ADDIS ABABA UNIVERSITY

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THE CONTRIBUTION OF URBAN AGRICULTURE TO WOMEN'S FOOD SECURITY AT THE HOUSEHOLD LEVEL: THE CASE OF AKAKI–KALITI; SUB-CITY, ADDIS ABABA, ETHIOPIA

BY: HILENA AMARE

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BY

HILENA AMARE TADESSE

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ADVISOR: EMEZAT HAILU (PH.D)

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APPROVED BY THE BOARD OF EXAMINERS

_____	_____	_____
Advisor	**Signature**	**Date**
_____	_____	_____
Internal Examiner	**Signature**	**Date**
_____	_____	_____
External Examiner	**Signature**	**Date**

DECELERATION

This research is my original work and has not been presented for a degree or master's in any other university by another person. Also, I acknowledge all the materials I used for this thesis.

Declared by:	**Confirmed by Advisor:**
Name: Hilena Amare Tadesse	Name: ----------
Sign: 	Sign: ----------
Date: 29/06/2023	Date: ----------

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ACRONYMS

EMUDH- Ethiopia Ministry of Urban Development and Housing

FA - Food Security

FGD- Focused Group Discussion

FHH- Female house head

FAO- Food and Agricultural Organization

FSC- Food Consumption score

Govt- Government

GTP- Growth and Transformation plan

HH- Household

MSE - Micro and Small Enterprises

NSPP- National Social Security policy

PAD- Program Appraisal Document

SLF - Sustainable Livelihood Framework

SP - Social Protection

UAECP - Urban Agriculture Extension Core Process

UA - Urban Agriculture

UPSNP- Urban Productive Safety net Program

WB- World Bank

ABSTRACT

Urban agriculture in Addis Ababa city is being implemented by individual households and micro and small enterprises for various reasons. The main objective of this research is to assess the contribution of urban agriculture to the food security of urban women at the HH level. The study was done in two woredas (woreda 1 & 3) in the Akaki-kality sub-city of Addis Ababa, Ethiopia. Both quantitative and qualitative data collection methods were used in the study. In total two Focus Group Discussions were done from the two woredas and a total of 100 households purposively sampled were administered with a semi-structured questionnaire; four key informants were interviewed. The study used the Food Consumption Score to measure household's food consumption, their main sources, and the main food groups consumed. The Finding showed that the income women obtained from urban agriculture contributes to the household's food access through its role in improving their purchasing power and strengthening the coping capacity of women. This implies that the increased income for women due to practicing urban agriculture improves the food security of women at the household level. The result also showed the product women got from UA helps them to increase their food intake and balanced diet. Critical challenges of women participating in UA included: lack of access to adequate agricultural technologies, technical support for training, and agricultural inputs such as better seeds, seedlings, pullets, fertilizer, and pesticides. In addition, more urban agricultural land is needed. Apart from the efforts made by agricultural technical experts to organize UA beneficiaries, there are additional issues, such as institutional instability and improper delivery of the necessary technical assistance at all levels. This research recommended: there should be a focus on microeconomic programs (like improving the living standard) for women and reducing the living cost of society by taking measurements like easy access to credit; access to farming plot land through lease or renting and providing modern UA input by both the Govt and NGO; Extension and training on empowerment and advocacy to raise women's voice in the HH. Providing necessary knowledge, technology, and skills for the production of better urban agriculture production by the women so that the women can be benefited from the UA to alleviate the food insecurity in the HH.

***Keywords**: household food security, women food security, urban agriculture, Addis Ababa city*

CHAPTER ONE

1.1. Introduction

The Current population of Addis Ababa is estimated to be around 5 million, an increase of 4.42% against 2020 (CSA, 2013 E.C).Addis Ababa is a city that comprises the highest proportion of the county's urban population.

Women make up about half of the world's population and are vital to agricultural productivity everywhere (Oladejo et al., 2011). FAO estimates that if women had equal access to productive resources as men, their participation in agricultural activities might boost productivity by up to 30% (RUAF, 2015). It is estimated that women produce 40% of the gross domestic product (GDP) and 50% of developing nations' food (Nuhu et al., 2014).

Food insecurity is a significant challenge experienced by both developed and developing countries. High domestic food prices, unemployment, and low earnings are the primary causes of food insecurity, which further restricts the poor's access to food (FAO, 2009). Food insecurity has historically been perceived as a rural problem; however, rapid urbanization in the contemporary period has shifted food insecurity to include urban areas (Maxwell, 1999). For example, the South African Social Attitude Survey of 2008 found that 20.5% of the urban households and 33.1% of the rural households in South Africa were food insecure (Labadarios et al., 2011). Similarly, the problem of food insecurity in Ethiopia is deep-rooted; according to the Household Income, Consumption and Expenditure Survey report (CSA, 2018), the food poverty line is ETB 1,985 per adult person, and the general poverty line is ETB 3,781. According to the results of this study, 29.6% of the national population and 25.7% of the urban population were living below the poverty line and faced serious difficulty in purchasing adequate food and non-food items for their family members (Enderis, 2022).

Urban agriculture has emerged as one of the most important activities of city dwellers in alleviating poverty and improving household food security and nutrition. This could be due to a lack of cash and meaningful income in urban areas, which can directly translate into a lack of food. (Adekunle, 2013).

Scholars have written articles on Urban Agriculture (UA), defined as "plant cultivation and animal husbandry for food and other purposes within and around cities and towns, as well as related activities such as the production and delivery of inputs, as well as the processing and marketing of products" (De Zeeuw et al., 2011). As a result, urban agriculture is transforming peoples' eating habits in cities.

Urban Agriculture can be practiced in gardens, rooftops, empty public land, cellars, or felid plots with the aid of city dwellers from diverse backgrounds and has a variation in scale ranging from subsistence and micro-scale to large business productions, and this has an enormous contribution to food for the urban regions(*The World Bank Annual Report 2013*, 2013). It uses resources, products, and services of the city area and provides the same. It is viable for efficient urban land use, poverty alleviation, economic development, and environmental management as long as it is mainstreamed into urban livelihood policy strategies (Maxwell, 1999; Mougeut 2000 as cited in Tewodros, 2007).In consideration of urban agriculture as the livelihood option as well as to secure food and nutrition of the urban community; the Ethiopian government produces Urban Food Security Strategy (UFSS) which include urban agriculture one of the ways to secure the food and nutrition of the mass urban poorest of poor in 2015.In this research, the researcher attempted to understand the contribution of urban agriculture to the food security of women who are socioeconomically disadvantaged due to gender inequality in the Akaki Kaliti sub-city

1.2. Statement of the problem

The rapid growth of cities in the world, and Africa in particular, and associated concerns about rising levels of urban poverty and looming food shortages, have positioned the issue of food production within cities as a key theme on the international development agenda(FAO, 2009).

In Ethiopia, the urban poor have diverse challenges and problems: Lack of livelihood diversification, continuous migration from rural to urban areas, and fast population growth in the urban areas. These challenges put a significant burden on the urban community, especially women and children.

Recent empirical evidence indicates that due to high inflation, unemployment, and food insecurity, the urban population has been resorting to various means as a coping mechanism(Yonas et al.,

2013). Urban Agriculture (UA) has been one of the means for coping against a considerable price increase, lower wages, and food insecurity experienced in the country.

Several studies have been conducted to show the contribution of urban agriculture to food and nutrition security. These studies showed UA's contribution to the livelihood and food security of households. According to a study held by (Henok, 2004) in Addis Ababa revealed; urban farming was found to contribute significantly (70-75%) to the livelihood of urban farmers at the household level, income, and food security. However, they were not assessing the contribution of urban agriculture to urban women in the household in particular.

Some research has been done regarding women's food insecurity at the HH level, such as the research (Rabel, 2011) which is conducted in Addis Ababa on "the food security status of urban Female-Headed Households (FHHs) and their coping strategies". The outcome of the study indicates that most of the FHHs relied on informal work for their livelihood. Concerning their food security status, most of them are food insecure. In the same way, this research assessed only female-headed HH food security status. Moreover, (Haregewoin Cherinet & Emebet Mulugeta, 2013) , states that women are producers, preservers, and processors of food but they are found to be ill-equipped and underfed. As per her study, neglect of women in the agriculture, education, and health sectors has continued to be one of the fundamental causes of food insecurity. She also argues that women's increased risk of vulnerability to food insecurity is caused by poverty arising from the fact of their low status in the community.

Underscoring the vicious circle of poverty, famine, and social and economic exclusion, it is critical to link this attribution to food insecurity in Ethiopian FHHs. Aside from that, it is essential to note that majority of these FHHs are found in urban areas. The distribution across regions reveals that Addis Ababa has the highest proportion of FHHs, at 39.7%. (Obasohan, 2020). This distribution demonstrates the city's widespread food insecurity.

According to (Girma et al., 2021), the poorest of the poor, who are also found in urban areas, are the most likely to be found at a high risk of food insecurity. He also stated that single-parent households with dependent children are among the most vulnerable. The situation will be particularly dire for female-headed households (FHHs). Numerous literatures show a strong correlation between female headship, poverty, and food insecurity (Chant, 1997).

Therefore, this research attempted to examine the contribution of Urban Agriculture to the food security of urban women at the house hold level who are engaged in urban agriculture in Addis Ababa Akaki- Kality Sub-city.

1.3. Research Objectives

1.3.1. General Objectives

This research aims to assess the contribution of urban agriculture to the food security of urban women at the HH level.

1.3.2. Specific objective

1. To identify the types of urban agricultural practices and activities in the study area;
2. To examine the contribution of UA to the food security of urban women;
3. To examine the challenges and opportunities of women engaged in urban agriculture in the study area.

1.4. Main Research Question

What are urban agriculture's contributions to urban women's food security in the study area?

1.5. Sub-Research Questions

1. What are urban agricultural activities in the study area?
2. What are the contributions of the UA in the food security of women in the study area?
3. What are the constraints and opportunities of urban agriculture for women?

1.6. Significance of the Study

This research is on the contribution of urban agriculture to women's food Security at the House hold Level. The outcome of the research could make reliable data to inform and guide the process of employment creation and income generation individually or through micro and small enterprises. The findings could help various governmental and non-governmental organizations as a means of intervention in reducing urban poverty and thus promoting local economic development. The study could also contribute to policy and decision-makers by identifying the

major constraints hindering the growth, expansion, and development of the sector. Finally, the study serves as a reference material for further study in this area.

1.7 Scope of the Study

This study focuses on examining the types, constraints, and contributions of urban agriculture to women's food Security in the Akaki- Kaliti sub-city in Addis Ababa. The subjects of the study are only women in the working age group living with their partners.

1.8. Organization of the research

This study paper is organized into five chapters. Chapter one elaborates the background of the study, the research question, the objective, and the significance of the study. Furthermore, in chapter one, the constraints of the study, definition of terms, and organization are presented. The second chapter reviews the literature on the relevant topic; Urban Agriculture and its benefits, Ethiopian's policy and strategy frame work towards food security, and theoretical frame work. In the third chapter, the methodology of the study, the pre-test, sampling techniques, data collection, computational processing and analysis are presented. The fourth chapter concentrated on discussing the findings and results. The fifth chapter deals with the summary, concluding results, and recommendations.

CHAPTER TWO

LITERATURE REVIEW

This study reviewed and described the concepts central to this research: food security and its dimensions; households; urban agriculture; and the contribution of urban agriculture to improving food insecurity in urban women who practice in the UA as a livelihood strategy.

The literature review guides the research to explore new issues which are relevant to the debate on addressing food insecurity of women in Addis Ababa City Administration.

2.1. Concept of Urban Agriculture

Because there is no universal consensus among experts on the precise meaning of Urban Agriculture, it has been characterized in a variety of ways. Arku et al. (2012): 2. However, they all revolve around a few key ideas, which can be characterized as determining the sort of activity and the motive for the practice. The first of these conceptions is about the practice's location: urban agriculture is done on the fringes of cities (Mireri et al., 2006: 3 cited in Ahmed, 2020). Tewodros (2007: 6) adds to this by adding that it is primarily done in public open space within or on the outskirts of cities. According to Game and Primus (2015: 1), urban agriculture is an activity located near populous places, which can be small or big areas within or around cities. The character of agricultural activities is another idea linked with defining urban agriculture practice. Mireri et al. (2006: cited in Ahmed) define urban agriculture as crop or livestock production, as well as agroforestry or fuel wood production. These authors also believe that diverse elements such as culture, tradition, markets, water and rainfall availability, climate of the location, soil condition, and level of exposure to the sun influence the decision of what is produced. Game and Primus (2015:1) define urban agriculture as an activity focused with food and other items gained primarily through plant cultivation and rarely through livestock raising. Concerning the third notion, the motivation for engaging in urban agriculture activities, Arku et al. (2012: 3) note that it might range from home consumption to being sold at urban markets and export markets for pure profit generation. Again, the objective can range from meeting the dietary needs of the household to generating cash or even serving as a recreational pastime (Ibid).

Therefore, urban agriculture is the practice of agriculture in urban areas. The production, processing, and distribution of a variety of commodities, such as vegetables and animal products is conducted within (intra-urban) or on the outskirts of urban areas (peri-urban). Its primary motivation is to produce food for personal consumption or to make money through sales. This definition focuses solely on the where, what, and why questions and it seeks to distinguish between rural and urban agriculture, as well as agricultural activities done for leisure. (Maugeot, 2000).

2.2. The Benefits Urban Agriculture

According to Eshete (2018), UA demonstrates that it may significantly contribute to securing and/or augmenting the food needs of urban residents, especially in Addis Ababa; Some of the benefits of UA in Addis Ababa are that it: offers a source of income, improves nutrition, supplies energy, reduces food expenses, serves as a coping mechanism in difficult times, and helps maintain the ecosystem of the city. All of these advantages are briefly mentioned below.

Means of Livelihood

By providing formal employment, the sector continues to provide a source of income for many Addis Ababa households. Within the city of Addis Ababa, more than 50,000 people work in agriculture (Eshete, 2018).

Enhance Nutrition

The production of fresh vegetables, cereals, dairy products... etc. within the city enhances nutrition at the household level. The 11 vegetable cooperatives within the city cover up to 7.13% of the city's overall vegetable demand, and small-scale dairy farms cover up to 80% of the city's milk supply (Eshete, 2018).

Source of Energy Supply

Woodlands/biomass around Addis Ababa is a source of energy (as fuel wood) to the majority of households within the city, supplying upto10% of the total energy demand of the city, which is 2.4 million cubic meters (Eshete, 2018).

Saving on Food Costs

Poor people in developing countries generally spend a substantial part of their income (50-70%) on food (RUAF), thus growing/producing one's food provides saving on food purchases.

Households involved in vegetable production in their backyard revealed that 75% of their vegetable produce is consumed in-house. This is saving them the amount of money they would otherwise have spent on the market (Eshete, 2018).

2.3. Challenges of Urban Agriculture in Ethiopia

Despite its potential for sustainable city development, there are several weak points concerning UA. To start with, UA is not as new as it seems (Steel, 2008; McClintock, 201). Agriculture was formerly a prevalent practice in cities throughout industrialized countries. In 1890, for example, agriculture occupied one-sixth of the total surface area of Paris, yielding over 1,000,000 tonnes of vegetables each year (Steel, 2008; McClintock, 201). Similarly, advanced cultivation techniques and closed loop systems are already widely utilized in 'regular' agriculture, such as in the greenhouse of the West land area's high-tech horticulture cluster in the peri-urban zone between the Dutch cities of Rotterdam and The Hague. Furthermore, it may be argued that UA is not as nutritious and fresh as anticipated. Thomaier et al. (2015) even stated that there are health hazards associated with 'urban veggies' that may contain high amounts of heavy metals due to (air) pollution in cities. Similarly, it has been claimed that modern soilless growing technologies result in 'manufactured food' deficient in natural nutrients. UA may also lead to links with other urban functions, such as dwelling and working. In cities, there may be a dearth of sufficient and acceptable land for agricultural operations, and whenever space is available, UA may cause negative externalities, such as air pollution(e.g. odoodorom livestock), over charging the city's energy grid(Thomaier et al, 2015). Environmentalists may also demonstrate against urban agricultural, particularly (animal) husbandry. For example, in Rotterdam, environmentalists have (unsuccessfully) objected against a pilot project including pig farming in rooftop gardens, which is said to be detrimental to pig welfare (AD,2015). Furthermore, as mentioned previously, UA may be hampered by legal limits and governance connections. Zoning policies and certification influence aspects of UA such as siting, manufacturing, infrastructure, marketing, and input access (Pfeier et al, 2015).In General, Certification is seen as an important constraint for farming in cities which explains why many urban farmers focus on the social dimension of UA rather than producing for the market (Thomaier et al, 2015).

Finally, UA necessitates significant investments to cover high operational costs such as infrastructure, energy, and administration (Van de Valk, 2012). As a result, it may be difficult for new urban farmers to create an adequate income (Dimitri et al., 2016). Vertical farming, in particular, has high energy costs, making it difficult to compete with traditional outdoor farming in warmer climes. Technology, on the other hand, has advanced swiftly. Philips, for example, has proved that new LEDs achieve 68 percent efficiency compared to standard LEDs, which achieve around 28 percent efficiency. This might significantly reduce lighting expenses (Van de Valk, 2012).All in all, the success of UA is far from guaranteed. There are limitations to the concept creating challenges for cities that intend to invest in it. UA is hindered by a variety of Economic, spatial, functional, organizational, and institutional challenges. These challenges might be hard to overcome, especially when cities strive for an integrated approach to UA.

Similarly, different studies have identified challenges faced by people practicing urban agriculture in Addis Ababa. Kebede has identified some key challenges for those involved in UA in Ethiopia (Kebede, 2020). His main findings are presented below.

Tenure Insecurity:

Urban farmer's most common concern is the fear of losing the land they cultivate at any moment without warning or notice. According to the constitution of the Federal Democratic Republic of Ethiopia, land is a public good, and it can be taken away by the state or the municipality for residential or other urban uses (Kebede, 2020).

High Prices for Inputs:

The increasingly high cost of improved seeds and fertilizers is a critical challenge for experienced farmers. Rural farmers have access to government-subsidized inputs, but urban farmers do not (Kebede, 2020).

Shortage and Contaminations of Irrigation Water

The quality of irrigation water, particularly during the dry season, is also a major concern. Wastewater and chemicals dumped or leeched from nearby industrial sites pollute the rivers and streams used for irrigating the fields (Kebbede, 2020).

Lack of Good Quality Farm Equipment

Farmers complain that Chinese-made farm tools are not sharp enough and break quickly. They yearn for the reliable Asmara-made tools they were accustomed to working with before the 1997-98 war with neighboring Eritrea.

Crop Losses from Pests/Diseases

Farmers also complain about crop losses caused by diseases. The most common pest was nematode which attacks cabbage, cauliflower, and kale. The pest causes the root system to swell and eventually die. There is no known remedy to this problem, but farmers have tried different measures to minimize the incidence of the pest.

Pollution

Because untreated effluents discharged from industries pollute the Little Akaki River, there are some health concerns related to consumption of vegetables grown using the Akaki River water. The farmers are worried that they might lose their source of livelihood if the public stops purchasing their produce due to health concerns.

Night-Time Theft

This is a problem for 1 out of 5 farmers. Roadside farms (such as those by the city's slaughterhouse) are especially susceptible to theft. Farms located far from the homestead are also prone to theft.

2.4. Food Security

The most influential and widely accepted definition of food security is the one of the Food and Agriculture Organization of the United Nations: "access by all people at all times to enough food for an active and healthy life" (FAO, 1999a). This definition encompasses many issues, but above all the following key components.

Availability is achieved when safe and nutritious as well as sufficient quantities of food are consistently available to all individuals within a country (Gardening et al, 2011).

Accesses are ensured when all persons within a household have adequate resources to obtain appropriate foods for a nutritious diet (Gardening et al, 2011).

Utilization refers to how the members of the households make use of the micro-nutrients that exist in their diets. It also involves food preparation and prevailing sanitary conditions, health care, and potable water (Frankenberg, 1998).

Stability or sustainability refers to the temporal dimension of nutrition security, i.e., the timeframe over which food security is being considered. In much of the food security literature, a distinction is made between chronic food insecurity – the inability to meet food needs on an ongoing basis – and transitory food insecurity, when the inability to meet food needs is of a temporary nature (Frankenberg, 1998).

For this study, the researcher used food accessibility and availability to assess the food security of women at the HH level.

2.5. Livelihood strategies

How people combine and use assets in pursuit of beneficial livelihood outcomes that meet their livelihood objectives is also influenced by this environment. The viability and effectiveness of livelihood strategies are dependent upon the availability and accessibility of assets, services, and opportunities which can be positively enhanced or adversely undermined by ecological factors, social structures, or institutional processes (Majale 2002).

2.6 .Ethiopia polices and strategy framework toward food security

2.6.1. Growth Transformation Plan II (GTP II)

The GTP II stipulates that reducing food insecurity and urban poverty and ensuring sustained job creation in urban areas is a top priority. Several policies, strategies, initiatives, and programs are designed to address the aforementioned urban challenges, and hence the UPSNP is complementary to these Government strategies and programs (Adank et al., 2016).

2.6.2. National Social Protection Policy (NSPP)

In November 2014, the Ethiopian Council of Ministers approved a National Social Protection Policy (NSPP) prepared by the Ministry of Labor and Social Affairs (MoLSA). The Social Protection Policy has a broad objective of providing overall Social Protection (SP). The Social Protection Systems create an enabling environment in which Ethiopian citizens have equitable access to SP services that will enhance inclusive growth and development (Ozlu, 2015). Overall, the policy commits the government to move beyond the partial and fragmented provision of SP to establish a comprehensive SP system. The policy puts a strong emphasis on the need to expand social safety nets and livelihood interventions in rural areas and to initiate the same as in urban areas in a more effectively targeted and coordinated manner (Cochrane et al, 2016).

2.6.3. Urban Food Security and Job Creation Strategy

The NSPP provides the framework for the coordinating and services in Ethiopia. It defines the roles and responsibilities of the government at federal, regional, and local levels to manage the SP system to fulfill the constitutional rights of citizens. Urban Food Security and Job Creation Strategy: Within the framework of the NSPP, the Ministry of Urban Development and Housing (MUDHo) has developed an Urban Food Security and Job Creation Strategy, which was approved by the government on May 8, 2015 (Ozlu, 2015).

The strategy aims to reduce poverty and vulnerability among the urban poor living below the poverty line over a period of 10 years. The proposed Urban Productive Safety Project is the first instrument of the government to implement this strategy (Cochrane et al, 2016).

2.6.4 The National Nutrition Program (NNP)

This is the principal document of the government that guides nutrition-specific and nutrition-sensitive interventions. Nutrition-specific interventions are mainly coordinated by the Ministry of Health. Nutrition-sensitive interventions are multi-sectoral, including agriculture, social sectors, trade, and industry Social safety nets are proven methods of ensuring the poor and most vulnerable get access to nutrition education and improve their dietary diversity.

The rapid growth of the urban population and the low nutrition level of the urban poor, and the rising cost of food have raised the importance of looking at the potential of urban agriculture. In

many developing as well as developed countries, urban agriculture has come to be seen as one of the strategies to address the urban food security challenge; this is because urban agriculture can provide a substantial contribution to food security and enhance the nutritional level of the urban poor (Martellozzo,2014).

Urban agriculture improves food security in communities and can assist individuals who are living with food insecurity. Growing food in urban or peri-urban areas is a strategic way of addressing poverty and its related issues by reducing hunger, improving access to fresh, healthy, wholesome foods, enhancing nutrition, and raising the quality of environmental conditions that affect health(Stock & Watson, 2018). Urban agriculture fosters an understanding of agriculture for urban citizens who often do not otherwise see a direct connection to where food comes from, thus encouraging a better understanding and appreciation of healthy eating from farm to fork (Brown, 2016).

Regarding food supply, urban farming benefits the household directly through self-consumption (household level). This concerns both the quantity and the quality of the consumed food. When part of the produce is sold, others in town benefit as well, mainly when the product is sold below the market price at town level (Foeken et al, 2004). Often a tiny part of the produce is given away to neighbors or relatives (neighborhood level). Income generation at the household level can be direct, i.e. when (part of) the product is sold, and indirectly, i.e. through saving on food costs ('fungible income'). At the town level, many people can benefit directly from farming activities. For example, through undertaking paid labor at urban farms, selling inputs, transporting, buying, and selling produce. These people may pay taxes and market fees, thereby benefiting the municipality as well. Employment creation at the household level concerns the labor carried out by the members of the household (Foeken et al, 2004).

2.7. Theoretical frame work

This research will attempt to uncover the contribution of UA to women's food security at the HH level, which will see indirectly the relationship of the husband and wife at the HH level in accessing, controlling, and decisions making on the income and UA products at the HH level which directly or indirectly affect women's food security.

To Support the above research purpose, the researcher will use “socialist feminism” theory due to the reason Socialist feminism focuses on both the public and private spheres of women's life and contends that liberation can be attained only by working to eliminate both the economic and cultural sources of women's oppression. It is also a two-pronged theory that broadens Marxist feminist’s argument for capitalism’s role in women's oppression and radical feminism's theory of gender and patriarchy. Furthermore, in the new order, one of the visions of socialist feminism is democratic councils through which all people control the decisions that most directly affect their lives on the job, at home, and in the community(Abbott & Booth, 2014).

2.8. Empirical Literature on food security in Relation to Agriculture

2.8.1. Global urban agriculture and food security

Urban agriculture is not a recent phenomenon in the world Archaeological findings are unraveling the agricultural practices of urban settlements achieved by ancient civilizations for the production of food, feed, fodder, firewood, building materials, windbreak, medical plants, and transportation (Tinker 1994, Falve 1999, Teferee 2003) To meet part of the food needs of urban dwellers, urban farming both in intra-urban and peri-urban areas, is a familiar and almost permanent feature in the developing world. Spatially juxtaposed with other urban activities and resources, urban farming makes a vital contribution to the household economy of the urban residents (Falve 1999, Tinker 1994). It is supplying food to over 800 million urban dwellers worldwide. It is the source of food for 40 percent of African and 50 percent of Latin American urban dwellers (UNDP 1996, Zezza and Tasciotti 2008). Today, even within and around large metropolitan areas like Beijing, urban farming not only provides residents with safer and healthier food but also keeps farmers in business. Urban agriculture has also been practiced in the cities of developed countries. For example, in Vancouver, Canada, 44% of the inhabitants grow vegetables, fruits, nuts, or herbs in their yards, on their balconies, or in community gardens.

Nowadays, cities worldwide produce about one-third of the food their residents consume on average. Hence, urban farming is neither a new nor a declining activity in towns, and it remains the cornerstone of many urban economies (Tacio, 2007).

Furthermore, urban agriculture has become one of the fastest-emerging trends, especially in the developing world, where urban agriculture grows at 3.5% annually (Gamhewage et al., 2015). It

is estimated that as many as 40% of the urban population in Africa is involved in urban agriculture (Foeken et al., 2004). On the other hand, urban agriculture can be practiced for a variety of reasons. A study by Maxwell (1994) in Kampala, Uganda indicated that there were at least two significant categories of logic by households to be engaged in urban agriculture.

These included commercial production and household food self-sufficiency. It is also valuable for urban greening, waste recycling, and microclimatic conditioning. Urban agriculture is therefore, contributing a significant amount to reducing the problems of urban household food insecurity by improving access to fresh and low-priced food and raising the nutritional status of the residents.

2.8.2. Ethiopia urban agriculture and food security

Back in 1996, Ethiopia designed and started the implementation of a food security strategy (Eneyew, 2010). The program aimed to improve the food security of the vulnerable population of 15 million people. These were the most food insecure people, of which 5 million are chronically food insecure, and the other 10 million are more susceptible to shocks and experience temporary or severe food insecurity during droughts. (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 was 1985 birr in 2010/2011.

According to MoFED, 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 cause food insecurity in Ethiopia (Eneyew, 2010). 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, and 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). Since the 1970s, urban agriculture has been growing in the developing world as a result of rapid urbanization, crippled domestic food distribution systems, wage cuts, soaring inflation, rising unemployment, declining purchasing power, limited urban land use regulations, civil strife and natural disasters in urban areas.

According to CSA (2021), 30% of urban residents in Ethiopia participate in urban agriculture activities, of which 13% are women. Over the past decade, the recognition of the fact that a large

part of urban farmers consists of women has increased, the part of the urban farmers consists of women have increased (RUAF, 2015). In several urban areas in developing countries, including Ethiopia, UA is taken as one of the strategies to address the increasing urban unemployment, poverty, and hunger (Bellows, Brown, Smit, 2003). The same could have been true in Addis Ababa and the surrounding towns such as Bishoftu, Holota, Legetafo, Sebeta, and Sululta. This is because UA enhances food and nutrition security, provides employment, and generates income for the urban poor in general and the disadvantaged groups such as women, people with disability, the elderly, and unemployed youth in particular, The frequent field-based observations aiming at obtaining firsthand data for this research indicate that the entire need for vegetable and dairy products of the residents of Addis Ababa in the small towns nearby the city can be met by the UA within the boundaries of these urban areas. This can be achieved by producing once/twice a year on a small plot of land through efficient use of scarce sources such as water and land.

2.8.3. Women, Urban Agriculture and Food Security

According to FAO (2010), women contributed 60-80% of all agricultural output in Benin, 48% in Burkina Faso, 80% in Congo, and 30% in Sudan. Women also contribute more to food production in Asia and Latin America. Almaz (2000) stated that rural women perform 20-40% of agricultural labor in Ethiopia, Journal of Culture, Society, and Development. It is also estimated that approximately 79% of rural women in Ethiopia work 13-17 hours each day, nearly twice as many as males. Various case studies on gender analysis of small-scale farms in various parts of Africa show that crop and animal production are key sources of income. Off-farm activities, part-time jobs, pensions, and remittances are some of the ways to support the farm family. According to the references, women have a heavier workload and lesser productivity. According to Kalinda et al. (2000), male-headed households in Choma, Zambia's Southern District, own larger farms with more cattle and ox plows. The adoption of technological packages is linked to wealth (livestock), notably cattle in rural families. Rural women in Ethiopia are a tremendously productive resource in the agriculture industry. They are significant contributors to the agricultural workforce, either as family members or as women heads of families. There have been recent policy measures to increase women's positions in agriculture. The Plan for Accelerated and Sustained Development to End Poverty, 2005/06 to 2009/10 (PASDEP) was launched in 2005 to protect women's rights to

land, credit, and other productive resources, as well as to protect women from other deprivations such as longer working hours, violence, and discrimination (IPMS & ILRI, 2010). Nonetheless, despite these recent initiatives, a combination of economic restrictions, cultural norms, and practices continue to limit women's participation to household food security and, to a lesser extent, inhibit agricultural commercialization. Gender roles and relationships influence the division of labor, the use of resources, and the distribution of production advantages between men and women. In example, the adoption of new technologies and practices, backed up by enhanced service delivery, frequently ignores the gendered ramifications of market-oriented growth, with many advantages bypassing women (IPMS, ILRI, 2010).

2.9. Food Consumption Score

The frequency-weighted diet score or 'Food Consumption Score' is a proxy indicator for measuring food consumption and is calculated using the frequency of consumption of different food groups consumed by a household over a seven-day period before the survey (WFP, 2008). The FCS also records the main source of the food (for example, purchase, barter, or own production. Annex 1 presents the FCS data collection sheets. To calculate the FCS the Calculation steps had to be done:

I. Using standard VAM 7-day food frequency data, group all the food items into specific food groups.
II. Sum all the consumption frequencies of food items of the same group, and recod the value of each group above seven as seven.
III. Multiply each value obtained for each food group by its weight and create new weighed food group scores.
IV. Add the weighed food group scores, thus creating the food consumption score (FCS).
V. Using the appropriate thresholds to recode the variable food consumption score, from a continuous variable to a categorical variable.

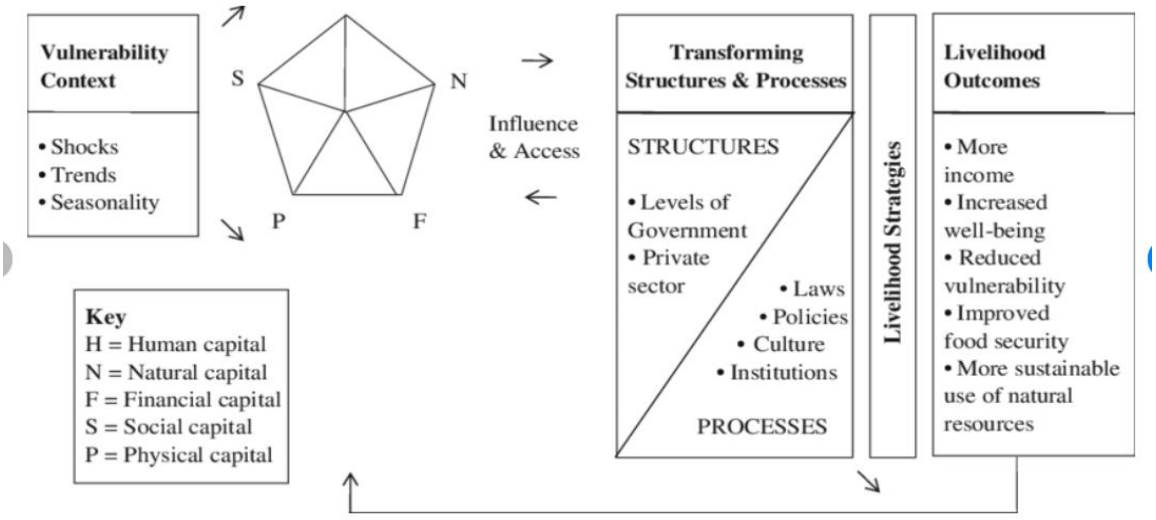
2.10. Gender Role in Ethiopia

Ethiopia women have played the traditional role of motherhood and home maker in both rural and urban areas. However, their work has never been limited to the household and the family. Ethiopian women are actively involved in all aspects of their social life. Women are both producers and procreators and they are active participants in the social and cultural activities of the community.

However, the important roles they play have not always been recognized. Without, equal opportunities, they have lagged behind men in all fields of self-advancement. Economic development is unthinkable without women participation; however, because their participation in the economy has not been valued, Ethiopian women have not received even their share of the nation wealth. Woman's productivity is predominated in the processing and marketing of food in rearing, and food processing and industries (Melese, 2011).

Gender division of labor among farming community of Ethiopia has also been common. Ethiopia is a country where more than 85% of its population depend on rain fed agriculture. Agriculture is the backbone of the national economy. Both men and women have been playing a significant role in the development of agricultural production. The role and the contribution of both male and female, in agricultural activities, is not necessarily the same in all parts of the country. Since Ethiopia is the country of multi-ethnic and multi-cultural groups, all ethnic and cultural groups have different gender roles in agriculture.

2.11. Conceptual Frame work



Sustainable livelihoods framework (from DFID 1999)

The SLF provides an overview on the main factors that affect people's livelihoods, and typical relationships between these and provides insights into important issues, their influences, and processes with emphasis on the interactions of the various factors that affect livelihoods.

I. Vulnerability Context: It refers to the external environment in which the people live and have little or no control over and it has an impact on their assets and what options they have in pursuit of their livelihoods. These include shocks, trends, and seasonality (Dfid, 1999).

II. Livelihood Assets: This represents the five core asset categories which include, Human, Social, Natural, Physical and Financial Assets upon which livelihoods are built around (Dfid, 1999.)

III. Transforming Structures and Processes: These are the institutions, organizations, policies, and legislation that exist within the environment to shape livelihoods (Dfid, 1999).

IV. Livelihood strategies: This denotes the combination of activities and choices that people make/undertake to achieve their livelihood goals (Dfid, 1999).

V. Livelihood Outcomes: This represents the results or output of the livelihood strategies. (Dfid, 1999). The SLF is very important to this study because, I sought to understand what outcomes the people derive from their livelihood strategies, i.e. being engaging in UA and this couldn't be done in isolation but in the context where I can understand their vulnerabilities and what structures exist within their environment to help or impede their efforts at reducing their vulnerabilities and building productive assets. The SLF was used to answer my sub-research question with a particular focus on the livelihood outcomes (food security) by using the Food Consumption Score and FGD with the two woredas selected respondents. The study looks at two woredas that is woreda 1 and 3 to study the contribution of UA in the food security of women in the HH level.

CHAPTER THREE

METHODOLOGY

The main objective of this research was to evaluate urban agriculture's contributions to urban women's food security in the study area. Data were collected using a survey questionnaire, FGD, interview methods, and direct observation. This chapter explains the methods that were employed to address the research questions and the study to meet the research objectives. Furthermore, it presents inclusion and exclusion criteria, study variables, sample size determination, sampling techniques, data collection, and analysis techniques, and ethical considerations.

3.1. Description of the Study Area

3.1.1. Geographic Location

This study was conducted on those selected households of the Akaki-Kaliti Sub-city of Addis Ababa. Among those 8 Woredas, prominent for urban agriculture in the sub-city, this study is confined to 2 of them where urban agriculture is one of the significant sources of income or means of living of inhabitants. The two Woredas were purposely selected for their significant number of urban farmers found in the area that can represent the population in the sub-city.

Akak-iKaliti is located in the southeast part of Addis Ababa shares a boundary with Bole and Nefas Silk Lafto Sub cities in the southwest and southeast directions, respectively, and the rest with the Addis Ababa Zuria, Special Z`ne of Oromiya Region (A. A city Administration, 2019).

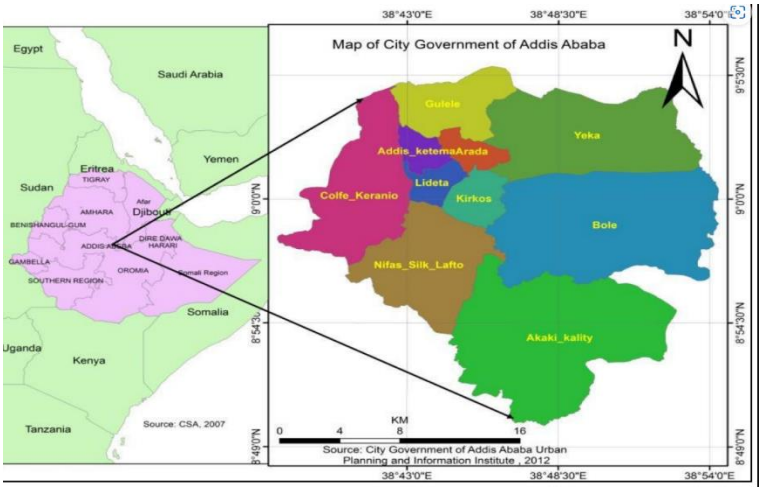


Figure1. Source Google map: Study area (Addis Ababa Map)

3.1.2. Administrative Structures, Population, and Urban Agricultural Activities

The current Addis Ababa total population is estimated at around 5 million, a 4.42% increase from 2020 (CSA, 2021). Administratively the city is subdivided into 11 sub-cities, and the sub-cities are subsequently subdivided into a total of 116 Woredas, the smallest administrative structure in the city. The AkakiKaliti sub-city is populated with a total of 255, 348 inhabitants, of whom 51 percent are females which are estimated from CSA, 2007 (CSA, 2007). The sub-city is composed of 11 Woredas, where urban agriculture is widely practiced in all Woredas except those three Woredas located in the northeast, east, and southern fringes. These three woredas, called Woreda 09, 10 and 11. In these areas, peri-urban and rural agriculture are predominantly practiced (Unpublished source: AkakiKaliti Sub City UAESP).

As per the information obtained from the Urban Agriculture Extension Core Process(UAECP) and Micro and Small Enterprises (MSE) offices of the sub-city, two Woredas, Woreda 01and 03, have been selected where the four sub-systems of urban agriculture such as poultry, dairy, livestock fattening, and vegetable production are widely implemented by urban dwellers.

3.2 Research Approach

The purpose of this study is to assess urban agriculture's contributions to urban women's food security in the study area. The study has used both quantitative and qualitative research methods.

3.3. Research Strategy and Data Collection

3.3.1. Research Strategy

In this research, the researcher combined quantitative and qualitative methodology. It is more desirable to combine quantitative and qualitative methodologies (a mixed approach) because qualitative data offers explanations, meanings, and relatively new ideas, whereas quantitative data offers accurate summaries and comparisons.

Quantitative research methods are used for the “Food Consumption Score” to measure household food consumption of urban women who are engaged in urban agriculture.

The qualitative data collection method is used to identify the challenges and opportunities connected with urban agriculture and its contribution to improving the food security of urban women who are practicing urban agriculture as their livelihood. This method is applied by using key informant Interviews and Focus group discussions.

3.3.2 Primary and Secondary Data Collection.

I. **Primary Source:**

Primary Data was gathered through Focused Group Discussion, Interviews, and Household Surveys. The Food Consumption Score is a proxy indicator to measure food consumption and is a choice of instrument for amongst others, the World Food Program and the Integrated Food Security Classification. The FCS collects information on the consumption of several food groups over seven days, including the primary source of the foods consumed (e.g., local purchase, barter, own production). The score addresses the contribution of UA to the food security of urban women at the HH level.

The target populations of this research are women who are participating in UA as a livelihood to assess the contribution of UA women's food security at the HH level.

II. Secondary Source:

Secondary data collection was used by examining published works and official records connected to meetings, yearly reports, and journals that have been documented. Additional sources of published studies and data were collected from the internet and the library's intranet at Addis Ababa University.

3.3.3 Method of Data Collection

The research was based on the analysis of both qualitative and quantitative data collected using the following instruments for generating the information that could address the purpose of the study.

Survey Questionnaire: To collect relevant data from the selected samples, a questionnaire was both open and closed-ended been used. The questionnaire was prepared in the English language; however, it is translated into the local language to make the questions simple, clear, and understandable to respondents. The pilot test (pre-test) had conducted before the Survey. During the pilot test a question 20 households were selected randomly by were selected by using random sampling a technique. Those respondents who had been selected for the pilot test were not included later in the execution of the actual survey. In general, the pilot test has helped the researcher to see whether there are any difficulties with the questionnaire and to modify based on the feedback of the pre-test or to check the reliability and validity of the data that the researcher collected.

Key Informant Interview (KII): The KIIs were drawn from the administrative head of woreda and urban agriculture extension experts. Therefore, the four key informants drawn from the above-mentioned organizations and offices were contacted, and the interview was held separately.

Focused Group Discussion (FGD): In this study, the researcher held two focus group discussions with selected women to gather more information. The FGD featured seven women who were selected from each woreda. The FGD participants were drawn from five different types of activities: dairy farming, fattening, crop production, vegetable farming, and poultry farming. The researcher facilitated and led the FGD. To that end, the researcher used a checklist to guide the discussion during the data collection process.

Direct observations: The respondent's replies with the reality on the ground, the researcher personally observed all of the UA practice locations of the two Woredas.

3.4. Sample Size Determination and Sampling Procedures

The study was conducted in selected Woredas of the Akaki-kaliti. The challenges of the researcher was how to decide how much should be the number of samples to be selected from a population of the study area. The large size of the sample is advantageous in terms of the accuracy of the study; however, sample size depends on several considerations, of which the homogeneity of the population, resources allocated for the study, and the precision required are the most important ones (Asharma,2005). Additionally, this specific site was selected as a study area given the fact that the performance of urban agriculture in the sub-City is relatively high. Akaki-Kaliti practices UA in larger areas than the other sub-cities and ranks first in performance among Addis Abeba's ten sub-cities. (Urban agricultural office, 2021).

The target population of the study is based on the information obtained from the Akaki-Kaliti sub-City Urban Agriculture Office of woreda 1 and woreda 3.A total number of 626 women practice urban farming in these two woredas.

The required number of population to be sampled was calculated using the formula given by Arsham (2005).

N = 0.25 / SE2, Where N = sample size, S = standard error, 5%.

Where N is the sample size,

SE is the Standard Error or desired margin error

According to the above formula, the sample size for conducting the household survey among the total population of 626 HHs has to be 100. Proportional and equivalent sample sizes were selected for two Woredas because the study aimed to understand the modes of farming at various locations of the city, contributions of farming to the food security of urban women farmers and adaptations of the women farmers to various farming-based activities across locations. Hence, it was assumed that the sampling technique provides a good representative sample of urban women farmer households for the sub-city.

To avoid bias in sample selection or lower statistical error, the systematic random sampling approach was used to choose samples from the population. By separating the list of MSEs and urban agriculture beneficiaries, the sampling technique was carried out in each of the Woredas. As a result, the population was separated into two strata, sometimes known as Woredas or sub populations. Using a systematic random sampling process, each stratum's individual HHs were then chosen. The sampling interval was calculated as the difference between the sample size of 100 and the entire population of 626 from the list of woreda's urban women farmers; which was about equal to 7; as a result, a lottery was used to select the first sample from among the lists from 1 to 7 in each Woreda (Singh, 2007). Based on that, the following sample was chosen by multiplying by 7 decimal places, then finding the following sample by using the range of 7 again, and so on until the end of the entire population.

Regarding the sample size of each Woreda or stratum, the method of proportional allocation was used, under which the sizes of the samples from the different strata were kept proportional to the sizes of the strata. That is, if "Pi" represents the proportion of the population included in stratum "*I*," and "n" represents the total sample size, the number of elements selected from stratum "*I"* is equal to n multiplied by "Pi" or "n" x "Pi " (Kothari, 2004).

Adopting the proportional allocation, we shall get the sample sizes as under for the two mentioned Woredas.

Table 1: Calculation of the determination of sample size in each Woreda

List of Woredas/Strata	Total population	Calculation	Sample size
Woreda 01	444	100(444/626)	71
Woreda 03	182	100 (182/626)	29
Total	**626**		100

3.4. 1 Variable of the Study

The study was taken as an assessment of urban agriculture's contributions to urban women's food security at the House Hold level. 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 women's food security at the household level as the dependent variable (DV).

3.5. Sampling Frame and Study Population

Women in the working group (women aged between 15 and 65 who are engaged in UA) at the household level were selected for inclusion in the survey by systematic random sampling method from the list of women who participated in the UA of the two woreda's. This was based on a sampling frame of house numbers developed from sub-cities or weredas and ketene records. The target population was working age group women (15-65years old), dwelling in Akaki-Kality, Wereda 1, and 3 Addis Ababa, Ethiopia.

3.5.1. Inclusion Criteria

Women in the working age group.
Women are living with their partners.
Women who were willing to participate in the study.

3.5.2. Exclusion Criteria

Women who were not willing to participate in the study. If the woman was seriously ill.

3.5.3. Pre-Test

A questionnaire pre-test was conducted in Woreda 1 of Akakikality Sub-City, which has similar socio-demographic characteristics to the people of the Aakaki-Kalit sub-city. During the pre-test, the items that frequently raise questions were revised and cleared. Both the interviewers and supervisors assessed the clarity, understandability, and completeness of the questionnaire. A pre-test was done with 20 productive-age women.

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 essential features. Since the study was guided by a quantitative and qualitative research methodology, the necessary data was collected, analyzed, and displayed in numerical and narrative form. During this phase, the collected data were checked, organized, and entered into the code sheet. The data sheet was used to clean data sets (separate analyzable data from the rest). Following a computerized data summarization technique (using SPSS version 23), the data were analyzed using appropriate forms of presentation. Descriptive statistics, cross-tabulations, including frequency counts, percentages, and other relevant data analyses presentation forms, were utilized in the study.

3.7. Ethical Consideration

The researcher didn't record the identities of the respondents out of respect for their privacy. The respondents requested permission to participate in the study in order to ensure their independence and the confidentiality of the research. This was done to get them to open up and give more information so the study might benefit from having thorough data from the bottom of their hearts. The government officials and the other respondents were given the assurance that the data obtained was solely for academic purposes.

CHAPTER FOUR

RESULT OF THE STUDY

4.1. Characteristics of the Study Population

The case study was made in woreda1 and woreda3 of the Akaki–KalitiSub-City, Addis Ababa, Ethiopia. The study is conducted using primary data collected by applying structured survey questionnaires and a face-to-face interview. This study's findings are based on information gathered from samples of 100 respondents. In this chapter, the findings of the study are presented using descriptive statistics and results of correlation of the regression model.

4.2. Demographic and Socio-Economic Characteristics

4.2.1 Family Size, Marital Status, and Education Level

Table2.Marital Status, Family Size, Age, Husbands Occupation wand Education Status of the sample households

Characteristics	Frequency	Percent
Marital status		
Married	68	68
Living with their partner but not married	32	32
Total	100	100
Highest level of education		
No school	45	45
Primary school	31	31
Secondary school	11	11
Technical Diploma	10	10
University Degree	3	3
Total		
Family Size	100	100
1-3 members	25	25
4-6 members	37	37
7-8 members	38	38
Total	100	100
Age		
15-24	9	9
25 -54	76	76
55-65	15	15
Total		
Husband Occupation		
Government	32	32
Private company employee	20	20
Daily workers	19	19
Self-employed	15	15
Pensioned	14	14
Total		

Source: Author survey, 2022

As shown in Table1, a total of 100 women of working age were surveyed in the study Their marital status is classified as 68% married, 32% are living with their partners but not married The majority of respondents (45%) did not attend education, followed by 31% with primary education and 11% attended high school. In addition, 10% had completed College with Diplomas and 3% only attended tertiary level education (degree and above).

The research involved women in the age group of 25 to 54 years, accounting for 76% of participants, women between 55 to 65 years of age constituted 15% of the sample, and those in the age range of 15 to 24 years accounted for 9%.

Concerning the occupational status of their husband, 32% are government employees, 20% are private company employees, and the remaining 19%, 15%, and 14% are engaged as daily workers, self-employed, and pensioned, respectively.

The number of family members in the sample households ranges from 1-8. In the majority of the households, 38% are with a family size of 7-8 members, 37% have family members ranging from 4-6, and the rest range from 1-3 family members.

4.2.2. Types of Urban Agriculture Activities

Table 3: Types of urban agricultural Activities

Types of Urban Agriculture	Frequency	Percent
Poultry	12	12.0
Dairy	36	36.0
Fattening	29	29.0
Vegetable	10	10.0
crop production	13	13.0
Total	100	100.0

Source: Own survey, 2022

Table 3 demonstrates the entire sample households which practiced urban agriculture are categorized into five Sub-systems, including poultry production, dairy production, Crop production, livestock fattening, and vegetable production.

Source: Author 2023

4.2.3 Staple food sources

Table 4: Staple food sources categorized in rank

Sources of Food	Food source rank as first, Frequency Percent
own production	29
purchases from shops or market	71
Total	100

Source: own sample survey 2022

Table 4, indicates that own production and purchase from shops or markets are the sources of food for the sample households. In this case, urban agriculture can contribute to the households either

by the supply of food from the farm, i.e., own production, or accessible from the market. Accordingly, own production was chosen by 29% of the respondents as their primary source of food, and 71% of the respondents purchased from shops or markets.

4.2.4 Reason to Start Urban Agriculture

Based on the household survey from woreda 1 and 3; the reason for women engaged in urban agriculture reveals:

- To help their low-income families;
- To assist their low food supply at the household level and
- To use it as a source of employment for the household member.

4.2.5. Women food Consumption Score

The FCS is considered as a proxy indicator of current food security. FCS is a composite score based on dietary frequency, food frequency and relative nutrition importance of different food groups (FAO, 2009).

Dietary diversity is the number of individual foods or food groups consumed over the past seven days. *Food frequency* is the number of days (in the past 7 days) that a specific food item has been consumed by a household. Household food consumption is the consumption pattern (*frequency* * *diversity*) of households over the past seven days. Classified into three categories: poor consumption (FCS = 0 to 21); borderline (FCS = 21.5 to 35); and acceptable consumption (FCS = >35.0). The FCS is a weighted sum of food groups. The score for each food group is calculated by multiplying the number of days the commodity was consumed and its relative weight. (FAO, 2009).Based on the above information this research finds the following results.

Table.5. Food Consumption score of woreda 1 and 3

food consumption groups	Frequency	Percent
Poor	14	14.0
Borderline	32	32.0
more than 35	54	54.0
Total	100	100.0

According to table 05 above, 54% of the target population has scored more than 35 FCS, which is acceptable based on the international standard. The remaining 32% and 14 % are under the group of borderline FCS (21.5-35) and poor FCS (0-21) respectively.

4.2.6. Mean FCS by income group

Table 6: Mean FCS by income group

Income Group		FCS Mean	N	Std. Deviation
1	300-2500	37.3552	29	17.13763
2	2501-4500	37.4792	24	15.49788
3	5000-8000	38.2308	26	13.49832
4	8500-15000	39.0000	12	18.87760
5	>15000	42.7778	9	17.56792
	Total	37.9050	100	15.89608

The mean and standard deviation of the data collected for the household food consumption score to examine the household food consumption shows 37.9 and 15.89, respectively. Based on the data in table 6, it is possible to draw findings of more than1500, is the highest, which is 42.778 when we compare with another income group The mean FCS for the1, 2, 3, and 4 income groups were 37.3552, 37.4792, 38.2308, and 39.00 respectively.

The FGD participants confirm in their words:

"*Before we participated in the UA, incomes earned from other sources mostly did not suffice to compete with the continuous price hikes of basic needs in the city, especially consumer goods and*

services. Urban agriculture has changed our financial situation positively by increasing our income per household; furthermore, it helps us in partially securing our food consumption at the HH level."

Though different research affirms that urban households that are involved in urban farming or gardening have better and more diverse diets and consume more vegetables than non-farming households of the same wealth class and these households are in most cases more food secure than households that are not practicing urban agriculture; In addition to this producing one's own food provides benefits for the urban farmers in monetary saving and in freeing up cash for other household expenses, such as water, medicines, rent, schooling and clothing (Andenet, 2015) .

4.3. Decision-making and the use of urban agriculture

Table 7 Decision-making and the use of urban agriculture

Who decides on the UA product		Frequency	Percent
	my self	35	35.0
	both of us	65	65.0
	Total	100	100.0
Use of UA product	both for sale and household consumption	99	99.0

As shown in Table 7, a total of 100 women of the working age group participated in the study more than half (65%) of the respondents decided on UA products with their husbands. Of the total respondents, 35% make a decision independently.

Large proportions of the respondents (i.e., 99%) were using UA products for both cash crops and household's own consumption. Only 1% of respondents are using UA products solely for household consumption purposes.

The FGD participants confirm in their words:

A question was raised by the researcher, though most of the time you are making decisions with your partner; does the decision incline to the idea brought by your spouse in using UA production and income getting from it?

Women who have participated in FGD answered was:

"Yes, there is still the unfortunate culturally designed fact that, in the relationship between men and women at the household level, most likely what men say is imposed whether I, as a wife or other member of the household, agree or not."

A system of institutionalized discrimination based on men's dominance of women was also advocated by socialist feminists: sexism. Due to the adversarial social connections that this domination has imposed, it is contradictory. The culture and adaptability of social institutions can moderate this conflict, giving the impression that it is a stable connection in some situations and at some points in time; however, until there is no longer a system of dominance, the conflicts cannot be resolved and will eventually come to the surface. (H. P., Booth, and others, (1997).

The respondents confessed that since they physically participated in the UA production, their partners were forced to open the discussion on the use of UA production. However, the weight of the decision will still tend to the idea the man brought to the discussion and decision.

Often I sit down with my husband to discuss our activities and production, especially the animal products, to decide what and how to bring to the market. My husband's proposals get approval. However, when it comes to products for HH consumption, I am usually the one who decides. Sometimes we make a mutual decision.

According to the respondent during FGD, They claimed that through decision-making on what to do on UA production, there is a power imbalance between wife and husband. In a way, the ideology is systematically nailed into the final decision. This can be caused by the patriarchal structure of society. Socialist feminists also support making an equal decision, as part of women have said in the family as well as in society," Democratic councils through which all people control the decisions which most directly affect their lives on the job, in the home, and community"(H. P., Booth, and others, (1997).

4.4. Major challenges of women practicing UA.

According to the FGD and KII, women who engage in various forms of urban agriculture in the research areas encounter several numbers of challenges. They lack access to adequate agricultural technologies, technical support for training, and agricultural inputs such as better seeds, seedlings, pullets, fertilizer, and pesticides. In addition, more urban agricultural land is needed. Apart from the efforts made to organize UA beneficiaries, there are additional issues, such as institutional instability and improper delivery of the necessary technical help from agriculture experts at all levels. Some of the restrictions have been discussed in light of the respondent below:

4.4.1. The Technical Support and institutional instability

Regarding institutional instability, one of the key informants tells that ‘’in the last ten years, the *organizational structure of Addis Ababa's urban agriculture office has changed at least three times*’’. Which is the same result as Endale (2011), Similarly, Mandefro (2010) states that over the past 20 years, major structural changes have taken place in Addis Ababa's urban agriculture unit Agricultural Office, Addis Ababa Administrative Regional Agricultural Development Bureau, and Agricultural Department were its previous names (1994–2003), respectively (2005-2009) Agricultural Extension Service Core Process (AESCP) is its current name under the Bureau of Trade and Industry of Addis Ababa The researcher has noted that one extension agent who reports to and is responsible to the urban agriculture of respective woreds Office is present in each Woreda,It was acknowledged that the degree of human power placement needed to meet the rising demand of farmers in the research area is not now available. Additionally, each extension agent has specific professional expertise in cooperative management, plant science, animal science, or another area of agriculture study. To that effect, deploying a one-sided professional background for one Woreda seems to be "one size fits for all" or "business as usual" because of the wide geographic area and diverse UA activities. Thus the researcher strongly argues, the beneficiaries are not receiving the proper agriculture extension service.

4.4.2. Economic and Technological Constraints

Among the economic constraints, the land is the major challenge faced by women engaged in urban agriculture. The survey questionnaire on assessing the land problem encountered by the urban women farmers revealed that 72 %responded that they are facing problems with land, and

28% said they don't have enough plot land to practice UA Often, they are practicing on the marginal and fragmented land area and their home compound.

The above challenges also stated by Van Tuijl in his research paper, UA may lead to connections with other urban functions, such as living and working. There can be a lack of sufficient with other urban functions, such as living and working. There can be a lack of sufficient and suitable land for agricultural activities in cities (Van Tuijl, 2018).

'Continues displacement from the place practicing urban agriculture has been a challenge for us , some of our land are taken by the government for other economic activities and we didn't get any compensation even though the sub cities administrations promised to do so.'

This also was witnessed by the researcher from during the time of the research, some of the lands were taken by the government for another economic engagements such as for different industrial economic activities.

In Addition to the problem they related with control and accessing plot land, women urban agriculturalist said there is also a problem of having flood every rainy season. One of the FGD members who engaged in crop and vegetable production confessed:

''In addition to the problem related to land, the government bodies are not doing much to tackle the yearly flooding issue, year after year, we are facing problems with the flooding of Akaki River In addition to this, in the non-rainy seasons, we are constantly being challenged by a shortage of water pump to hold irrigation, electricity, medicine for fattening, dairy, and poultry participants''.

The problem of high pricing in UA inputs also raised as a constraint to practice UA as women. During the FGD the problem were raised by both woreda1 and 3 target groups that:

'' As women who practicing UA as a livelihood, we scared on the situation of highly increase price in an input for livestock production such as feeding is increasing time to time , this put us in pressure of increasing the price of livestock and decreasing of our benefit out of livestock profit. Because the profit it minimal due to high price of an input.''

The above problem also was stated by the key informant; that the rate for the hike up of livestock prices and their feed has doubled. It becomes exceedingly challenging to maintain urban

agriculture on a profitable basis. The chance to continue with UA becomes unattainable unless the responsible bodies provide support by offering cattle through credit and other ways. Parallel to the aforementioned issue, urban agriculture's production and productivity have decreased due to a lack of agricultural knowledge, technology, and skills.

4.5. Correlation between food Consumption Score and annual income

In this case, the researcher analyzes the relationship between women's food consumption at the HH level based on collected data in employing the 7 days recall and the annual income of women at the household level obtained from urban agriculture(the total market price value of all output obtained from UA).Hence, it was found that a correlation coefficient (r) is equal to 0.635 of the two variables indicating that there is a strong positive linear correlation between women's FCS in the 7 days recall and the annual income of target women in the households (See Table 8) This is similar to Maxwell and Klemsu (2000), that states "at the household level, urban agriculture can provide a source of income, direct access to a variety of nutritionally rich foods (vegetables, fruits, and meat), and a more varied diet, as well as increase the stability of household food consumption in the face of seasonality or other temporary shortages."

Table 8: Correlation between FCS and Annual Income using the Instrument of 7 days your household has been eating

		the food consumption score	total income of household (Binned)
the food consumption score	Pearson Correlation	1	.635
	Sig. (2-tailed)		.000
	N	100	99
total income of household (Binned)	Pearson Correlation	.635	1
	Sig. (2-tailed)	.000	
	N	99	99

**. Correlation is significant at the 0.01 level (2-tailed). N represents the number of counts or sample size Source: Own survey, 2022.

Accordingly, the coefficient of variation for FCS in the 7 days recall is 0.635, then r2 = 0.365., which means 36.5% of the total variation in FCS of the 7 days recall is to be described by the linear relationship between households' annual income and FCS The rest 66% of the total variation in FCS remains undefined.

4.6. Determinants of House hold Food Consumption

To demonstrate the contributions of urban agriculture to urban women's food security at the household level. The Poisson regression model is not fitted for women who responded to the survey. Because the mean and the standard deviation have very big different results (37.9 and 15.89) respectively. Hence, we used both the linear regression and multiple linear regression models to investigate the relationship between a women's food consumption with the independent variables of a permanent member of the household, annual income obtained from urban agriculture, and the decision they make. Multiple linear regressions and a linear regression model are the most commonly used multivariate techniques for investigating the relationship between a single metric-dependent variable and two or more metric-independent variables. (Singh, 2007).

4.6. 1. Linear and multiple Regression Model of Urban agriculture's contributions to urban women's food Security at the House Hold level

Accordingly, the following equation was used to compute the linear regression

$$Y = a + b1x1 + b2x2+\ldots+bkxk$$

Where Y is a dependent variable and x1, x2 … x are independent variables, and a and b1, b2 … bk are the parameters/regression coefficient. The coefficient of each independent variable signifies the relation that the variable has with Y, the dependent variable are constant (Singh, 2007).

Table.9 .Multiple Regression Model of urban agriculture's contributions to urban women's food security at the HH level

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	42.192	5.714		7.384	.000
	permanent family number	.741	.896	.086	.827	.000
	educational status	-.543	1.508	-.037	-.360	.719
	total income earned per month	..524000	.436	.680	6.780	.000

a. Dependent Variable: the food consumption score

b. Predictors(Constant), the total income of the household(Binned)

Table 9. It helps in assessing whether the independent variable taken is significantly associated with the dependent variable. This is assessed by the statistic F in the ANOVA part of the regression output (Singh, 2007). In this case, F =5, $p < .001$ (SPSS Output: Sig. = .000. It can be reported as $p < .001$), which means that the independent variables are significantly associated with the dependent variable. In addition to this, the above multiple linear regression models show a "p" value of < 0.001, which shows all predictor variables used in the multiple linear regression model are meaningful predictors. As we can see from table 10 above, yearly household income was a significant predictor of the FCS (b=0.524 S.E=0. 436, 0. 68 and Sig =.000), which indicates that household income is a positive and significant determinant for the incident rate of FCS. It means when household income (from UA) increases by a unit, FCS (indicating food security or access), increases by 0.68 units and it is significant, and the permanent family number is a significant determinant.

4.7. Support and kind of Support from NGOs or Govt for the target groups

Table10. Support from NGOs or GOVT for the target groups

Support from NGO or Govt		Frequency	Percent
Is there any support from NGO or GOVT?	Yes	49	49
	No	51	51
	Total	100	100

Based on table 10, 49% of the target population gets Support from NGOs or Govt. The support includes materials that are important to hold UA and technical assistance, whereas 51% of the target population did not have any support from both NGOs and Govt; in addition to table 12,

The FGD participants confirm in their words:

'*The government gives support by providing some modern input like urea, technical assistance, and insecticides after a long period. We need more support from both government and NGOs, especially in providing technical assistance, easy access to credit, adequate land to hold UA and hybrid cows, sheep, and hens, and adequate medication for animal fattening and dairy production. At last, if all the above support is given, we will improve UA production in terms of volume and quality. Hence, this will increase the participation of women in UA, and UA will contribute positively towards women's food security at the household lev*el.'

During the KII , the woreda focal person express their concern in supporting all of the urban women who are practicing in different urban agriculture activities due to the reason , as agriculturalist focal person they have only one specialist and can able to fully support the other activities based on woreda 1, agriculturalist officer stated that :

'*I graduated in Plant science and I am good in giving technical support and advice for women participating in the crop production but not able fully to give technical support for women involving in animal raring and pottery production. Therefore, there is a problem in giving technical support for women who engaged in the UA from the government side because, the officers appointed in the woreda's are one or two personal who have one specialization'.*

CHAPTER 5

SUMMARY,CONCLUSION, AND RECOMMENDATION

This chapter present the summery and conclusion and recommendation of the thesis.

5.1. Summary and Conclusion

The main research question of this research was 'What are urban agriculture's contributions to urban women's food security in the study area?'

Based on the descriptive statistics of the study, the majority of the respondents (68%) were currently married women, whereas (32%) were living with their partner but not married. The educational status shows that 55% of the respondents have attended school. Those working-age women that have achieved diplomas and above are 13.3%. Concerning their permanent number of family, 38 % of the household have about 7-8, 37% have about 4-6, and the remaining have about 1-3 members, respectively.

According to the findings of this research, the average FCS for the entire households surveyed is 37.9. In addition to this, 54% of the target populations have scored more than 35 FCS, which is acceptable. The reaming 32% and 14 % under the group are of borderline FCS (21.5-35) and poor FCS (0-21), respectively. The FCS result indicates that the role of urban agriculture in Women's food security at the household level is manifested through improved household food consumption and the availability of fresh and nutritious food for the family.

Although 35% make decisions independently, 65% of the respondents decide on UA products together with their husbands. Though they make decisions together, the FGD shows that there is still a power imbalance between wife and husband. No matter what, men do enjoy the upper hand they have in decision-making due to the patriarchal system present in society.

According to the FGD and KII, women who engage in various forms of urban agriculture in the research areas encounter numerous challenges. They lack access to adequate agricultural technologies, technical support for training, and agricultural inputs such as better seeds, seedlings, pullets, fertilizer, and pesticides. In addition, more urban agricultural land is needed. Apart from the efforts made to organize UA beneficiaries, there are additional issues, such as institutional instability and improper delivery of the necessary technical help from agriculture experts at all levels.

The linear regression model tested in this study also demonstrates the association between the dependent variable (FCS) and independent variables, such as family size and annual income obtained from UA products, are highly significant. Additionally, the determinant effect of the combination of independent variables on the dependent variable is considerably high.

Moreover, the survey of 100 households engaged in urban agriculture resulted in the Working-age group women with the lowest (3000-25000, low (2500-45000), medium (45001-80000), higher (80001-150000) and highest income earner (more than 150000) Ethiopian Birr have expected mean of FCS of 37.6552, 37.4792, 38.2308, 39, 42.7778 respectively.

To that effect, there is a strong correlation between FCS and Annual Income. Using the instrument of 7 days, household consumption results, in a correlation coefficient (r) of 0.635, show a strong positive linear correlation between the two variables. In parallel to this, as we can see from table 11, Household annual income was a significant predictor of the FCS (b= 0.000 S.E=0.000 Sig =.000), and the incidence rate ratio (found in EX (B) column) is 0.68. This indicates that household income was a positive and significant determinant of the incident rate of FCS. The incidence rate ratio shows that for every unit increase on the predictor, the predicted incidence rate changes by a factor of 0.68(meaning the incidence rate was increasing).

Based on these results, we can conclude that the income obtained from urban agriculture contributes to the household's food access through its role in improving their purchasing power and strengthening the coping capacity of women. This implies that the increased income for women due to practicing urban agriculture improves the food security of women at the household level. The result also showed, the product women got from UA helps them to increase their food intake and balanced diet which contribute to the food security of women in the HH level.

5.2. Recommendation

Based on the finding of this research the following recommendations can be made. Accordingly, UA has the capability of determining women's food security at the household level in Addis Ababa. A positive relationship is also observed between household income and FCS Household income is a significant determinant of FCS Furthermore, the effect of household income on the FCS of the study area differs among the five quartile income groups. The results show that; as the income of the household increases, the FCS increases; accordingly, the difference in the household income obtained from UA among the working age group women of the research area may have a greater impact on population FCS and food security of women at the household level. Depending on the result of the study, it is possible to suggest that:

I. There should be a focus on microeconomic programs (like improving the living standard) for women and reducing the living cost of society by taking measurements like easy access to credit; access to farming plot land through lease or renting.
II. Providing modern UA input by both the Govt and NGO.
III. Extension and training on empowerment and advocacy to raise their voice in the HH,
IV. The responsible bodies provide support on animal feeding parallel to the aforementioned issue,
V. Providing necessary knowledge, technology, and skills for the production of better urban agriculture production by the women so that the women can be benefited from the UA to alleviate the food insecurity in the HH.
VI. The result of the study could also contribute to the literature on the contribution of UA on women's food security at the household level and as efforts are made to test the main theoretical perspectives by providing empirical evidence that predicts the outcome of differences in UA and food security of women in the household.

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ANNEX ONE

INTRODUCTION AND CONSENT

QUESTIONS AND FILTERS CODFILTEREGORIES SKIP

Hello, My name is HilenaAmare. I am an Addis Ababa University graduate student. At the Household level, I am surveying urban agriculture's contributions to urban women's food security. This data will be used as input for the student's research studies. Furthermore, it can be used as additional input for government and non-governmental institutions in their studies for planning food security, policies related to urban women's food security, and economic policies and strategies.

To suggest possible strategies for improving the food security level of urban women who are participating in UA, your household was selected for the survey. The questions may take about 20min Your responses will be kept strictly confidential and will not be shared with anyone other than members of our survey team. You are not required to participate in the survey, but we hope you agree to answer the questions because your opinions are valuable. If I ask you a question and you don't want to answer it, just let me know, and I'll move on to the next question, or you can end the interview at any time.

If you have any questions about the survey, please contact the person listed on the card that was distributed to your household.

Do you have any further questions?

Can I start the interview now?

I General Information

Name_____Sex____ Age_____

Marital status

1. Married
2. Living together but never married.

What is your husband's or partner's employment status?

1. Government employed
2. Self-employed
3. Private company employed
4. Daily worker
5. Pension

Educational status

1. Non-formal education___ 2. Primary school ____

3. Secondary school____ 4. Diploma ___ 5 degrees and above

Permanent number of Family size

Male ----------

Female ----------

Location _____

II. ***Consumption Of different Food***

1. **Food Consumption Score** would like to ask you about the different foods that your household members have eaten in the past 7days. Could you please tell me how many days in the past 7 days your household has been eating these foods (Note: for each food, ask what the primary source of each food is as well as a main secondary source of food if there is at all)

#	Food item	# days have eaten in the past week (0-7 days)	Source of food (see codes below)	
			Primary	Secondary
1	Injera or Maize			
2	Bread /wheat			
3	Rice,			
4	Tubers			
5	Groundnuts and pulses/shero/			
6	Fish (eaten as the main food)			
7	Fish powder (used for flavor only)			
8	Red meat (sheep /goat /beef)			
9	White meat (poultry)			
10	Vegetable oil, fats			
11	Eggs			
12	Milk and dairy products			
13	Milk in tea in small amounts			
14	Vegetables (including leaves)			
15	Fruits			
16	Sweets, sugar, honey			

Food source codes

1. Purchase =1 Own production =2 Traded goods /services, barter =3 Borrowed =4
2. Received as gift =5 Food aid =6 Others (specify) =7

Source; Adopted from FAO Food Consumption Score

1. In which activity of urban agriculture practiced by the family
    a) Poultry
    b) Dairy
    c) Fattening
    d) Vegetable
2. What do you do with your UA products?

    a) Do you use it For HH Food Consumption
    b) Do you use it For sale
    c) Both (For HH consumption and sale)

3. Do you get an income from UA production?

    1 Yes 2 No

4. If your answer is 'Yes' to question number 3, who has access to the money and decides on what to spend?
    a) Myself
    b) My husband
    c) Both of us
5. If it is your husband, what does he do with the money you get from UA production?
    a) Buying food for the family
    b) For paying bills
    c) Saving
    d) His spending

6. What would you have done; first, if not your husband but you were the one to decide on the money you get from UA.
    a) Buying food for the family
    b) For paying bills
    c) Saving
    d) Your spending
7. The amount of money received per month from the UA is ----------

8. Either any support that you get from NGOs or GO's?

    a. Yes GOs b No

9. If your answer to question number 8 is YES, What are the benefits you get from NGO's GOs in supporting you as a woman in benefiting from urban agriculture if any, support?
    a. Gift
    b. Technical assistance
    c. Material
    d. Credit

10. As a woman, what do you think needs to be done for women from UA at the Household level to be better in practicing UA to improve your food security ?

    a. Easy access to credit
    b. Technical assistance
    c. Easy access to held UA
    d. Government support in government UA materials and equipment

ANNEX TWO

III. Focus Group Discussion

11. What are the major challenges you faced in conducting UA?

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12. Who has control over the UA product at the HH level?

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13. Whose idea is accepted in the household regarding a decision on UA products?

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14. Does the Addis Ababa City administration give support to ensure the benefits of women in urban agriculture at the HH level?

a) 1 Yes b No

15. If your answer is' yes' for question number 10, What kinds of support do you get from

a. ADDIS ABABA City administration urban agriculture department :

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b. NGOs and stakeholders:-

ANNEX THREE

III. Key Informant interview

Name ----------

Organization----------

Position ----------

1. What are the contributions of UA to the food security of women at the HH level?
2. What are the challenges faced by women participating in UA?
3. Do women participating in UA use the product for household food consumption?
4. What are the possible strategies for improving the food security level of urban women who are participating in UA?
5. What policy, strategy, program, and support are needed from the government or NGO to stimulate and promote women in benefiting from urban agriculture practice in the city of Addis Ababa.In, in particular in Akaki –Kaliti, Sub-City, Addis Ababa, Ethiopia?

ANNEX FOUR

Model Summary

Model	R	R Square	Adjusted R Square	Std. An error in the Estimate
1	.763[a]	.521	.506	15.63912

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	95.713	1	95.713	3.91	.000[a]
	Residual	23724.474	97	244.582		
	Total	23820.187	98			

a. Dependent Variable: the food consumption score

b Predictors: (Constant), the total income of the household (Binned)

Model Summary

Model	R	R Square	Adjusted R Square	Std. ErroThe error the Estimate
1	.761[a]	.516	.5016	16.09512

a. Predictors: (Constant), total income earned per month, educational status, permanent family number

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	388.900	3	129.633	5.00	.000[a]
	Residual	24610.009	95	259.053		
	Total	24998.909	98			

a. Dependent Variable: the food consumption score

b Predictors: (Constant), total income earned per month, educational status, permanent family number

ANNEX FOUR

Pictures of Study area

Source: Author 2023