban agriculture operates under special urban conditions that tend to be challenging, coupled with urban producers limited access to support services (training, business development, advisory, research, credit & finance and input) (Addis Ababa City Administration 2013).

4.3.2. Urban Agriculture: the Case Lesson of Accra, Ghana

Vegetable farming in Accra has a long-standing history, dating to the British colonial era. Since then, urban farming has become widely practiced. As the population of Accra has increased, so has the number of people involved in urban farming, at least half of the city's households involved in the practice. Empirical studies show that two primary types of cultivation are practiced, enclosed cultivation (or backyard cultivation) and open cultivation (Arku et. al. 2012).

Enclosed cultivation is primarily for household consumption and is practiced on building lots that may or may not be walled. Because enclosed cultivation occurs on private land, those who engage in this type of farming are typically land owners or caretakers of such lands. Most enclosed cultivation occurs in the Accra suburbs due to inadequate space within the city center. In contrast, open-space farming is prevalently practiced on unused community and public lands. There are different tenure arrangements for the use of the urban open spaces, but in general, no farmer owns the land and very few of them pay a fee. Unlike

enclosed cultivation, much of the open cultivation occurs around the city center by residents of lower socio-economic status, often indigenous people and rural migrants (Arku et. al. 2012).

The most commonly cultivated crops are vegetables (e.g., cabbage, carrots, spring onions, Green-pepper, cucumber, lettuce, Kontomire, spinach) and such crops as maize, fruits, cereal, root crops, and leguminous crops—depending on the location and availability of water. Due to the amount of water needed for vegetable farming, most farm plots are located close to streams and rivers (e.g., Rivers Onyasia and Odaw), wetlands (e.g., Korle Lagoon), and storm water drains. Open space farmers may also use pipe-borne water and water from hand-dug wells (Arku et. al. 2012). Other components of urban farming in Accra are poultry, small ruminants, dairy farming, aquaculture, and other short-cycle species, such as mushrooms and grass cutters (Thryonomys swinderianus), a leading source of protein in the Guinea savannah (Arku et. al. 2012).

Urban farming in Accra is largely informal in character and occurs outside the official city planning framework. As such, the full measure of the city's land used for agricultural cultivation is difficult to determine. However, estimates by Resource Centers on Urban Agriculture and Food Security (RUAF-Foundation) suggest that about 680 ha of urban land are under maize cultivation, 47 ha under vegetables and 251 ha under mixed cereal-vegetable systems. Irrigated vegetable production takes place on a 100 ha area in the dry season. Results from the same survey suggest that about 1,000 farmers were involved in rain-fed and irrigated urban agriculture to produce exotic vegetables (e.g., cauliflower) or more traditional vegetables, such as tomatoes, okra, eggplant, and hot peppers. Plot sizes range between 0.01–0.02 ha per farmer (Arku et. al. 2012).

About 90% of all food consumed in Accra is purchased from the market (IFPRI, 2003). This implies that the practice of urban agriculture, if properly managed, could ensure ready access to food by households. Urban agriculture can also help address future food security issues in the city in light of the global climate change phenomenon. Presently, the demand for perishable products is high in Accra and is expected to increase due to persistent population

expansion. Studies have shown that urban agriculture can have an enormous impact on the food security and nutrition of Accra's residents (Arku et. al. 2012).

According to Arku et. al. 2012, the key contributions of urban agriculture in Accra can be summarized as follows. These are: -food for the urban poor, source of nutrition, achievement of sustained livelihood, poverty reduction, food security (niche market), employment and household earnings, creation of economic activities, and empowerment of women.

4.3.3. Role of Urban Farming in Filling Food Gap: Evidence from Study Area

a) Measurement on Food Availability

In this sub-section, number of eating occasions per day is used as an indicator variable for measuring food availability among the study's sample households. Accordingly, the researcher has calculated average income and eating occasions per day for both groups of survey participants (i.e. those who are engaging in urban agriculture and those who are not engaging in urban agriculture) of the study.

Table 4 Eating Occasions per Day

Average Daily Income (ADI) of Sample Households	No.	Count of Meals Per Day (CMD)	Sample Households Engaging in Urban Agriculture **(a)**		Sample Households Not Engaging in Urban Agriculture **(b)**	
			Frequency (n=50)	Percentage (n=50)	Frequency (n=50)	Percentage (n=50)
Approximately 23 Birr	1.	0 Meals	-	-	-	-
	2.	1 Meal	-	-	17	34
	3.	2 Meals	7	14	33	66
	4.	3 Meals	43	86	-	-
	5.	4 Meals	-	-	-	-

Source: Survey Compilation, 2014

The following SPSS analyses indicate the final measurements among the two groups of sample households.

Table 5 Descriptive Statistics

Households Engaging in Urban Agriculture **(a)**						Households Not Engaging in Urban Agriculture **(b)**					
Variables	N	Min.	Max.	Mean	SD	Variables	N	Min.	Max.	Mean	SD
Average Daily Income (a)	50	21	25	23.20	1.143	Average Daily Income (b)	50	21	25	22.86	1.355
Count of Meals Per Day (a)	50	3	4	3.86	.351	Count of Meals Per Day (b)	50	2	3	2.66	.479

Source: Survey Compilation, 2014

Table 6 Cross-tabulation Statistics

Average Daily Income (a & b) * Count of Meals per Day (a & b)

Cross-tabulation (a)		Count of Meals Per Day **(a)**		Total	Cross-tabulation (b)		Count of Meals Per Day **(b)**		Total
		2 Meals	3 Meals				1 Meals	2 Meals	
Average Daily Incomes (a)	21	4	0	4	Average Daily Incomes (b)	21	9	0	9
	22	3	6	9		22	8	5	13
	23	0	17	17		23	0	13	13
	24	0	13	13		24	0	6	6
	25	0	7	7		25	0	9	9
Total		7	43	50	Total		17	33	50

Source: Survey Compilation, 2014

The above descriptive analysis shows that there is no significant difference among the two distinct groups of survey participants of the study in terms of their average daily income (i.e. an approximately similar value of 23 Birr per day). However, there is a significant difference in terms of the average number of eating occasions per day among the two groups. That is, those who are engaging in urban agriculture has recorded a 3.86 Mean value on eating occasions per day (with a minimum value of 2 Meals per day and a maximum value of 3 Meals per day) and those who are not engaging in urban agriculture has recorded a 2.66 Mean value on eating occasions per day (with a minimum value of 1 Meal per day and a maximum value of 2 Meals per day).

This significant variation on average eating occasions per day must have resulted due to the engagement of one the groups in urban agriculture; since the sample households of the study seem to have similar socio-economic status. This entails, those poor urban households who are engaging in urban agriculture have more meals per day than their counterparts (i.e. those poor urban households who are not engaging in urban agriculture). Consequently, the above

analyses show that engagement in urban agriculture determines food availability positively and significantly in the study's sample of poor urban households.

Following, the above analyses results are displayed in the form of bar chart for an easier comparison. The bars in the left side show the analysis in the sample of poor urban households who are engaging in urban agriculture (i.e. Diagram 1: Eating Occasions vs. Average Daily Income (a)). The bars in the right side show the analysis in the sample of poor urban households who are not engaging in urban agriculture (i.e. Diagram 2: Eating Occasions vs. Average Daily Income (b)).

In the 'Diagram 1' below, 'Red Bars' represent '2 Meals per day' and 'Yellow Bars' represent '3 Meals per day' in. Whereas In 'Diagram 2' 'Blue Bars' represent '1 Meal per day' and 'Green Bars' represent 2 Meals per day.

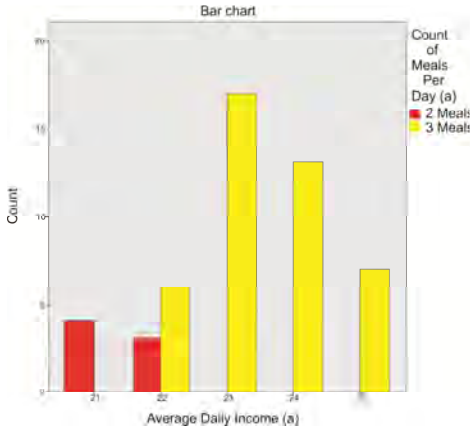


Diagram 1. Eating Occassions vs. Average Daily Income (a)

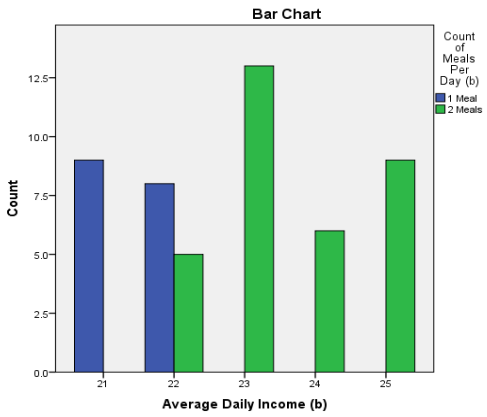


Diagram 2. Eating Occassions vs. Average Daily Income (b)

Urban agriculture contributes to improved food availability status (Bryld, 2003). The local productions of food, and associated local marketing of fresh and processed products, increase the food security of the poor by making food locally available, and at lower prices, and by improving the nutritional balance of the family diet. Creation of better conditions for peri-urban and urban families to produce and market vegetables, fruits, livestock products and fish, can positively affect the nutrition and health of vulnerable urban groups.

For example, a significant number of people in cities such as Accra and Dar es Salaam increasingly depend on crops grown in public spaces for food and income (De Zeeuw, et al., 2010). Also, the empirical study conducted on urban agriculture by Zezza and Tasciotti (2010) revealed that, households that engage in farming may have access to comparatively cheaper food and to a wider variety of particular nutritious foods such as vegetables and products of animal origin (milk, egg, and meat). The same study highlights urban agriculture does appear to be associated with greater dietary diversity and calorie availability, both measures of an improved diet and hence closely related to food security.

b) Measurement on Food Access

In this sub-section, the indicator known as Household Dietary Diversity Score (HDDS) is employed to assess improvements in food security in terms of food access within the study's sample of poor urban households. Ruel (2002) has defined dietary diversity as the number of different foods or food groups consumed over a given reference period usually measured by summing the number of foods or food groups consumed over a reference period.

In this study, this indicator has been evaluated in terms of the total number of food groups consumed to capture dietary diversity in a reference period of one day. That is, by taking the total/summation of the number of types of food groups consumed by the sample households in a single day. The number of different foods or food groups (see: list of food groups and contents of each group, at the appendices) consumed in a given household provides a measure of the quality of the diet by reflecting dietary diversity among the two distinct sample groups of the study.

Accordingly, the average number of different food groups consumed by the sample households (i.e. both poor households engaging in urban agriculture and those who aren't engaging) is calculated and analyzed as a quantifiable measure of relative household food access by using a 24 hours recall method as follows.

Table 7 Food Groups Consumed per Day

Average Daily Income of Targeted Households	No.	Count of Food Groups Consumed Per Day	Sample Households Engaging in Urban Agriculture **(a)**		Sample Households Not Engaging in Urban Agriculture **(b)**	
			Frequency (n=50)	Percentage (n=50)	Frequency (n=50)	Percentage (n=50)
Approximately 23 Birr	1.	1 Group	2	4	23	46
	2.	2 Groups	3	6	13	26
	3.	3 Groups	5	10	14	28
	4.	4 Groups	11	22	-	-
	5.	5 Groups	18	36	-	-
	6.	6 Groups	11	22	-	-
	7.	7 Groups	2	4	-	-
	8.	8 Groups	-	-	-	-
	9.	9 Groups	-	-	-	-
	10.	10 Groups	-	-	-	-
	11.	11 Groups	-	-	-	-
	12.	12 Groups	-	-	-	-

Source: Survey Compilation, 2014

The following SPSS analyses clearly indicate the final measurements among the two groups of sample households.

Table 8 Descriptive Statistics

Households Engaging in Urban Agriculture						Households Not Engaging in Urban Agriculture					
Variables	N	Min.	Max.	Mean	SD	Variables	N	Min.	Max.	Mean	SD
Average Daily Income (a)	50	21	25	23.22	1.112	Average Daily Income (b)	50	21	25	22.94	1.114
Count of Food Groups Consumed Per Day (a)	50	1	7	4.54	1.417	Count of Food Groups Consumed Per Day (b)	50	1	3	1.82	.850

Source: Survey Compilation, 2014

Table 9 Cross-tabulation Statistics

Average Daily Income (a & b) * Count of Food Groups Consumed per Day (a & b)

Cross-tabulation (a)		Count of Food Groups Consumed Per Day (a)							Total	Cross-tabulation (b)		Count of Food Groups Consumed Per Day (b)			Total
		1	2	3	4	5	6	7				1	2	3	
Average Daily Incomes (a)	21	2	1	0	0	0	0	0	3	Average Daily Incomes (b)	21	8	0	0	8
	22	0	2	5	3	0	0	0	10		22	5	0	0	5
	23	0	0	0	8	9	0	0	17		23	10	12	0	22
	24	0	0	0	0	7	6	0	13		24	0	1	11	12
	25	0	0	0	0	0	5	2	7		25	0	0	3	3
Total		2	3	5	11	16	11	2	50	Total		23	13	14	50

Source: Survey Compilation, 2014

The above descriptive analysis shows that there is no significant difference among the two distinct groups of survey participants of the study in terms of their average daily income (i.e. an approximately similar value of 23 Birr per day). However, there is a significant difference in terms of the average number of food groups consumed per day among the two groups. That is, those who are engaging in urban agriculture has recorded a 4.54 Mean value on food groups consumed per day (with a minimum value of 1 food group consumption per day and a maximum value of 7 food groups consumption per day) and those who are not engaging in urban agriculture has recorded a 1.82 Mean value on food groups consumed per day (with a minimum value of 1 food group consumption per day and a maximum value of 3 food groups consumption per day).

This significant variation on average food group consumption per day must have resulted due to the engagement of one of the groups in urban agriculture; since the sample households of the study seem to have similar socio-economic status. This entails, those poor urban households who are engaging in urban agriculture have more food group consumption per day than their counterparts (i.e. those poor urban households who are not engaging in urban agriculture). Consequently, the above analyses show that engagement in urban agriculture determines food access positively and significantly in the study's sample of poor urban households.

Following, the above analyses results are displayed in the form of bar chart for an easier comparison. The bars in the left side show the analysis in the sample of poor urban households who are engaging in urban agriculture (i.e. Diagram 3: Food Group Consumption vs. Average Daily Income (a)). The bars in the right side show the analysis in the sample of poor urban households who are not engaging in urban agriculture (i.e. Diagram 4: Food Group Consumption vs. Average Daily Income (b)).

In Diagram 3, the bars colored in 'Blue, Green, Grey, Purple, Yellow, Red, and Light Blue' represent 'consumptions of only 1, 2, 3, 4, 5, 6, and 7 food groups' respectively. In Diagram 4, the bars colored in 'Orange, Pink, and Black' represent 'consumptions of only 1, 2, and 3 food groups' respectively.

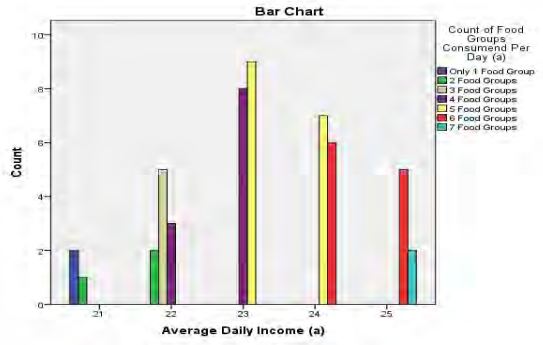


Diagram 3: Food Group Consumption vs. Average Daily Income (a)

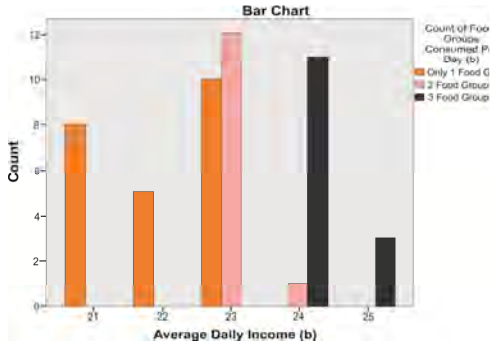


Diagram 4: Food Group Consumption vs. Average Daily Income (b)

Urban agriculture can be an important source of nutritional security (Gillepse, 2006). The empirical study conducted on urban agriculture by Zezza and Tasciotti (2010) also highlights that urban agriculture does appear to be associated with greater dietary diversity and calorie availability, both measures of an improved diet and hence closely related to food security. Resources freed by self-production of food can be used utilized to compliment household diets by purchasing other nutritious food items such as fish, fruits and vegetables (Bryld, 2003).

Thus self-grown food can reduce well-known challenges that the urban poor face, especially the dangers of meeting their household food and nutrition security entirely via the market.
This suggests that urban agriculture contributes to food diversification through increased availability of household disposable income (Zezza and Tasciotti, 2010). With more diverse foods available, households become more food secure (Swindale and Bilinsky, 2006).

c) Measurement on Food Adequacy

In this sub-section, an attempt is made to measure food adequacy as an indicator variable for evaluating food security within the study's target population. The result of an investigation that has been carried out to assess extent of food adequacy in the last 12 months on comparative basis among both sample poor urban households engaging in urban agriculture and those who aren't engaging in urban agriculture is presented below.

The following table has organized and displayed the responses of the study's survey participants on the relevant survey question (i.e. 'did you get an adequate amount of quality and safe foods you preferred in the last 12 months?').

Table 10 Extent of Food Adequacy in the Last 12 Months

Average Daily Income of Targeted Households	No.	Response Categories	Sample Households Engaging in Urban Agriculture		Sample Households Not Engaging in Urban Agriculture	
			Frequency (n=50)	Percentage (n=50)	Frequency (n=50)	Percentage (n=50)
Approximately 23 Birr	1.	Never	37	74	-	-
	2.	Rarely	9	18	-	-
	3.	Sometimes	4	8	19	38
	4.	Often	-	-	24	48
	5.	Always	-	-	7	14

Source: Survey Compilation, 2014

Accordingly, the researcher has calculated average income and extent of food adequacy in the last 12 months for both groups of survey participants of the study and displayed the corresponding SPSS data analysis result in the following manner.

Table 11 Descriptive Statistics

Households Engaging in Urban Agriculture						Households Not Engaging in Urban Agriculture					
Variables	N	Min.	Max.	Mean	SD	Variables	N	Min.	Max.	Mean	SD
Average Daily Income (a)	50	21	25	23.20	1.143	Average Daily Income (b)	50	21	25	22.86	1.355
Food Adequacy Status Per Year (a)	50	1	3	1.34	.626	Food Adequacy Status Per Year (b)	50	3	5	3.76	.687

Table 12 Cross-tabulation Statistics

Average Daily Income (a & b) * Extent of Food Adequacy Status per Year (a & b)

Cross-tabulation (a)		Food Adequacy Status Per Year (a)			Total	Cross-tabulation (b)		Food Adequacy Status Per Year (b)			Total
		Never	Rarely	Sometimes				Sometimes	Often	Always	
Average Daily Incomes (a)	21	4		0	4	Average Daily Incomes (b)	21	9	0	0	9
	22	9	0	0	9		22	10	3	0	13
	23	17	0	0	17		23	0	13	0	13
	24	7	6	0	13		24	0	6	0	6
	25	0	3	4	7		25	0	2	7	9
Total		37	9	4	50			19	24	7	50

Source: Survey Compilation, 2014

The overlying descriptive SPSS analysis indicates that there is no significant difference among the two distinct groups of survey participants of the study in terms of their average daily income (i.e. an approximately similar value of 23 Birr per day). However, there is a significant difference in terms of the average extent of food adequacy status per year among the two groups. That is, those who are engaging in urban agriculture has recorded a 1.34 Mean value on food adequacy status per year (i.e. most of the poor urban households in this category faced food inadequacy almost 'never' in the last 12 months) and those who are not engaging in urban agriculture has recorded a 3.76 Mean value on food adequacy status per year (i.e. most of the poor urban households in this category face food inadequacy almost 'often' in the last 12 months).

Subsequently, there is a statistically significant difference in terms of the extent of food adequacy status per year among the two groups. This reflects that there is a strong and positive relationship among engagement in urban agriculture and food adequacy status within the study's target population. That is to say, significantly engaging in urban agriculture production would create a conducive or favorable environment whereby food adequacy will be substantially improved thereby promoting food security.

Following, the above analyses results are displayed in the form of bar chart for an easier comparison. The bars in the left side show the analysis in the sample of poor urban households who are engaging in urban agriculture (i.e. Diagram 5: Extent of Food Adequacy Status per Year vs. Average Daily Income (a)). The bars in the right side show the analysis in the sample of poor urban households who are not engaging in urban agriculture (i.e. Diagram 6: Extent of Food Adequacy Status per Year vs. Average Daily Income (b)).

In Diagram 5 below, the bars colored in 'Yellow, Red, and Orange' represent those households that faced food shortages in 'never, rarely, and sometimes' extents respectively. In Diagram 6, the bars colored in 'Blue, Green, and Grey' 'represent those households that faced food shortages in 'sometimes, often and always' extents respectively.

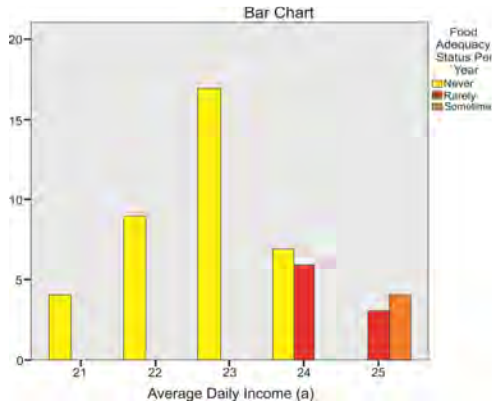


Diagram 5 Food Group Consumption vs. Average Daily Income (a)

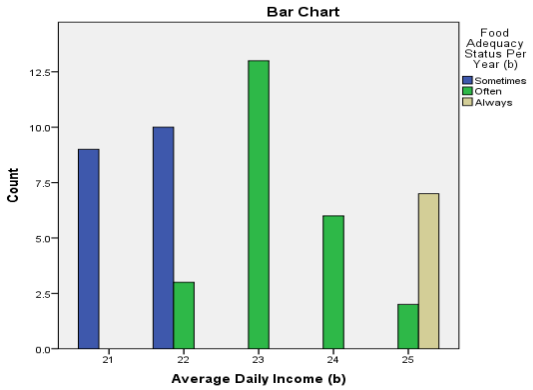


Diagram 6 Food Group Consumption vs. Average Daily Income (b)

In general, in most cities in developing countries, an important part of urban agricultural production is for domestic consumption, with surpluses being traded. In Nairobi, almost 300,000 households—perhaps as many as 1.18 million people—partly depend on urban agriculture for food and nutrition security and income. It is estimated that more than 650 hectares of land in Nairobi is under urban and peri-urban production.

d) Measurement on Food Stability

This sub-section is assigned to address the measurement concerning severity of food shortage occurrences in the last 12 months within the study's sample of poor urban households on a comparative basis. The following analyses are supposed to show severity of food shortage occurrences as a measure of relative food stability among the distinct groups of the study's survey participants (i.e. those who are engaging in urban agriculture and those who are not engaging in urban agriculture).

Table 13 Severity of Food Shortage Occurrences in the Last 12 Months

Average Daily Income of Targeted Households	No.	Durations of Food Shortages	Sample Households Engaging in Urban Agriculture		Sample Households Not Engaging in Urban Agriculture	
			Frequency (n=50)	Percentage (n=50)	Frequency (n=50)	Percentage (n=50)
Approximately 23 Birr	1.	For about <1 month	13	26	19	38
	2.	For about 1-3 months	-	-	24	48
	3.	For about 4-6 months	-	-	-	-
	4.	For about 7-9 months	-	-	-	-
	5.	For about >10 months	-	-	7	14

Source: Survey Compilation, 2014

The following SPSS analyses clearly indicate the final measurements among the two groups of sample households.

Table 14 Descriptive Statistics

Households Engaging in Urban Agriculture						Households Not Engaging in Urban Agriculture					
Variables	N	Min.	Max.	Mean	SD	Variables	N	Min.	Max.	Mean	SD
Average Daily Income (a)	50	21	25	23.20	1.143	Average Daily Income (b)	50	21	25	22.86	1.355
Severity of Food Shortage Occurrences Per Year (a)	13	1	1	1.00	.000	Severity of Food Shortage Occurrences Per Year (b)	50	1	5	2.04	1.293

Source: Survey Compilation, 2014

Table 15 Cross-tabulation Statistics

Average Daily Income (a & b) * Severity of Food Shortage Occurrences (a & b)

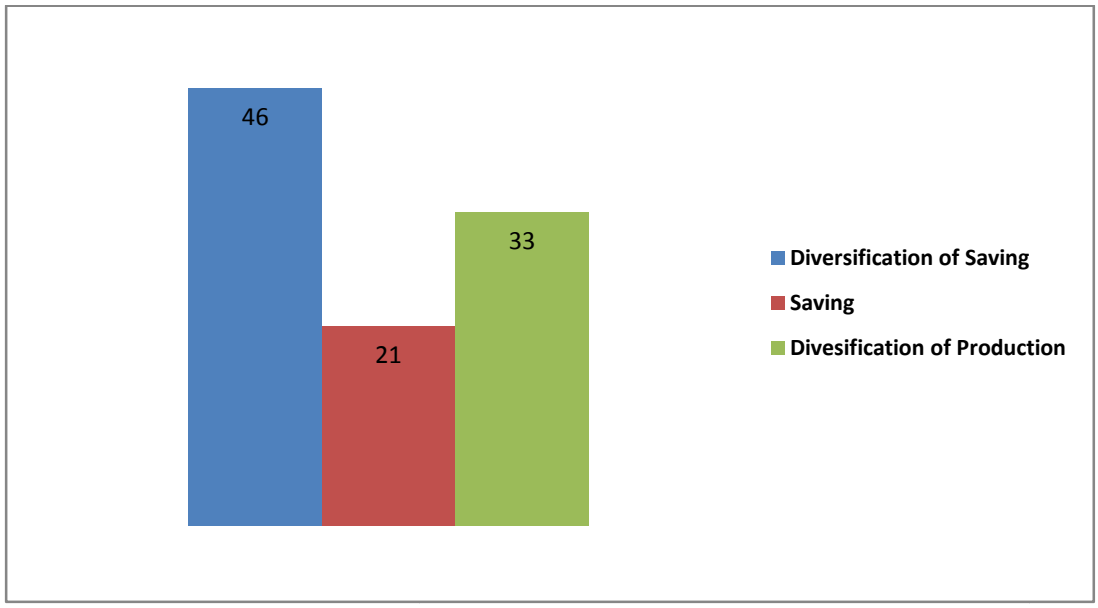
Cross-tabulation (a)		Severity of Food Shortage Occurrences Per Year (a) For about months of:-	Total	Cross-tabulation (b)		Severity of Food Shortage Occurrences Per Year (b) For about months of:-			Total
		<1 month				<1	1-3	>10	
Average Daily Incomes (a)	21	4	4	Average Daily Incomes (b)	21	9	0	0	9
	22	9	9		22	10	3	0	13
					23	0	13	0	13
					24	0	6	0	6
					25	0	2	7	9
Total		13	13	Total		19	24	7	50

Source: Survey Compilation, 2014

There is no significant difference among the two distinct groups of survey participants of the study in terms of their average daily income (i.e. an approximately similar value of 23 Birr per day). However, there is a significant difference in terms of the average severity of food shortage occurrences among the two groups. Poor urban households engaging in urban agriculture face food shortages for durations of less than 30 days. Moreover, in this category, the number of households facing food shortages amount to 13 out of 50 households (i.e. only 16% of the total households engaging in urban agriculture). The other group of poor households (i.e. those poor urban households not engaging in urban agriculture) faces food shortages with relatively greater durations than their counterpart. These households face food shortage occurrences with durations ranging from less than 30 days to more than 10 months of time.

The study's sample of poor urban households engaging in urban agriculture faces relatively lesser degree of food shortage occurrences. However, the question concerning the mechanisms of supplementing food needs in cases of shortages has to be answered given that production isn't year round. Accordingly, those poor urban households engaging in urban agriculture have developed certain ways of supplementing household food supply needs during food shortage occurrences. These mechanisms along with their frequency are briefly presented in the following pie chart.

Coping Strategies in cases of Food Shortage Occurrences



As clearly indicated in the above pie chart, the blue colored portion of the pie represents those poor urban households using diversification of production (example, poultry) as a coping strategy during food shortage occurrences. The red colored portion of the pie represents those poor urban households using saving (i.e. saving the income generated from earlier productions) as a means of gaining access to food supplies from the market. The green colored portion of the pie represents those poor urban households employing both diversification of production and saving as coping strategies in cases of food shortage occurrences.

Hence, on the basis of what the above SPSS descriptive analyses results indicate, food stability as a measure of food security has a statistically significant relationship with engagement in urban agriculture within the study's sample population composed of similar socio-economic status.

Following, the above analyses results are displayed in the form of bars charts for an easier comparison. The Diagram in the left side shows the analysis in the sample of poor urban households who are engaging in urban agriculture (i.e. Diagram 7: Severity of Food Shortage Occurrences vs. Average Daily Income (a)). The bars in the right side shows the analysis in

the sample of poor urban households who are not engaging in urban agriculture (i.e. Diagram 8: Severity of Food Shortage Occurrences vs. Average Daily Income (b)).

In Diagram 7, the bars colored in 'Orange' represent 'severity of food shortage occurrences of less than 1 month'. In Diagram 8, the bars colored in 'Blue, Green, and Grey' represent 'severity of food shortage occurrences of less than 1 month, 1-3 months, and more than 10 months' respectively.

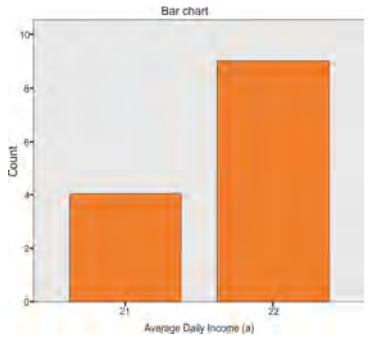


Diagram 7 : Severity of Food Shortage occurrences vs. Average Daily Income (a)

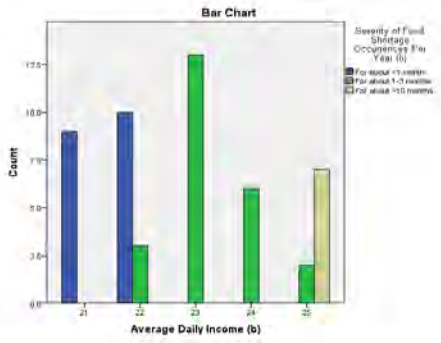


Diagram 8: Severity of Food Shortage occurrences vs Average Daily Income (b)

In most cases, the advantage of urban agriculture in combination with other occupations also enables producers to benefit from more diversified income sources, thus reducing vulnerability and enhancing the economic resilience of low income households, even if producers do not obviously benefit from higher incomes overall (World Bank 2013).

Chapter Five: Concluding Remarks and Recommendations

5.1. Concluding Remarks

The purpose of this comparative study was to investigate the contributions of urban agriculture in alleviating urban household food insecurity in the Akaki-Kaliti Sub-city. The study's target population is composed of both urban poor households engaging in urban agriculture and those who are not engaging in urban agriculture.

The study sought to investigate the relationship amongst the different dimensions of food security and the households' status in relation to engagement in urban agriculture along with their average daily income. Both quantitative and qualitative methodologies were employed in the study whereby structured questionnaires were prepared for the survey of randomly selected urban poor households with similar socio-economic status.

Discussions were also made with the purposively selected key informants and urban agriculture stakeholders in the Akaki-Kaliti sub-City. After completing required organization and coding or labeling of data, analyses were made by using the computer software called 'IBM SPSS Statistics 20' on the basis of information gathered through the stated methods. Following, interpretations of data analyses were made.

The study reveals people that are engaging in urban agriculture started their engagement due to low food supply at the household level, low income and unemployment. The results indicate that the role of urban agriculture for food security is manifested through different ways.

First, it was found out that engagement in urban agriculture determines food availability positively and significantly in the study's sample of poor urban households. That is, poor urban households who are engaging in urban agriculture are inclined to have more meals per day than their counterparts (i.e. those poor urban households who are not engaging in urban agriculture).

Second, it was found out that engagement in urban agriculture determines food access positively and significantly in the study's sample of poor urban households. That is, poor urban households who are engaging in urban agriculture are inclined to have more food group consumption per day than their counterparts (i.e. those poor urban households who are not engaging in urban agriculture). In this regard, an empirical study conducted on urban agriculture by Zezza and Tasciotti (2010) asserts, households that engage in farming may have access to comparatively cheaper food and to a wider variety of particular nutritious foods such as vegetables and products of animal origin (milk, egg, and meat). The same study highlights urban agriculture does appear to be associated with greater dietary diversity and calorie availability, both measures of an improved diet and hence closely related to food security.

Third, it was found out that engaging in urban agriculture production would create a conducive or favorable environment whereby food adequacy will be substantially improved thereby promoting food security. That is, there is a strong and positive relationship among engagement in urban agriculture and food adequacy status within the study's target population.

Fourth, it was found out that food stability as a measure of food security has a statistically significant relationship with engagement in urban agriculture within the study's sample population composed of similar socio-economic status.

In nut shell, urban agriculture contributes significantly and positively in alleviating urban household food insecurity in the study area, Akaki-Kaliti sub-City.

5.2. Recommendations

Based on the findings of this study the following possible recommendations and interventions in support of the sector have been made.

The Akaki-Kaliti sub-City administration in particular and Addis Ababa City administration in general should promote poor urban households engagement in urban agriculture. Poor urban farmers depended on urban farming as their sole source of income. Urban agriculture supplements people's incomes and also is important for survival for urban poor households. Thus, needs to appreciate the contribution of urban agriculture to the livelihoods of urban dwellers and to the local economies.

Urban agriculture stakeholders should continuously provide a technical advice, improved agricultural inputs and other necessities for those urban poor households engaging in urban agriculture. The small-scale farmers should be supported by providing functional, practical, and productive education and improved agricultural technologies, supplies and improved access to markets, as well as building the capacities of the local offices of urban agriculture through training to develop extension experts.

Urban agriculture should be integrated in the national food security programs of the country. In a labor-rich but capital poor country such as Ethiopia, urban agriculture should be encouraged, strengthened and given recognition in urban planning and development in all of the Federal and City levels of the country. Local and national governments should provide an appropriate structure of incentives to promote urban agriculture, including policies aimed at stimulating more effective market chains. The Federal Government should change its mind-set and see urban agriculture as a viable sector that could contribute to food security and nutrition of the urban poor dwellers. This can only happen if urban agriculture is viewed as an integral part of a broad national food security policy.

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Appendices

Appendix I: Instruments of Data Collection

a) **Interview Checklist: For Public Officials in the Akaki-Kaliti sub-City**

1) What types of urban agriculture practices are there in Akaki-Kaliti sub-City?
2) What kind of urban agriculture do poor households practice?
3) Where do poor households practice urban agriculture?
4) Why do poor households practice urban agriculture?
5) What kinds of stakeholders are involved in urban agriculture?
6) How do you facilitate urban agriculture activities?
7) What kind of support do you provide to the urban farmers?
8) How do you regulate urban agriculture activities?

b) **Survey Questionnaire**

Dear respondents;

The purpose of this questionnaire is to assess the contribution of urban Agriculture towards food security among the urban resident households in Akaki-Kaliti sub-City involved in this sector.

Your accurate answers have great contribution to the outcome of the research. Therefore, you are kindly requested to give genuine responses to the questions below. The answers you give to the questions are going to be used for research purpose only.

Thank you, in Advance!

Part I: <u>Demographic and Socio-Economic Information</u>

*<u>Instruction</u>**:** Answer the following questions by underlining your responses.*

1) Sex: Male Female

2) Age: 15-29 30-49 50-64 above 64

3) Marital status:

a) single b) married c) divorced d) separated e) widow/widower

4) How many children do you have?

a) none b) 1 c) 2 d) 3 e) 4 f) more than 5

5) Level of education:

a) non-formal education b) grade 1-6 c) grade 7-8 d) grade 9-12 e) college/university

6) What is your estimated daily average income?

a) income < 25 birr b) 25>income<50 birr c) 50>income<75 birr d) income>75 birr

Part II: <u>Questions on Urban Agriculture and Food Security</u>

*<u>Instruction</u>**:** Answer the following questions by underlining your responses.*

1. What benefits do you get mostly from your urban agriculture work? (i.e. Only for those poor households engaging in urban agriculture)
   a) employment opportunity
   b) income generation
   c) adequate food
   d) others/specify
2. How many meals did you had in the last 24 hours of the day?
   a) only 1meal
   b) 2 meals
   c) 3 meals
   d) 4 meals
3. Underline those food groups that were in your meal (meals) of the last 24 hours of the day? (i.e. the list of food groups and their respective contents are attached at the end of this questionnaire)
   a) Food Group 1

b) Food Group 2
c) Food Group 3
d) Food Group 4
e) Food Group 5
f) Food Group 6
g) Food Group 7
h) Food Group 8
i) Food Group 9
j) Food Group 10
k) Food Group 11
l) Food Group 12

4. Have you faced any difficulties in meeting your household's food needs in the last 12 months?
   a) never
   b) rarely
   c) sometimes
   d) often
   e) always
5. If yes, for how many months have you faced food shortage?
   a) for about <1 month
   b) for about 1-3 months
   c) for about 4-6 months
   d) for about 7-9 months
   e) for about >10 months

Part III: <u>Food Groups and Contents</u>

N.B. *<u>The data in this table has been prepared only for the data collector reference.</u>*

No.	Food Groups	Contents of a Food Group
1.	Food Group 1	Enjera
2.	Food Group 2	Wheat bread, rice, sorghum, and maize
3.	Food Group 3	Roots and Tuber crops (potato, sugar beet, carrot, beetroot, etc)
4.	Food Group 4	Sugar and sugar products (Jam, Honey, etc)
5.	Food Group 5	Vegetables (cabbage, lettuce, Swiss chard, tomato, etc)
6.	Food Group 6	Fruits (Orange, Mango, Papaya, Banana, etc)
7.	Food Group 7	Beef, mutton, poultry, and pork
8.	Food Group 8	Eggs
9.	Food Group 9	Fish (Fresh and dried)
10.	Food Group 10	Lentils, Beans, Chick peas, and Ground nut
11.	Food Group 11	Milk and milk products (Fresh milk, yoghurt, cheese, etc)
12.	Food Group 12	Oils, fats, any food prepared with butter

Thank you very much for your time!

Appendix II: Performance of Urban Agriculture in Addis Ababa City

Table 16: Urban Agriculture Performance in Addis Ababa

Sub-city	Vegetable production		Horticulture		Dairy products		Cattle Fattening		Bee Keeping		Poultry		Silkworm production		Mushroom production		Floriculture		Livestock & vegetable production	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Addis Ketema	47	55.3	11	12.9	27	31.8	7	8.2	4	4.7	37	43.5	1	1.2	5	5.9	8	9.4	27	31.8
Kolfe-Keranio	40	60.6	**25**	37.9	36	54.5	9	13.6	4	6.1	39	59.1	7	10.6	15	22.7	9	13.6	35	53.0
Gulelle	21	25.6	14	17.1	39	47.6	**21**	25.6	12	14.6	35	42.7	4	4.9	12	14.6	24	29.3	12	14.6
Arada	22	36.1	11	18.0	30	49.2	14	23.0	5	8.2	26	42.6	2	3.3	14	23.0	10	16.4	16	26.2
Bole	45	46.9	8	8.3	34	35.4	10	10.4	3	3.1	27	28.1	5	5.2	11	11.5	27	28.1	23	24.0
Yeka	**55**	64.7	23	27.1	**63**	74.1	11	12.9	16	18.8	56	65.9	0	0.0	6	7.1	24	28.2	**50**	58.8
Lideta	12	17.6	12	17.6	25	36.8	15	22.1	8	11.8	26	38.2	1	1.5	5	7.4	10	14.7	11	16.2
Kirkos	32	31.1	5	4.9	39	37.9	18	17.5	4	3.9	52	50.5	2	1.9	9	8.7	18	17.5	13	12.6
Nifas Silk Lafto	32	32.3	14	14.1	48	48.5	19	19.2	13	13.1	50	50.5	4	4.0	10	10.1	6	6.1	16	16.2
Akaki-Kaliti	52	51.5	18	17.8	45	44.6	38	**37.6**	23	**22.8**	67	**66.3**	9	8.9	35	**34.7**	30	**29.7**	32	31.7
Total	358	42.3	141	16.7	386	45.6	162	19.1	92	10.9	41.5	49.1	35	4.1	122	14.4	166	19.6	235	27.8

Source: Walta Information Center 2014