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COLLEGE OF SOCIAL SCIENCES

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

ROLE OF URBAN AGRICULTURE IN HOUSEHOLD FOOD SECURITY IN PERI-URBAN ADDIS ABABA: A CASE STUDY OF WOREDA 01 NIFAS-SILK-LAFTO SUB-CITY

THESIS SUBMITTED TO DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR MA DEGREE IN URBAN AND REGIONAL DEVELOPMENT PLANNING

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ADDIS ABABA ETHIOPIA

Statement of Declaration

I, the undersigned, declare that this study is my research work and has not been presented in any other university, and that all sources of materials used for the study have been accordingly acknowledged.

Name_____

Date _____

Signature_____

APPROVAL PAGE

We, the examiners committee, acknowledge that this work has gone through the defense and review process.

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Abstract

The purpose of this study was to investigate the role of urban agriculture in household food security in peri-urban Addis Ababa: a case study of the Woreda 01 Nifas-Silk-Lafto Sub-city. Therefore, the objective of this study is to investigate the role of urban agriculture in household food security and, It also tries to see the types of assistance needed and suggests possible solutions to the problems. *This study employed a cross-sectional survey design. On the other hand, the study were gathered using questionnaire survey of 212 households used multistage sampling techniques to select the target population. Additionally, the study employed both qualitative and quantitative methods to collect the data. To obtain quantitative data the study used structured questionnaires whereas qualitative data was obtained through field observation, document review and semi-structured interview. Moreover, the study used both primary and secondary data sources. The data were analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation. Additionally inferential statistics correlation analysis and binary logistic regression were used. Inferential statistics used to assess the association or the relationship between dependent and independent variables. The results of the study showed that urban agriculture has played an immense role in changing the food security of urban society for the better. 68.86 percent of the respondents replied that urban agriculture has the potential to minimize food insecurity. The major challenges to urban agriculture in 01 Nifas-Silk-Lafto Sub-city include a lack of credit services, a lack of money, an absence of land, an increasing number of people in urban areas, and the absence of adequate transport systems. Furthermore, the main reasons for not ensuring food security in the city were the rapid growth of the population, the lack of appropriate institutions, weak land policies, and the lack of household training.. Furthermore, the majority of people do not have the more skills, and there is no educational preparation to work in urban agriculture. The researcher recommends that, in order for urban agriculture to grow, farmers should be given short training on agricultural practices by people who have knowledge about urban agriculture or agricultural experts, and they should be taught about agriculture. In addition, to develop urban agriculture, farmers should use modern farming tools such as improved seed, fertilizer and so on.*

Keywords: Urban agriculture, food security, *peri-urban district 01 Nifas-Silk-Lafto Sub-city*

List of abbreviation

AACA	Addis Ababa city administration
AAFUADC	Addis Ababa Farmers and Urban Agriculture Development Commission
AU	Urban agriculture
CSA	Central Statistical Agency
EIAR	Ethiopia institute of agricultural research
FAO	Food and Agriculture Organization
FDACS	Florida department of agriculture and consumer services
GIS	Geographic information system
KII	Key Informant Interview
SD	Standard deviation
SPSS	Statistical Package for Social Science
SSA	Sub Sahara Africa
UA	Urban Agriculture
UNEP	United nation environment programmer
UPA	United progressive alliance
USAID	United States Agency for International Development
USDA	United State Department of Agriculture
UNPEP	United Nation Environment Program
UPI	Urban Physical Infrastructure
WFP	World Food Program

CHAPTER ONE

Introduction

1.1 Background of the Study

A large proportion of the world population is food insecure and undernourished. Available data (FAO, 2020) suggests that the number of food insecure and hungry people has consistently increased globally. Current estimates are that nearly 690 million people or 8.9 percent of the world population, are hungry up by 10 million people in one year and by nearly 60 million in five years. The number of people affected by severe food insecurity, which is another measure that approximates hunger, shows a similar upward trend. In 2019, close to 750 million – or nearly one in ten people in the world – were exposed to severe levels of food insecurity (FAO, 2020).

In terms of the distribution of total food insecure (moderate or severe) people in the world, out of 2 billion people suffering from food insecurity, 1.03 billion are in Asia, 675 million in Africa, 205 million in Latin America and the Caribbean, 88 million in Northern America and Europe and 5.9 million in Oceania". The above sources have further indicated that a large proportion of the world's hungry people are living in sub-Saharan Africa particularly in rural areas (FAO, 2020). The situation is worsening particularly in Eastern Africa, "where one-third of the population is estimated to be undernourished" (FAO 2019), due to a combination of economic, physical and environmental, social and political and factors.

Ethiopia is one of the most food insecure countries in Eastern Africa. A large proportion of the country's population faces the problem of food security and hunger (FAO, 2018). According to world food program December 14, 2022, an estimated 22.6 million people are suffering from food insecurity across Ethiopia.

The problem of food security varies between urban and rural areas of the country. About 85% of the country's populations live in the rural areas. Rural food security is one of the defining features of rural poverty, particularly in the moisture-deficit northeast highland plateaus and some pastoral areas of Ethiopia (FAO, 2018). The Tigray region of Ethiopia continues to experience one of the world's worst food security emergencies. Humanitarian aid is urgently

needed to save lives. Extreme results are likely through at least January 2022 across the region, with central, northwestern, eastern, and southeastern Tigray being the most worrisome (WFP, 2022).

Many southern and southeastern pastoral areas experienced consecutive poor seasons in late 2020 and early 2021, resulting in lower than normal pasture and water availability. These conditions are expected to drive a typical livestock migration and further declines in livestock body conditions and milk production through at least October (USAID, 2022).

Another problem Food insecurity in Ethiopia derives directly from dependence on undiversified livelihoods based on low-input, low-output rainfed agriculture. Ethiopian farmers do not produce enough food even in good rainfall years to meet consumption requirements (WFP,2022).

Food insecurity in Ethiopia is not only a rural problem, also Urban food insecurity is a growing concern due to the toxic combination of high rates of urban poverty, high dependency of urban households on food supplied by the market, and fluctuating food prices. Widespread and severe acute food insecurity is expected across urban area in Ethiopia through at least mid-2023, and a higher number of people are in need of food aid (WFP,2022). Yet little is known about the determinant of food insecurity, the challenge and the food gap in Addis Ababa.

In spite of the fact that that the role of urban agriculture in enhancing household food security in Addis Ababa is little investigated, a growing body of literature indicates that urban agriculture plays an important role to improve food security (WFP,2021). Urban and peri-urban agriculture contributes to Addis Ababa's food basket, constituting a major source of the city's green vegetables, eggs, poultry and dairy products. The sector also contributes to economic vitality within the urban food system, particularly by providing households for the urban poor, though the extent to which this group engages in urban peri agriculture is not well quantified (UNEP,2019). It has also additional benefits such as employment creation, improvement in microclimate and ultimately it supports to meet most sustainable development goals.

1.2 Statement of the Problem

Many studies document that Urban Agriculture is an increasingly important household activity in developing countries which contribute significantly to both household systems and the urban economy.

Ethiopia is a country where traditional agriculture of low productivity and there has been an acute shortage in food supply and hence food self-sufficiency is a primary issue in the national agricultural development policy (FAO, 2020). Consequently, urban food security is an emerging area of development concern, and it is fundamentally different from questions of food security within the rural and urban area. Rural agriculture is not in a position to supply food both for the rural and the urban population. Due to highly accelerated rates of urban growth more and more rural land is converted to residential areas from time to time (Davies, 2021). This has affected the total food supply and has thereby contributing to food shortage and increase food price. Yet little is known about the roles of food insecurity in the city of Addis Ababa, making it difficult for development practitioners and policy makers to quantify the challenge and to proactively plan to reduce the food gap that exists in urban areas.

Urban agriculture has a great role in achieving food security, but Most of the urban development studies in the developing countries concentrate on housing, urban services and non-agricultural activities (WFP, 2021). However, they mainly exclude or give little attention to urban agriculture. There is not much literature on urban agriculture production but the literature that is available acknowledges the role that urban agriculture plays in meeting the food needs of many households in urban areas.

There is also absence of statistical data how urban agriculture is filing the food gaps and the current is urban land availability and expanded to accommodate urban food needs. Therefore, the study is conducted to assess as the populations grow within city, the challenge for securing food situation has become very important to different stakeholders including the government, civil society and families among others (Mahlet, 2018).

The question of the contribution of urban agriculture to food security has become increasingly important and there is need to conduct a study so as to establish its importance. Further there is need to study what factors are influencing farmers involvement in urban agriculture and what

they are doing, their challenges, and opportunities of urban agriculture in terms of attaining household food security. Additionally there is need to seek an understanding on what problems/challenges are the farmers facing during their activities while last but not the least, what is urban farming. Yet it is not well developed for at least two reasons.

First, those who practice urban agriculture have a limited knowledge on how to develop and manage it in a productive way. Second, similar to several other countries in SSA (Davies, 2021), there is inadequate holistic support for urban agriculture in Ethiopia manifested by the lack of attention it receives from the government and development agents

This study were focus on urban farmers dealing with urban agriculture and other field crops for home consumption and income generating, problems in practicing urban agriculture including: low productivity goods, low management practices, poor extension services and inadequate credit facilities, availability of few or limited research activities and lack of organized marketing and processing facilities with particular emphasis on woreda 01 of Nifas-silk Lafto sub-city of Addis Ababa.

1.3 Objective of the Study

1.3.1 General Objective

The general objective of the study was to investigate the role of urban agriculture in household food security: case study in woreda 01 of in Nifas-Silk-Lafto Sub-city.

Peri-urban Addis Ababa.

1.3.2 The Specific Objectives

The specific objectives of this study were to:

- To assess the status of the socio-economic and demographic characteristic of farmers who are practicing urban agriculture in peri-urban Addis Ababa.
- To identify the challenges and opportunities of households who are practicing urban agriculture in the study area.
- To investigate the roles of urban agriculture to attain food security among the studied households.
- To examine the governmental policies that exist to support urban agriculture toward improve food security

1.4 Research Questions

Given the objective, the study would answer the following questions:

1. What are status of socio-economic and demographic characteristics of farmers, who are practicing urban agriculture in per-urban Addis Ababa city?
2. What are the challenges and opportunities of households who are practicing urban agriculture in the study area?
3. What are the roles of urban agriculture to attain food security among the studied households?
4. How do the governmental policies that exist to support urban agriculture toward improve food security?

1.5 Significance of the Study

Urban agriculture practice strategies become the main concerns of nations starting from the last couple of decades. This is Rapid and extensive urbanization of less developed countries is perhaps the most dramatic demographic phenomenon of our modern times. This trend aggravated the number of people living in cities and surrounding it resulting the increase in demand of food supply in the urban area. The fact in the country general and Addis Ababa in particular is an observable truth. The study found that urban agriculture plays a significant role in improving households' food security and income. It offers opportunities for food security among households and has the potential to minimize food insecurity. Additionally, urban agriculture provides a source of locally grown food, which can supplement household diets and reduce reliance on external food sources. Additionally, measures to address land availability and transportation issues can help improve the conditions for urban agriculture in peri-urban areas. Furthermore, promoting sustainable urban agriculture practices and providing support for technology adoption and access to inputs can also help address the challenges faced by households engaged in urban agriculture.

The finding also has been believed to be critical to planners to re assess their planning and zonation of areas for agriculture in the city and for the municipality to give more emphasis to urban agriculture. The research would provide knowledge about the role of urban agriculture on household food security. The study would aid policy-makers and executive bodies at administrative levels as it provides input in to enhance employment in urban areas. The study

would benefit urban people and is important for other researchers as references. Food security was the question of urban food problems and related difficulties, especially very low access and production of vegetables and fruits in the area, urban agriculture can provide quick answer and remedial solutions to this end.

1.6 Scope of the Study

This research is delimited to geographical conceptual, and methodological. Geographically, the study was carried in woreda 01 Nifas silk sub city and surrounding areas. The study aims at shedding light on the general features of the role of urban agriculture and its impact on household food security in woreda 01 of Nifas-Silk-Lafto Sub-city. As such, its scope is limited to the assessment of the practices, challenges, opportunities and consequences of urban agriculture in relation ensuring food security among farmers across in the study area.

1.7 Limitation of the Study

The limitations that encountered during the research process emerged from lack of urban population data size in the past and present basic population data that is up dated data that are practice in urban agriculture. It is challenged to get reliable data and lack of sufficient reviews literature written in the study area were the major limitation challenges faced during the study.

So as to minimize influences of these limitations, the researcher has tried to tolerate and as well as explained to the farmers that their responses are used only for research purpose.

1.8 Organization of the Thesis

This research report has been organized into five chapters. The first chapter presents introduction, which mainly focuses on the statement of the problem, objectives of the study, significance of the study and scope of the study. Chapter two treats review of related literature. Chapter three deals with methodology, chapter four presents the results and discussion of the study. Finally, chapter five deals with conclusion and recommendations which drawn from chapter four.

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CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

Introduction

This literature review focuses on the role of urban agriculture in food security that show the practices, challenge and opportunities of urban agriculture in Addis Ababa. Further, it also reviewed study, research and documents on urban agriculture done anywhere globally. The aim is to understand the concept of urban agriculture scientifically like its definition and its context indifferent cities in the world. This study includes three basic sections. The first section deals with the theoretical framework, the second section deals with empirical evidence and, the last section deals with the conceptual framework the researcher has review the global and national researches related with experience on how urban agriculture is managed to meet urban food supply and other co-benefits.

2.1 Concept of urban agriculture

There is no standard definition of urban agriculture. Definitions depend on geographic region or field of practice. Urban agriculture is a general term that refers to the production, processing, distribution, and sale of food within urban, suburban, and peri-urban (i.e., on the perimeter of urban areas) areas for commercial, non-commercial, hobby, educational, or nonprofit purposes (Campbell, 2022). The definition of the term "urban agriculture" includes activities beyond food production; for that reason, it could be understood to be equivalent to the term "urban food systems." Examples of urban agriculture activities include: Food-producing gardens (home, community, school, institutional, market, or rooftop) and, Bee, poultry, aquaculture, and animal keeping, Edible landscaping Urban farms, including indoor and rooftop farming, Innovative food-production methods, such as vertical farming, hydroponics, and aquaponics, Farmers' markets, community-supported agriculture, or mobile produce trucks (Campbell & Rampold, 2021).

In addition to agriculture in dense urban areas, urban agriculture is generally understood to include suburban and peri-urban areas, which are on the perimeter of urban areas. Urban agriculture may be more simply thought of as agriculture that is not conventionally rural, in areas

that are not typically zoned for agriculture, where residents might be more tightly concentrated, and where food production exists alongside other businesses (Campbell, 2022).

The size of urban agriculture depends on available space within an urban landscape and the intended use of the farm or garden, but size is not a limiting factor of its characterization. Because urban agriculture includes edible gardening in private residences, the scale of urban agriculture ranges from as small as potted herbs on an apartment balcony to in-ground farms larger than 10 acres. In dense urban areas, space limitations make small farms and gardens more feasible than large, multi-acre operations. Suburban and peri-urban areas have the benefit of larger parcels of undeveloped land—land which often includes agriculture as a principal or allowable use—and can accommodate larger farms that engage in diversified high-volume production or activities (FAO,2022).

Increasing the size of urban agriculture operations can be difficult in highly urbanized areas. Additionally, because urban farms are in areas that are not traditionally zoned for agriculture, they may be subject to local zoning and land-use regulations that rural farms are not. However, as urban agriculture increases in popularity, innovations, policies, and community support have made scaling up and intensifying production more feasible (Halvey, 2020).

2.2. Concept food security

The multifaceted concept of food security is defined and interpreted differently by different scholars. Food security is the measure of an individual's ability to access food that is nutritious and sufficient in quantity. Some definitions of food security specify that food must also meet an individual's food preferences and dietary needs for active and healthy lifestyles (Austin Fahy, 2021).

2.3. Theoretical perspectives

2.3.1. Relationship between urban agriculture and food security

Rapid urbanization increases the urban population and the number of insecure urban poor. This increasing growth of urbanization creates absolute and relative growth in urban poverty and food insecurity as the biggest challenges of the urban area (Poulsen, 2015). urban population becomes a major challenge especially for the developing countries in Asia and Africa in particular. To

tackle the urban food demand, urban agriculture has a great potential in providing means to food security through providing fresh, nutritious and near-to-get-products.

Urban Agriculture is thought to increase food security through two main pathways: improved access to food, and increased income A number of existing systematic reviews have touched on the issue of UA and food security (Berti, 2020). Reviewed the effectiveness of agriculture interventions in improving nutrition outcomes. Even though they did not make specific reference to the urban sector, Berti and colleagues' findings might indicate trends applicable to urban households. urban agriculture could therefore become an instrument that could tackle household food insecurity if intended towards increasing urban food production through productive participation in urban development.

Many literature sources depict that considerable number of low-income households as well as some higher income households are constantly turning to urban agriculture for the production of food for own consumption and income generation.

2.4. Urban agriculture: common dimensions

To integrate into urban landscapes where space and resources are limited, urban agriculture utilizes growing techniques similar to those used in rural agriculture as well as a number of technologically innovative production methods. Many common agricultural inputs, such as water, compost, manure, topsoil, fertilizers, growing media, mulch, and pest and weed control, may not be as readily available as they are in rural agricultural communities (Dobson, 2021). However, as demand increases, some farm and garden supplies are becoming more readily available in urban areas.

Agricultural techniques that are traditionally used in rural agriculture are also used in urban agriculture, including in-ground, raised-bed, and controlled-environment methods (e.g., protective structures such as hoop houses, high-tunnels, and greenhouses). To support ecological biodiversity and produce a variety of fruits and vegetables, urban farmers and gardeners tend to use organically-informed farming methods, limit pesticide and herbicide use, and prioritize soil health and remediation (Dobson, 2021).

Hydroponics, aquaponics, and vertical farming are high-tech growing systems that are well suited to produce foods in indoor and outdoor environments (McCartney & Lefsrud, 2018). Hydroponics and aquaponics produce foods without the use of soil, and typically supplement plant nutrients with irrigated water solutions. Hydroponics, aquaponics, and vertical farms can defy traditional agricultural limitations presented by seasons and soil when grown in controlled environments. However, they require a slightly different set of resources to maintain, including supplemental lights, plumbing systems, and electricity (Sandoya, 2021). Intensive year-round production can increase economic benefit on valuable urban land due to its level of productivity per square foot of vertical space.

2.4.1. Types of urban agriculture

The types of foods produced through urban agriculture are as varied as foods produced rurally. However, due to urban agriculture's relatively small scale, urban agriculture tends not to produce high-volume commodity crops, such as corn, soy, wheat, or cotton. Urban agriculture is more likely to produce foods that are classified by the USDA as specialty crops, such as seasonal and regional fresh fruits and vegetables, leafy greens, microgreens, mushrooms, and flowers, as well as value-added products, poultry and animal keeping, aquaculture products, and compost (Singh, 2019).

Fruits and vegetables

Fruits and vegetables are grown in all types of urban agriculture and are the most commonly cultivated urban agriculture product (Campbell, 2022). Fruits and vegetables grown outdoors follow microclimate and season, while indoor, climate-controlled growing can transcend seasonality. Urban growers in Florida produce a wide variety of crops, including root crops such as potatoes, sweet potatoes, carrots, and beets, leafy greens, lettuces, herbs, annual bushes and shrubs such as tomatoes, okra, and roselle, and perennial plants such as pineapple, guava, and lemongrass. Depending on the growing zone, Florida growers also raise citrus, avocado, banana, peach, loquat, persimmon, papaya, and mango trees (Ellis, 2021).

Beekeeping

Many urban farmers and backyard gardeners keep bees for honey production and pollination. Honey produced from beekeeping is considered a cottage food. In the state of Florida, beekeeping requires a permit. Backyard beekeepers can manage up to 40 colonies, while sideline and commercial beekeepers manage 41 to over 100 colonies (Bustamante, 2019). Bees require a diversity of pollen-producing plants to ensure colony nutrition and honey production (Ellis, 2021).

Poultry and animal keeping

Raising poultry, such as chickens, turkeys, quail, pigeons, and ducks, can integrate into urban food production systems for its direct outputs (e.g., eggs, meat), and its ecological contribution to farm and garden systems (creating fertilizer or soil amendments). Poultry keeping is feasible for backyard gardens or at scale, is often recognized by urban agriculture ordinances, and integrates well into small production systems. Poultry keeping can produce meat and a consistent supply of eggs at the household level or for commercial production. Additionally, chickens and other birds can consume certain organic kitchen waste that creates manure, which is further composted and used to amend and fertilize soils (Hochmuth, 2021).

Raising livestock, such as cows, pigs, goats, and sheep, is typically not permitted in urban areas and is less desirable due to space constraints and odor concerns. Suburban and peri-urban farms, however, will occasionally keep a small stock of animals for systems management, dairy production, and cuts of meat.

Aquaculture

Aquaculture is the practice of growing organisms in water. Products differ based on locale. Its operations produce fish, shellfish, or aquatic plants in lakes, ponds, reservoirs, coastal or marine waters, or controlled environments in urban, suburban, and peri-urban areas (Brooks & Conkle, 2019). Florida aquaculture produces shrimp, lobster, and crab. Aquaculture operations breed, raise, and harvest fish such as tilapia (in aquaponic systems), grouper, and snapper. They also harvest alligators, oysters, and clams along both Florida coasts (FDACS, 2016). Aquaculture systems can exist on their own to produce food for consumption or integrate into aquaponic

systems to produce aquatic organisms, leafy greens, and other cash crops. Aquaponic systems, which are similar to hydroponic systems, utilize the nutrient-dense fish waste from aquaculture production and water circulation systems to supply nutrients to crops (Tyson & Simonne, 2021).

Value-added products

Value-added products can be an important output of some urban agriculture operations and can offer an additional source of revenue. Value-added products are created when a farm processes a product in order to make it more valuable. For example, fruit jams or pickles are produced by farms to increase the value of the raw produce and increase its shelf stability (Singh, 2019). In certain circumstances, value-added foods are classified as "cottage foods." Cottage foods are foods produced in unlicensed kitchens that can be sold directly to consumers but are not permitted to be sold wholesale or on consignment. Value-added products and cottage foods commonly include baked goods, dried herbs, jams and preserves, honey, or vinegars, and can be produced by urban agriculture enterprises or external purveyors, utilizing urban agriculture-produced foods.

Compost

Importantly, compost and manure as organic fertilizers and soil amendments can also be produced through urban agriculture and are an important aspect of a local and sustainable food system. Compost is generated on either large industrial or smaller, human-powered scales to process materials into a nutrient-rich soil that can be used on-farm, donated, or sold to local growers. As mentioned above, when poultry are raised in urban environments, their waste can be captured and integrated into compost systems to make nutrient-rich fertilizers that support organic farming methods and promote environmental resource preservation and sustainability (Hochmuth, 2021).

2.4.2. Benefits of urban agriculture

Food security

One of the primary benefits of urban agriculture is improved food security. Urban agriculture can help to increase access to fresh, nutritious food for city residents, especially in low-income neighborhoods where access to healthy food is often limited. By growing food locally, urban

agriculture reduces the reliance on long-distance food transportation, which can be costly, energy-intensive, and environmentally damaging.

Economic benefits

Urban agriculture can also provide economic benefits, including job creation and income generation. Urban farming can create opportunities for entrepreneurship and small business development, especially for individuals who face barriers to traditional employment.

Community building

Urban agriculture can also strengthen community ties and promote social cohesion. Community gardens, for example, provide a space for residents to come together and collaborate on a shared project. Urban agriculture can also create opportunities for intergenerational learning and cultural exchange.

Environmental benefits

Urban agriculture can also provide significant environmental benefits. By promoting local food production, urban agriculture reduces the carbon footprint associated with long-distance transportation. It can also improve air and soil quality and promote biodiversity in urban areas.

2.4.3. Challenges of urban agriculture

Limited space

One of the primary challenges of urban agriculture is limited space. Urban areas are often densely populated, leaving little room for agricultural activities. Finding suitable land for urban agriculture can be a significant barrier, especially in low-income neighborhoods where land ownership may be limited.

Contaminated soil

Urban soils can be contaminated with a variety of pollutants, including heavy metals, pesticides, and industrial chemicals. Soil contamination can pose health risks for both farmers and consumers, making it essential to test soil before planting and to take appropriate measures to remediate contaminated soils.

Limited access to resources

Urban agriculture may face limited access to resources, including water, seeds, and other inputs. In many urban areas, water is a scarce resource, and farmers may face restrictions on water use. Access to high-quality seeds and inputs can also be limited, which can reduce crop yields and quality.

Permitting and regulations

Urban agriculture may also face regulatory barriers, including zoning laws, health codes, and food safety regulations. These regulations can limit the types of crops and animals that can be grown in urban areas and can create additional costs for farmers.

2.5. Urban agriculture challenges in Addis Ababa

Agriculturalists in Addis Ababa face challenges in maintaining their foothold, both practical and ideological. Practical limitations related to input costs, land and water are augmented by socio-cultural and institutional perspectives of urban agriculture. Various studies on UA have shown that "different actors not only hold different concepts of urban agriculture and of its place in the city (AAFUADC, 2020).

Urban agriculture risks associated with climate change

When considering the variety of drivers and stressors currently acting on UPA in Addis Ababa, climate change is not an important factor. However, climate change is likely to become more prominent in the future given projections of increased temperature and shifts in the seasonality of rainfall. Decadal analysis of climate trends preliminarily indicates evidence of potential climate change manifested through an increase in maximum temperature, increasing rainfall during the *Kiremt*(long) rains and decreasing rainfall during the *Belg* (short) rains. Additionally, the incidence of heavy rainfall events during *Kiremt* months has increased over the last several decades. These findings corroborate observations of increased flood risks and untimely rains that farmers are experiencing. (AAFUADC, 2020).

Inadequate service provision

Access to advisory and training services, Provide training & technical advice to urban farmers on, On farm management, Ecological farming practices, Proper management of health risks, Business development. Lack of credit and extension services: Urban farmers lack access to formal credit services. Due to the small-scale nature of their operations most require short-term finance which is not available to them through conventional lending institutions. The Ministry of Agriculture and 12 other formal institutions have never extended such services to urban farmers. This is because urban farmers are not considered real or full time farmers; they are simply seen as urban dwellers. They are thus forced to purchase inputs like seeds and fertilizers on the market at higher costs. Extension services are not extended to urban farmers for similar reasons (AAFUADC, 2021).

2.6. Urban agriculture Institutional arrangement in Addis Ababa

Urban agriculture for Addis Ababa is not a new. It has been a major part of the urban scene from the very beginning of the city's development as the capital of Ethiopia Households use their back yard in planting vegetables and fruit for household consumption. There is a practice of urban agriculture in areas where the city major rivers pass. Where people farm in the individual and communal land to produce vegetables and fruits. The local government has structure for supporting the urban agriculture. The office has involving its name and vision at different time based on the national and local plan proprieties for urban agriculture (Amsalu, 2020).

These are the historical organizational structure and name for urban agriculture in the city are as follows: Before 1983 Addis Ababa region agricultural bureau, Regional 14 Agriculture Bureau from 1983 to 1995 EC, Urban agriculture office from 1995 to 2011 EC, Core Process Owner from 2001 to 2011 EC and, Since 2011 EC Farmers and Urban agricultural development commission.

The current city urban agriculture vision is stated as: *To see UA significantly contribute to household food security, income generation, job creation and brought a change in the life of the community through safe, conducive and productive living environment'*(AAFUADC,2020). To meet this vision, the farmers and urban agriculture development commission, promoting linkages among stakeholders to work together and react challenges to achieve high benefits of urban

agriculture. Stakeholders in the value-chain of urban agriculture should participate in the role and pave the way to work in cooperation for enhancement of UA development in the city.

2.7. The city urban agriculture practice

2.7.1 Current urban agriculture practice

Urban agriculture practice can be understood from different sides. These are the scale of production, the type of ownership, the types of agriculture discipline etc. Based on the scale of production. The city urban agriculture can be categorized into micro, meso and macro level. Based on the ownership the urban agriculture individual farms, family farms, groups or cooperative farms and enterprises (AAFUADC,2020).

The major planning components with respect to encouraging urban agriculture are promoting mixed agriculture in the southeastern areas of the city, encouraging horticulture development along the riverbanks and encouraging livestock development in the peripheries. With respect to promoting mixed agriculture, technical support was given for crop and vegetables production, poultry production, dairy farm, bee keeping and livestock fattening in Yeka, Bole, Akaki-Kality, Nefas Silk Lafo and Kolfe-keranyo.

Urban farming has been a permanent feature of the city's riverine landscape for a long time. Many streams and rivers traverse the city, but most of their valleys are unsuitable for construction uses and are thus better suited for urban farming. Most of this land belongs to the municipality, as all unoccupied land is within its jurisdictions. One of the most extensively used river valleys for irrigating urban farms in Addis Ababa is the Little Akaki (AAFUADC, 2020). The Mekanisa-Gofa-Lafto co-operative farm is located along this river, the oldest and largest irrigation farming cite in the city. The site stretches from Mekanisa in the north to the foot of the Lafto hill in the south, a three-to-five-kilometer length. Most of the farm plots are located on gentle slopes while a few are on flat grounds near the river. The soil is mostly of a vertisol type but alluvial soils dominate close to the river. Small scale milk supply was the only internally filled item until ten years ago. Since then, small scale dairy farmers have been pushed out of business as they succumbed to the enormous pressure of urbanization. Instead, milk has been supplied from surrounding towns. Meanwhile, the number of household farms slightly increased in Addis Ababa over the last five years. The number of small scale farmers in Addis Ababa now

stands at 86,000. With the establishment of the Addis Ababa Urban Agriculture Commission seven months ago (AAFUADC, 2020). Urban agriculture in Addis Ababa includes not only vegetables and fruits but also animal fattening, poultry and dairy.

2.7.2. Urban agriculture land use

The agricultural activities practiced in Addis Ababa can be categorized into three main groups: Crop production, livestock rearing and mixed farming. The urban agriculture in Addis Ababa covers about 7,309 hectares. Crop production is mostly practiced in Akaki-Qality, Bole, Kolfe-keranyo and Nefas Silk Lafto sub-cities. Urban agriculture has a significant role in urban economy by providing employment, supply of wood for fuel and construction, supply vegetables and fruits to city people (AACA, 2020).

2.7.3 Urban agriculture policy and strategy

Addis Ababa has policy and strategy to guide the urban agriculture. Due to this, the expansion of population is leading to loss of highly fertile farmland and green areas losing their valuable ecosystem services. As the population of Addis Ababa is expected to reach nine million by 2035 and horizontal increase is eminent, farmland areas will continue to decline due to the urbanization and expansion in industrial development (AAFUADC , 2020). A study showed that over 70% of vegetables, 50 % of crop production and 24 % of the farmland in and surrounding Addis Ababa was lost in the short period between 2006 and 2011 (Veolia, 2019). Ministry of Agriculture establish an urban agriculture department, EIAR is currently producing several policy documents for Addis Ababa's new Urban Agriculture Commission in collaboration with the Ministry of Urban Development.

2.7.4. Urban agriculture technologies

Addis Ababa Urban agriculture can also change the consumption culture towards organic and fresh products. Beside the gaps in policy making and urban planning, comprehensive and commercialized technology supplies to boost urban agriculture in Addis Ababa are nonexistent. The authorities are also not providing proper incentives. Vertical farming is one of the fast expanding concepts in the human being's frantic efforts to reconnect modernization with organic nature (Yalew, 2020). A part of urban agriculture, which also involves rearing animals, beekeeping, forestry, aquaculture and horticulture, such a practice maximizes space usage

upward, just like buildings multiply space by building storey over storey. Vertical farms can be implemented on building-based spaces, shipping containers, deep farming and even on space crafts. The types of plant varieties used also vary based on the consumption, yield, nutrition, weather resistance, energy use, environmental conservation, ecosystem balancing and other objectives. The commission plans to use every green area, open corner, square, rooftop, restaurant, school, water pool, condominium, road, corridor, public space, institutional compound, road juncture, riverside buffer zone and every available space vertically and horizontally to produce vegetables and fruits. A revolving fund is also put aside to start providing training and loan to those who want to join the sector and A new type of extension service for urban agriculture will also kick off soon. Addis has 27 rivers that will be cleaned under the around river Park Project. Almost all of the rooftops of buildings in Addis Ababa are deserted. This is because Ethiopia, Addis Ababa city government does not have mandatory directives or incentives that make urban agriculture a component of urban architecture and construction (AAFUADC, 2020).

2.8. Conceptual framework

A conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. The conceptual frame work of this study was indicating that the immediate outcomes of urban agriculture improved food security and increase household income. The outcomes of Urban agriculture presents numerous benefits, including improved food security, economic benefits, community building, and environmental benefits. However, urban agriculture also poses significant challenges, including limited space, contaminated soil, limited access to resources, and regulatory barriers. To overcome these challenges, policymakers, urban planners, and community organizations must work together to support the development of urban agriculture. This includes providing access to land, water, and other resources, developing regulations that support urban agriculture, and investing in training and education for urban farmers. By addressing these challenges, urban agriculture can play a critical role in creating more sustainable, resilient, and equitable cities. This implies of urban agriculture practices shows improved food security. For this research, the conceptual frame work illustrated in figure 2. 1.

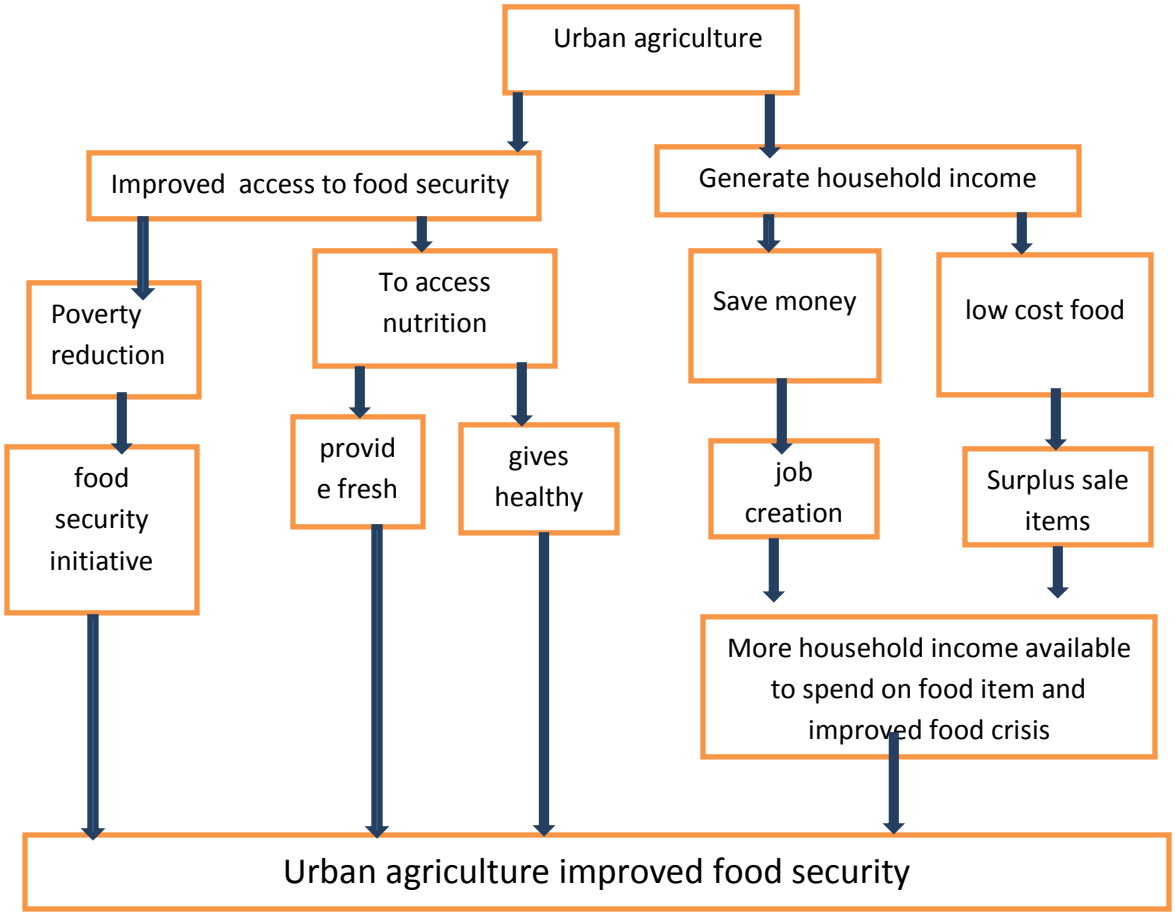


Figure 2.1Conceptual Framework

CHAPTER THREE

STUDY AREA AND RESEARCH METHODOLOGY

This chapter contains two major sections. The first section presents issues related with the description of the study area, such as location, topography, climate, drainages, soil, vegetation, and population while the second section describes the methodology which include the selection of the study sites, research design, sample size and sampling techniques, source of data, tools of data collection and methods of data analysis was incorporated.

3.1 Description of study area

3.1.1 Geographic location and size

This study was conducted in the Nifas Silk Lafto Sub-city, one of the eleven sub-cities in Addis Ababa, Ethiopia. Absolute Location of Nifas Silk Lafto Sub-city is $8^0$57 41"latitude, and $38^0$43 39" longitude (Fantahun,2016).

The sub city is which covers a land area of 5876.02 hectares and this constitutes 11.31% of the total land area of the city which makes the sub-city in 5th place in area size amongst 11 sub cities. Nifas Silk Lafto Sub-city is located in the South-West edge of Addis Ababa (Deshu, 2021). The Sub-city is bounded by Kolfe Keraniyo Sub- city in the North-West, by Bole and Akaki Kality Sub-cities in the East, by Lideta and Kirkos sub-cities in the North and Oromia regional state in the South.

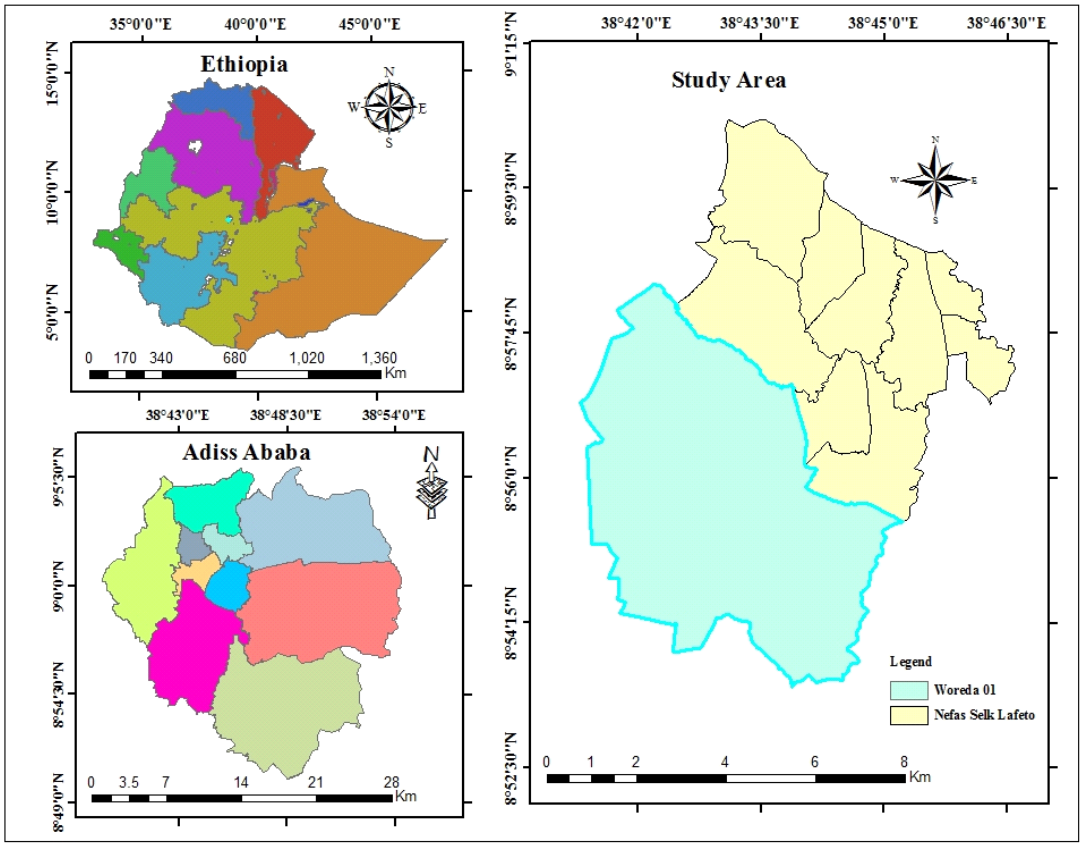


Figure 3. 1. Absolute Location of the study area

Source: Auther's computation on GIS version 10.3 and CSA data,2020

3.1.2. Climate and topographic features

Nifas Silk Lafto Sub-city is lies within the tropics, a zone of maximum insolation where the overhead sun is experienced twice in a year. The altitude ranged from 2074 to 2485 meters above sea level which has a range of 411 meters. It is characterized by moderately downslope type of topography with noticeable elevation difference landscape around river gorges in some areas (Yeselamfire, 2021). The climate condition in the area is highland, However, The daily average temperatures range from 9.9^0C to 24.6^0 C. The main rainy season, known as summer, extends from June to September, contributing about 70% of the total annual rainfall, and the mean annual rainfall is 1254 mm (Deshu, 2021).

3.1.3. Demographic characteristics

The size of a population is a very important demographic data that should be obtained within the territory of a given governing body for a number of undertakings. At present, the sub city is divided in to 12 Woredas, 128 sub Woredas. Among the 12 Woredas in Nifs Silk Lafto, the larger area is covered by Woreda 01 with 2592.83 hectares that is 44.12 % of the sub city land area. And Woreda 08 covered the smallest land area of 10.84 % of the sub city land area. The densely populated Woreda in the sub city is Woreda 04 with population density of 168.02 people/ hectare and the least densely Woreda is Woreda 01 with population density of 15.24 people/ hectare. Average of Average of 48.58 people live in each hectare area of the sub city which makes Nifa Silk Lafto the 7th densely populated sub city in Addis Ababa (AACA, 2020). Urban agriculture activities, especially vegetable production in the study area such as farming on backyard, opens spaces around houses, low-lying areas, and along river sides are wide spread (Yeselamfire,2021).

3.2. Research approach and research design

This study employed cross sectional research design with survey method. Cross –sectional studies are one type of observational study that involves data collection from a population, or a representative subset, at one specific point in time. Cross-sectional studies can be used to describe some feature of the population, or they may support inferences of cause and effect (David, 2018). The rationale behind employing cross sectional study design was that it involved data collection pertaining to role of urban agriculture in household food security, condition from a sample population or representative subset at one specific point time. Cross sectional studies are descriptive studies. In this thesis, cross sectional was employed to describe the extent of role urban agriculture in household food security in the study area. It was concerned with describing the characteristics of an event and specific predictions with narrations of facts and characteristics about a situation.

Mixed research approach the researcher uses both open ended and close ended data collection methods. Open ended question not limited the answers of individuals. Closed ended questions answers the question based on criteria. The purpose of mixed methods design is to simultaneously collect both quantitative and qualitative data, merge the data, and use the results

to understand a research problem both quantitative and qualitative data (David, 2018). A basic rationale for this design is that one data collection form supplies strengths to offset the weaknesses of the other form, and that a more complete understanding of a research problem results from collecting. In addition to this, the design allowed to explore wide range of data regarding role of urban agriculture in household food security condition which have been collected with the help of data gathering tools such as questionnaire, interview, and observation. In quantitative approaches, structured data obtained by questionnaire were categorized and computed making use of inferential statistical measures like chi-square and paired sample t-test supported by brief discussions .In qualitative approaches data gathered interview, and field observation were described and were incorporated in analysis. Results were displayed by tables, and bar graphs.

3.3 Sampling techniques

The study area of 01 Woreda has a total of 16 kebeles. Out of which three kebeles were purposively selected for this study; namely: Sefera, Contoma, and Kito Furdisa. The main reasons for the selection of these three kebeles are more practicing urban agriculture which are located peri-urban Addis Abeba district 01, Nifas-Silk-Lafto Sub-city.

Finally, the sample population was selected by using a simple random sampling technique after stratifying the urban agriculture practice into four forms, which included chicken, cereals, crop vegetation and dairy farming. In general the researcher multi-stage sampling techniques were employed to select the target population.

3.4. Population and sample size determination

According to (01 woreda municipal administrators report, 2020) the woreda has a total of 472 households who are producing cereals and vegetation fruit 463, chicken 4 and dairy farming 5 small micro enterprises. The woreda has 16 kebeles, and from these all, three kebeles, namely Sefera, Contoma, and Kito Furdisa are more practicing urban agriculture. *Sefera kebele* highly practice urban agriculture when compared to other kebeles of the 01woreda.

A total of 472 farming households have been practicing agriculture around 212, farming households would be randomly selected to respond to the questionnaire about the existing urban

agriculture for household food security problems and factors that affect access to urban agriculture's contribution to household food security. to determine the required sample size at 95% confidence level or 0.05 level of standard error, the investigator used the following formula provided by (Yemane, 1967)

$\mathbf{n}=\frac{N}{1+N(e)^2}$ Where; 'n' = is sample size

'N'= is the population size (total households)

'e'= is the level of perception (margin error). Using this technique, 212 household were determined for questionnaire-based survey.

Table 3.1 Population and sample distribution over the three kebeles

Types of urban agriculture practice	Total no household in each kebele			Sum	Total no of selected samples in each kebele				Sum
	Sefera	Contoma	Kito Furdisa		Sefera		Contoma	Kito Furdisa	
Cereal	146	131	141	418	Cereal	47	38	53	138
Vegetation and fruit	18	13	14	45	Vegetation and fruit	14	9	8	31
Chicken farming small micro enterprises	2	1	1	4	Chicken household	5	2	6	13
Milk and dries produce farming small micro enterprises	1	1	3	5	Milk, and dries household	11	5	14	30
Total	167	146	159	472		77	54	81	212

Source: Own Survey, 2022

3.4 Source of data

The investigator used both primary and secondary data sources in order to collect necessary information to this study.

Primary source: primary data was collected through survey questionnaire, Key Informant Interview (KII) and field observation.

Secondary source: To add supportive concepts and findings from the primary data, secondary data such as review of related literature, research reports, project reports, seminar papers, report and information at 01 Woreda level, institutional, official documents, and annual report from different offices. Records role urban agriculture in household food security a status of the sample kebeles were collected.

3.5 Methods of data collection

The methods of data collection depend on the nature, the objective, and the method of data analysis and the scope of the study. The availability of data, finance, time, personal and other facility also influence the selection of method to be used for the study. The main instruments of primary data collection were structured survey questionnaires, Key informants interviews and field observation was tools used in collecting primary data.

3.5.1 Questionnaire

In this study both open and close ended questionnaires were used. questionnaires to obtain relevant data from respondents, and data is collected from the selected sample's household heads in three *kebeles*. For ease of data collection during household surveys. The investigator chooses two enumerators from each kebele and provided them with brief training on how to complete the questionnaire in order to meet the study's objectives. Utilizing questionnaires, information on the demographic, socio-economic, and other like social issues topography, financial institutions, infrastructure facilities, aspects that role of urban agriculture in households food security was gathered.

3.5.2 Interviews

In this study, the investigator used semi-structured interview because of its flexibility and to make clear any time when there is ambiguity (Lankshear and Knobble, 2018). Interviews were held with key informants who were purposively selected from the community and also from different responsibility level so as to generate relevant information.

3.5.3 Field observation

Personal observations, together with photographs, were also employed in order to fully understand the realities on the ground, particularly the extent role of urban agriculture in households food security.

3.6 Method of data analysis

The data generated from primary and secondary sources through questionnaire observation key informant interview were analyzed and interpreted quantitatively and qualitatively. More ever, quantitative data collected through close ended questions were coded, categorized, summarize sorted, quantified and entered into SPSS (version 25) and analyzed by this package. Descriptive statistics like, percentage frequency Excel, and cross tabulation were emphasized with the aid of the package Social Scientists (SPSS), to analyzed the role of urban agriculture in household food security inferential statistics like correlation one way ANOVA table were used. Qualitative data gathered by open ended questionnaire, key informant interview, and field observation were also analyzed and discussed using narration method to analyze with their deep explanation concurrently with qualitative data.

3.7 Ethical consideration

In conducting this research the researcher considers the following ethical values; protect better the rights of the research participants. The principle of voluntary participation requires that people not be coerced in to participating is the requirement of in forced consent. Essentially, this means that perspective research participants had to be fully informed about the procedures and risks involved in research and had to give their consent to participate .The researcher considered not putting participants in a situation where they might to be at risk of harm in any way a result of their participation .Guarantees the participants confidentially they had been assured that identify information would have not been made available of anyone who is not directly involved in the study.

CHAPTER FOUR

RESULTS, ANALYSIS, AND INTERPRETATION

Introduction

The data analysis was classified into three basic sections; the first section summarizes and analyzes the background data of the respondents. The second section was general questionnaire analysis based on the data collected through the questionnaire, interviews, observed data, and data from documents in a combined manner by assuming that the content of the questionnaires, interviews, field observation, and secondary data have the same objectives. The analyses were presented through quantitative and qualitative data. Finally, a summary of the findings, conclusions, and recommendations was presented.

4.1. Urban agriculture, socioeconomic and demographic characteristics

4.1.1. Sex, age and marital status of households

Sex, age, and marital characteristics are among the basic information needed for human-based studies. Table 4.1 presents background information about the respondents, such as sex, and age.

Table 4. 1 Sex of the sample household heads

Variable	Category	Frequency	Percent
Sex	Male	119	56
	Female	93	44
	Total	212	100

Source: Own survey, 2022

The sex compositions of the respondents, as indicated in Table 4.1, were as follows: 56% of the respondent households were male-headed, while the remaining (44%) household heads were females. This clearly shows there is a sex difference in urban agriculture practice.

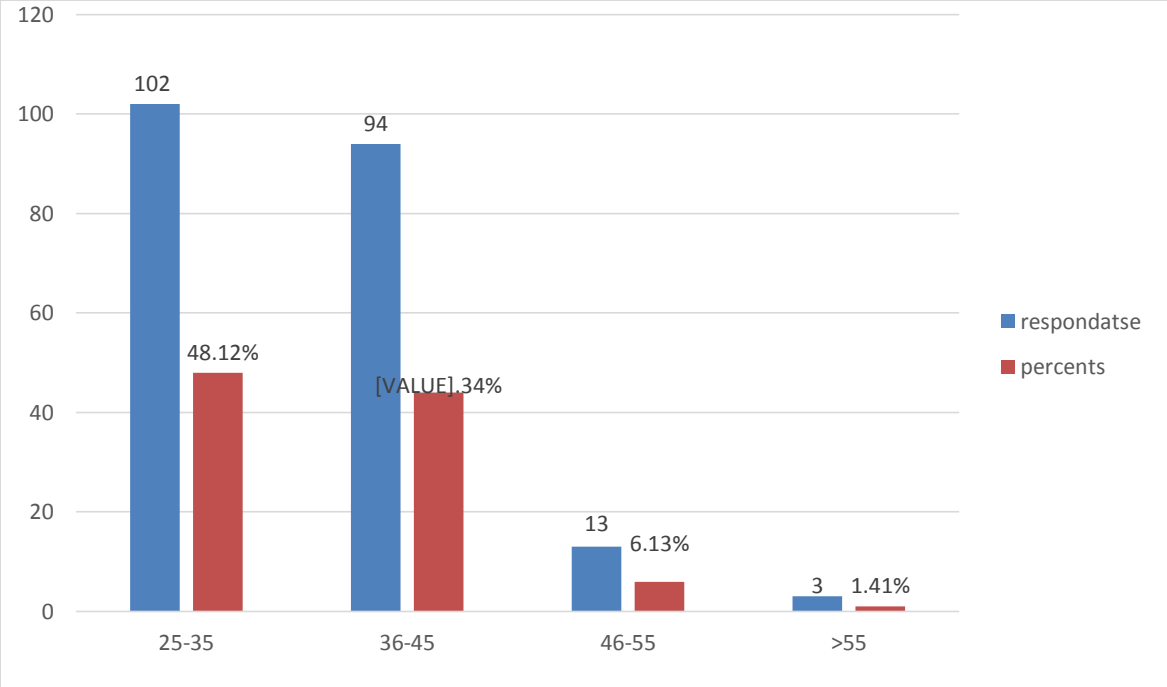


Figure 4.1. Age respondents of the study area
Source: Own survey, 2022

The majority of urban agriculture households (48.12%) were between the ages of 25 and 35. Thus, the adult group dominated the activity in the study area and food was secured. On the other hand, the proportion of the urban agriculture household is 44.34% aged between 36–45 years, about 6.13% between 46–55 years, and above the age of 56(1.41%) years, the household participates in urban agriculture activity.

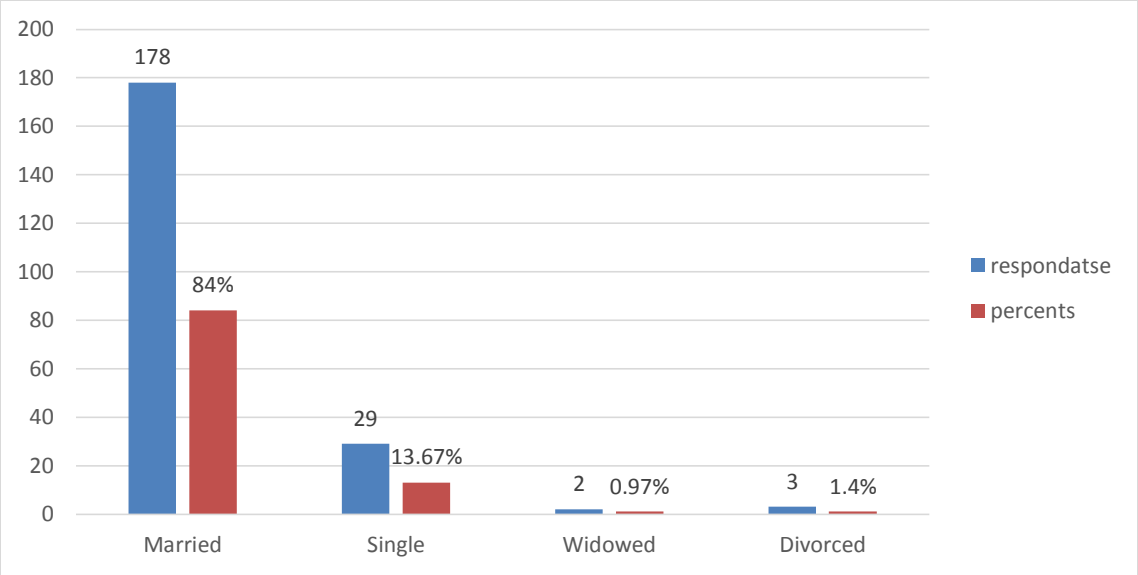


Figure 4. 1 Marital status of the study area
Source: Own survey, 2022

As a result, a large proportion of the participants are married households, which accounted for about 178(84 %). The remaining 29 (13.67%), 2 (0.97%), and 1.4% of those asked were single, divorced, or widowed. This result showed that the majority of the respondents for this study were married.

4.2 Educational status of the households

Education is important to engage different sectors without adequate or sufficient skills the works will not be successful. So having good skills are helps and achieve any kinds of activities.

Table 4.2. Educational status of the households

Variable	Response type	Respondents	Percent
Educational level	Not read and write	91	42.92
	Read and write	63	29.7
Grade 0-8	Elementary level	32	15.09
Grade 9-12	Secondary	18	8.49
Level I,- IV.	College and diploma	5	2.35
University	Degree and above	3	1.41
	Total	212	100

Source: Own Survey, 2022

Table 4.2 showed that the educational background of the households whose data is urban agriculture, as a result,42.92% are those who can not read and write, about 29.7% can read and write, 15.09%, 8.49%, and 2.35 have attended elementary, secondary, and college education respectively. The remaining 1.41% were households that had a degree or above. The result clearly shows that the majority of the respondents were not read and write. stated that in order to expand the practicing urban agriculture must be enhancing the knowledge of farmers was required skills of urban agriculture.

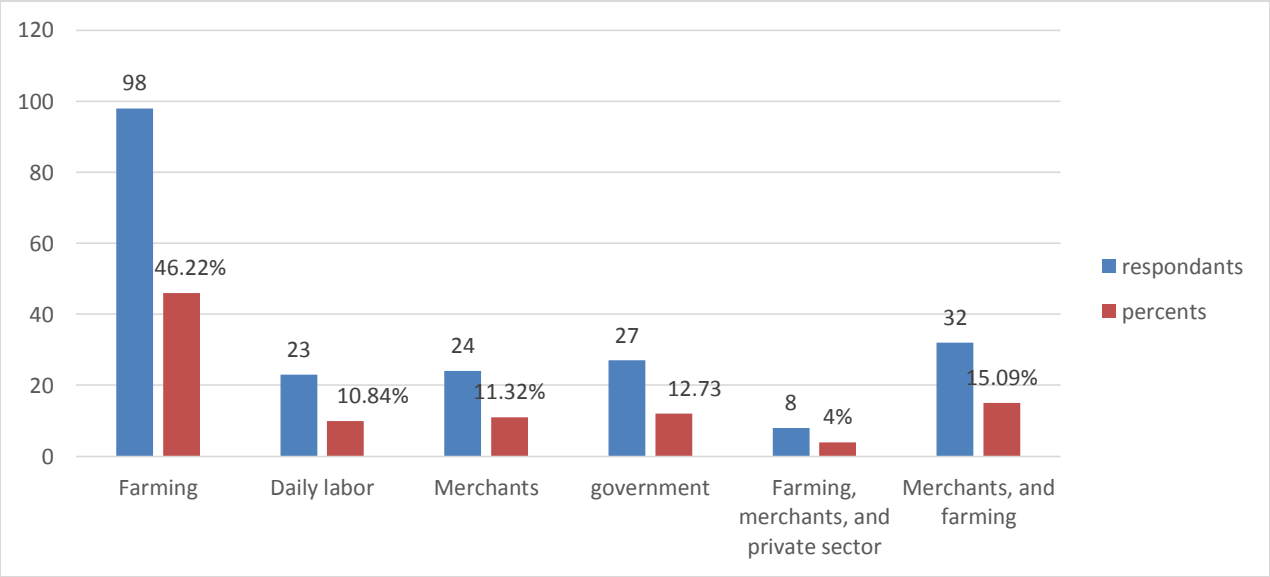


Figure 4.3 Occupational situation household
Source: Own survey,2022

Figure 4.3 also showed the occupational structure of urban agriculture household heads covered by the survey, (46.22%) of the farming, were government employers (12.73%), about 11.32% as merchants, 10.84% daily labor, 15.09% merchants, and farmer, and 4% were farmer, private sector, and merchants. Hence, it is evident that the urban agricultural households were from diverse occupations.

4.3 Awareness of administrators about the role of urban agriculture

This section analyzed about awareness of administrators about the role of urban agriculture. In urban areas there are different stakeholders or careers that have skills in different work categories or specialization.

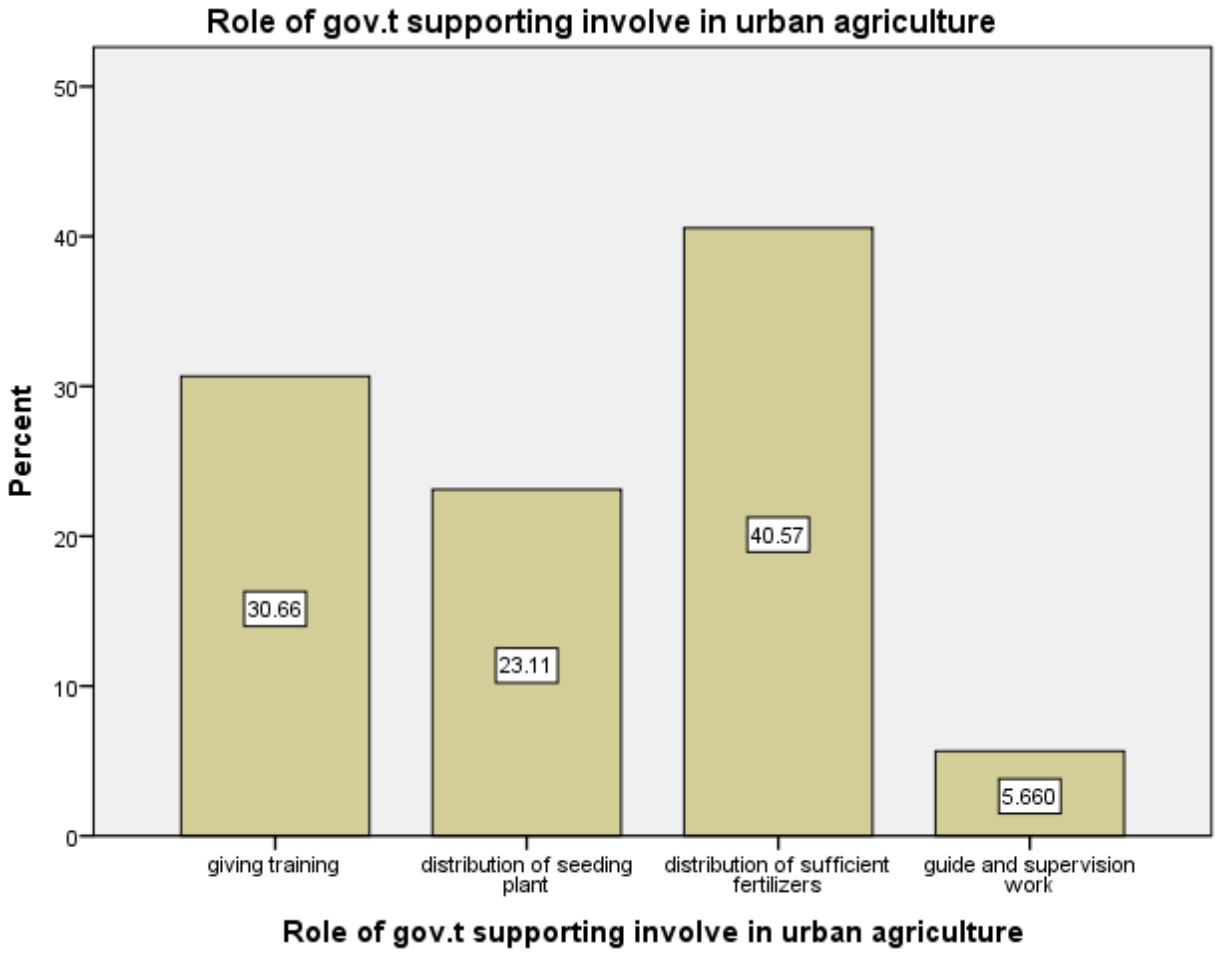


Figure 4. 2 role of gov.t supporting involve in urban agriculture

Source: Own survey,22

According to figure 4.4, approximately 30.7% of respondents described the role of the government, and the government has provided training for farmers who practice urban agriculture. While 40.6%, 23.1%, and 5.7% of respondents said the role of government was to distribute sufficient fertilizers, seeding plants, and guide and supervise work, respectively. This implies the government's role in ensuring adequate fertilizer distribution.

Table 4. 3 Awareness of administrators about the role of urban agriculture

Variable	Respondents	Frequency	Percent
Do urban agricultural management workers create awareness about food security	Yes	115	54.2
	No	97	45.8
	Total	212	100.0
Does the urban agriculture management staff create awareness of the benefits of urban agriculture to those who work in the urban agriculture sector as well as to the society?	Yes	117	55.2
	No	95	44.8
	Total	212	100.0
Is there any awareness given to the public by urban agriculture management staff regarding the recycling of urban waste?	Yes	155	73.1
	No	57	26.9
	Total	212	100.0

Source: Own Survey, 2022

According to Table 4.3 Concerning food security, around 54.2% of the participants said "yes" which means urban agricultural management workers create awareness about food security while, 45.8% of the participants said "no" this urban agricultural management workers did not create awareness about food security. Furthermore the urban agriculture management staff creates awareness of the benefits of urban agriculture to those who work in the urban agriculture sector as well as to the society and there was awareness given to the public by urban agriculture management staff regarding the recycling of urban waste. The above data results indicate that agricultural management workers create awareness about urban agriculture and food security.

4.4 The challenges and opportunities for households who are practicing urban agriculture

4.4.1 Challenge for household who are practicing urban agriculture

Under this, the researcher analyzed the challenges and opportunities of urban agriculture are; lack of access to credit, shortage of inputs, land granting system, lack of technical support from concerned bodies/less contact with agricultural sectors, planting of non-edible trees, lack of enough space/land shortage for cultivation, disease and environmental contamination, problem of market are the major challenges of farming practices in the area (FAO, 2022).

Table 4.4 Challenges of urban agriculture

Descriptive statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Do the urban people have the needed skills and educational preparation to work in urban agriculture in city?	212	1.00	2.00	1.7547	.43127	-1.192	.167
population pressure	212	1.00	2.00	1.2217	.41637	1.350	.167
Do you have enough money to work in urban agriculture	212	1.00	2.00	1.5896	.49307	-.367	.167
Mismanagement of land use	212	1.00	2.00	1.7123	.45378	-.944	.167
Do you have interest to work in urban agriculture?	212	1.00	2.00	1.5708	.49614	-.288	.167
Valid N	212						

Source: analysis via SPSS-version 21, 2021(Note: SD=Standard Deviation)

"Table 4.4 showed that respondents were asked about education, and around**"** result of the SPSS analysis showed that the **minimum** & the **maximum** urban people did not need skills and educational preparation to work in urban agriculture in the city of respondents were 1 and 2 respectively; and the **mean** (average) urban people did not need skills and educational preparation to work in urban agriculture in the city of the respondents was 1.754. Again, value of the standard deviation is equal to 0.43 means that the standard/mean variation (or difference) in education between the total respondent (i.e. 212) was 0.43.

On the other hand, the **"statistics"** value of education under the **"skewness"** column (i.e. the value in the 2nd column from the last) is equal to -1.192; and this value (-1.192) indicates that the respondents were characterized by a **"negatively skewed"** education distribution; in other words, this means that the mean education of the respondents was less than the median and modal education of the sample respondents. Note that a distribution is said to be **"negatively skewed**" if its **Mean < Median < Mode;** but, the distribution is said to be **"positively skewed**" if its **Mean > Median > Mode.**

Finally, you have to notice that the values of the other variables would be interpreted in a similar fashion with the one carried out for **"education of respondents."**

4.5 Inferential statistics

This section of the study deals with inferential statistics. Some of the inferential statistics used in this study were correlation and regression. The data obtained from field survey presented as follows.

4.5.1 Correlation analysis

The study sought to establish the relationship between independent variables and dependent variables. Pearson Correlation analysis was used to achieve this end at 95% confidence level (α = 0.05). Correlation analysis is one of the most widely used in research. It is often used to determine a relationship between two different variables, if so how significant or how strong is the association between variables. And also a very useful means to summarize these relationships between the variables with a single number that falls between -1 and +1 Field (2005). Correlation analysis with Pearson´s correlation coefficient (r) was conducted on all variables in this study to explore the relationships between them. The correlation coefficient r is statistics used to measure the degree or strength of this type of relationship (Taylor, 1990).

To interpret the strengths of relationships between variables, the guidelines suggested by Taylor R (1990), was followed. His classification of the correlation efficient (r) is as follows:$\leq$ 0.35 is considered to represent low or weak correlation; 0.36 – 0.67 is modest or moderate correlation; 0.68-0.89 is strong or high correlation and a correlation with r coefficient $\geq$0.90 is a very high correlation. Again if the correlation result lies between -1 and 0, the two variables are negatively related.

Table 4.5 challenges of households who are practicing urban agriculture

Correlations					
		Urban agriculture. improved food security	Do you have enough money to work in urban agriculture	Mismanagement of land use	population pressure
Urban agriculture. Improved food security	Pearson Correlation	1	.402**	.307**	.904**
	Sig. (2-tailed)		.000	.000	.000
	N	212	212	212	212
Do you have enough money to work in urban agriculture	Pearson Correlation	.402**	1	.762**	.445**
	Sig. (2-tailed)	.000		.000	.000
	N	212	212	212	212
Mismanagement of land use	Pearson Correlation	.307**	.762**	1	.339**
	Sig. (2-tailed)	.000	.000		.000
	N	212	212	212	212
population pressure	Pearson Correlation	.904**	.445**	.339**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	212	212	212	212

**. Correlation is significant at the 0.01 level (2-tailed).

Source: own survey, 2022

Table 4.5 showed that urban agriculture is positively correlated with dependent variable money and the relationship between variable is moderate correlation. With 0.402. Moreover, urban agriculture is significant with the value of .000 which is less than 0.05. Hence, urban agriculture have positive and statistically significant relationship between urban agriculture and money.

Mismanagement of land use is positively correlated with dependent variable money and the relationship between variable is very high correlation. Correlation with the value of 0.762. in addition to mismanagement of land use is statistically significance with value of .000 which is less than 0.05.thus, mismanagement land use have positive and statistical significant relationship between land use and money.

Population pressure is positively correlated with dependent variable money and the relationship between variables is modest or moderate with the value of 0.445 likewise population pressure is statistically significant with the value of .000 which is less 0.05.Therefore have positive and statistical significant relationship between land use and money.

Table 4.6 Opportunities of governmental policy who are practicing urban agriculture

Correlations					
		linkage of food security and urban agriculture	An organization that gives credit for urban agriculture	The absence of inadequate urban agriculture institution negatively impact on food security urban area?	Inadequate urban agriculture policy affects insufficient food security in urban area?
linkage of food security and urban agriculture	Pearson Correlation	1	.027	-.027	.079
	Sig. (2-tailed)		.700	.692	.253
	N	212	212	212	212
an organization that gives credit for urban agriculture	Pearson Correlation	.027	1	-.072	.022
	Sig. (2-tailed)	.700		.295	.751
	N	212	212	212	212
The absence of inadequate urban agriculture institution negatively impact on food security urban area?	Pearson Correlation	-.027	-.072	1	.121
	Sig. (2-tailed)	.692	.295		.080
	N	212	212	212	212
. Inadequate urban agriculture policy affect insufficient food security in urban area?	Pearson Correlation	.079	.022	.121	1
	Sig. (2-tailed)	.253	.751	.080	
	N	212	212	212	212

Table 4.6 showed that linkage of food security and urban agriculture is positively correlated with dependent variable an organization that gives credit for urban agriculture and the relationship between variable is weak correlation. With 0.027. Moreover, linkage of food security and urban agriculture is significant with the value of 0.700 which is greater than 0.05. Hence, linkage of urban agriculture have positive and statistically significant relationship between linkage of food security and urban agriculture and organization that gives credit for urban agriculture.

Inadequate institution is positively correlated with dependent variable an organization that gives credit and the relationship between variable is negative correlation. Correlation with the value of -0.027. in addition to inadequate institution is statistically significance with value of .295 which

is greater than 0.05.thus, and inadequate institution statistical significant relationship between inadequate institution and an organization gives credit.

Policy affect insufficient food security is positively correlated with dependent variable an organization that gives credit and the relationship between variables is weak correlation with the value of 0.022 likewise Policy affect insufficient food security is statistically significant with the value of .751 which is greater than 0.05. Therefore have positive and statistical significant relationship between Policy affect insufficient food security and an organization that gives credit

Table 4.7 **Challenges and opportunities for households who are practicing urban agriculture**

ANOVA table

		Sum of Squares	Df	Mean Square	F	Sig.
There is sufficient food in city to be exploited by urban agriculture	Between Groups	3.651	4	.913	.599	.664
	Within Groups	315.462	207	1.524		
	Total	319.113	211			
Inadequate urban agriculture policy affect insufficient food security in urban area?	Between Groups	.993	4	.248	.810	.520
	Within Groups	63.474	207	.307		
	Total	64.467	211			
what are the reason for food insecurity in urban area?	Between Groups	2.797	4	.699	.911	.458
	Within Groups	158.882	207	.768		
	Total	161.679	211			

Source: own survey, 2022

The above test result leads to the rejection of the null hypothesis for the urban agriculture (because the significance value 0.458 is greater than 0.05), but the null hypothesis should be accepted for the sufficient food in city (because the significance value 0.520 is greater than 0.05). There is sufficient food in city to be exploited by urban agriculture significant value 0.664 is greater than 0.05. Thus, there is sufficient food in city to be exploited by urban in any group or association is significantly food security.

The positive Phi value of the systematic measures indicates the reason for food insecurity in urban area, Inadequate urban agriculture policy, and there is sufficient food in city to be exploited by urban agriculture a membership in any group or associations has a positive relationship with food security.

Table 4.8 Omnibus tests of model coefficients

Omnibus tests of model coefficients				
		Chi-square	df	Sig.
Step 1	Step	54.747	5	.000
	Block	54.747	5	.000
	Model	54.747	5	.000

Table 4.8 showed that omnibus Test of model coefficients. Regarding to this, the model chi-square was 54.747 with 5 degrees of freedom which is greater than the usual statistical significant value of 0.05. The calculated statistical significant value was .000 which is less than 0.05. This implies that the model is significant.

Table 4.9 Model summery

Model summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	150.597[a]	.228	.367
a. Estimation terminated at iteration number 6 because maximum iterations has been reached. Final solution cannot be found.			

Table 4.9 model summery. With this regards, -2 Log likelihood was 150.597, Cox & Snell R Square value was 0.228 and Nagelkerke R Square was 0.367 Hence, the dependent variable urban agriculture is explained by independent variables (education preparation, mismanagement land use, money, and population pressure) in this study .

Table 4.10 Binary logistic regression analysis

Variables in the equation							
		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	Education preparation	.000	14510.831	.000	1	1.000	1.000
	Mismanagement land use	.000	15544.484	.000	1	1.000	1.000
	Money	.000	9101.915	.000	1	1.000	1.000
	Population pressure	22.946	4550.958	.000	1	.996	9231285104.211
	Constant	-44.149	11147.525	.000	1	.997	.000
a. Variable(s) entered on step 1: education preparation, mismanagement land use, money, population pressure							

Table 4.10 showed that binary logistic regression, from the findings regression equation becomes:

$Y = -44.149 + 0.000\ X_1 + 0.000\ X_2 + 0.000\ X_3 + 22.946$

From the model, when other independent variable (education preparation, mismanagement land use, money, and population pressure) becomes -44.149. Holding other independent variables (education preparation, mismanagement land use, money, and population pressure) is constant, a unit increase in education preparation would lead to 0.000 increase influencing urban agriculture. A unit increase of mismanagement land use would lead to 0.000 increase urban agriculture. A unit increase of money would lead to 0.000 increases influencing urban agriculture. A unit increase influence population pressure would lead to 22.149.

From the above information it is possible to infer that the first factors that influence to urban agriculture to population pressure. The second factor are education preparation. Mismanagement land use, and money.

4.5.2 Infrastructure and food insecurity in urban area

4.5.3 Infrastructure

This section would analyze infrastructure and food insecurity in urban areas. Infrastructure is important for the countries from rural and urban areas in order to fight poverty reduction which common enemies. On the other hand, infrastructure is a pillar to link urban and rural areas. Then they exchange different varieties of crops through infrastructure. Urban physical infrastructure (UPI) is one of the major assets of a city in terms of capital investment, critical service provisioning, and sustainable and resilient urban development. UPI includes physical objects like roads, sewerage, and energy networks**.**

When the respondents were asked about the condition of infrastructure in the study area, 134 (63.2%) reported that there was adequate infrastructure to work in urban agriculture. The remaining 11 (5.18%), 12(5.66%), 19 (8.96%), and 36(16.98%) of the respondents said neutral, strong disagree, disagree, and strong agree respectively. This implies that adequate infrastructure was available to work in urban agriculture (see table 4,11)

Concerning transport, about 68(32.7%) of the respondents disagreed. This means that they couldn't get transport at any time while the rest, 25.94%, 23.11%, 10.84%, and 8.01% of the respondents replied neutral, agree, strongly disagree, and strongly agree, respectively. On the other hand, the respondents were asked about whether they could get transport to any place. The

majority of the respondents replied that they did not agree, which means they did not get transport to anywhere. Thus, the above data showed that the majority of the respondents suffered from poor access to transport services, because there were no adequate transport systems (see table 4.11).

Table 4.11 Infrastructure and food insecurity in urban area

Variables	Degree of agreement					
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Total
There is adequate infrastructure to work in urban agriculture?	36	134	11	19	12	212
Percent	16.98	63.2	5.1 8	8.96	5.66	100
Do you get transport at any place?	17	51	56	62	26	212
Percent	8.01	24.05	26.41	29.24	12.26	100
Do you get transport at any time?	17	49	55	68	23	212
Percent	8.01	23.11	25.94	32.07	10.84	100

Source: Own Survey, 2022.

4.5.4 Food insecurity in urban area

The respondents were asked about the reasons for food insecurity in urban areas. Of these, individuals 102(48.11%) of the respondents replied that the reason for food insecurity in urban areas was rapid growth of the population, while the remaining 48 (22.64%), and 5(2.35%) of the respondents replied that weak land policy, and lack of training for households, respectively. It is possible to conclude that the major reasons for food insecurity in urban areas were a lack of appropriate institutions, weak land policy, and lack of training for households (see table 4.12).

Table 4. 12 Food insecurity in urban area

Variables	Respondents	Percent
Rapid growth of population	102	48.11
Weak land policy	48	22.64
Lack of training for household	5	2.35
Total	212	100

Source: Own Survey, 2022.

4.6 Cultivated land and farming system

This section's analysis is about cultivated land and farming systems. Cultivated land and farming systems are essential for agriculture in order to grow different types of crops. Regarding cultivated land, about 186(87.73%) of the respondents said "yes," which means they had their own cultivated land, while the rest, 26 of the respondents said "no." This means they did not own cultivated land. This result shows that most of the respondents had their own cultivated land.(see table 4.13).

Table 4.13 Cultivated land and farming system

Variables	Response type	Frequency	Percent
Do you have your own cultivated land?	Yes	186	87.73
	No	26	12.26
	Total	212	100
Do have irrigation farm land?	Yes	6	2.83
	No	206	97.16
	Total	212	100

Source: Own Survey, 2022

4.7 Crop production

Crop production is the process of growing crops for domestic and commercial purposes. Fertilizer is necessary to maintain global crop productivity at current levels and will become even more crucial (Singh, 2019). About 138(65.09%) of the respondents said "yes," which means farmers were using fertilizers. The rest of the respondents said "no." This means they had not used fertilizer. Thus, much of the farmers use fertilizers for their crops.

Regarding commercial or selling crops, around 114(53.77%) of the participants said "yes." This means the farmers produce a crop for selling while the rest of 98 (46.22%) of the respondents said "no," which means they had not produced a crop for selling. This result showed that most of the farmers produced crops for sale (See table 4.14).

Table 4.14 Crop production

Variables	Response type	Frequency	Percent
Do the farmers use fertilizer?	Yes	138	65.09
	No	74	34.9
	Total	212	100
Do the farmers produce crop for selling?	Yes	114	53.77
	No	98	46.22
	Total	212	100

Source: Own Survey data, 2022.

4.8 Types of urban agriculture and market

This section deals with the types of urban agriculture and markets. In urban areas, there are different types of agriculture. Farmers sow or plant different crops. When the crops are harvested, they market what is left over from their own consumption.

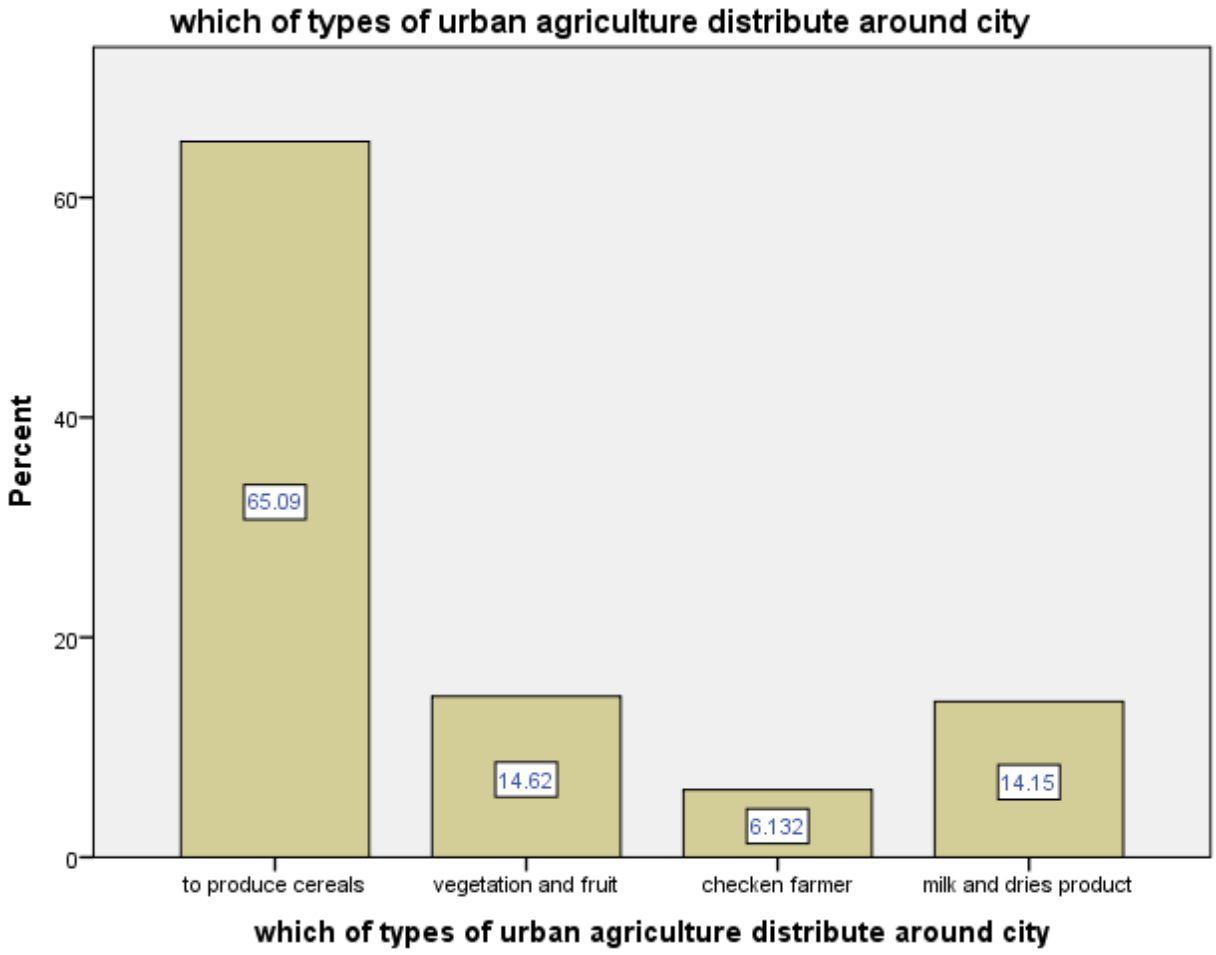


Figure 4.5 Types of Urban Agriculture and Market.

Source: own survey, 2022

According to figure 4.5 about 138 (65, 09%) of respondents were engaged in cereal production, while the remaining 31 (14.62%), 30 (14.15%), and 13 (6.13%) were engaged in vegetables and fruit, milk and dried products, and chicken production, respectively. Thus, the data indicated that the majority of the respondents were engaged in producing cereals.

Regarding the market, 129 (60.84%) of the respondents Two quintals per month, three quintals per month, and above, four quintals per month, were provided to the market by the remaining 50 (23.58%), 22 (10.37%), and 11 (5.18%) of the respondents, respectively. Thus, the data revealed that there was very little that they could offer to the market. (See table 4.15).

Table 4.15 how many quintals do you provide to the market monthly

Variables	Response	Frequency	Percent
How many quintals do you provide to the market monthly?	One quintal Kg/monthly	129	60.84
	Two quintal Kg/monthly	50	23.58
	Three quintal Kg/monthly	22	10.37
	Above four quintal kg/monthly	11	5.18
Total		212	100

Source: Own Survey, 2022

4.9 The Impact of Urban Agriculture on Food Security

The respondents were asked whether there was sufficient food in the city to be exploited by urban agriculture. The data gathered shows that 87(41.03%) of the participants reported disagreeing, which means there was not sufficient food in the city to be exploited by urban agriculture. While the remaining 6 (2.8%), 22 (10.37%), 23 (10.08%), and 74 (34.9%) strongly agree, neutrally agree, and strongly disagree. Thus, the data revealed that there was insufficient food in the city to be exploited by urban agriculture (see table 4.16).

Credit is crucial in the agricultural sector to enhance the productivity of crops and animals used as food for human beings (Akmal et al. 2012). Farmers usually obtain low crop production due to a lack of capital, and credit is a capital alternative to enhance productivity in developing countries. Of these, 77(36.325%) of the respondents disagreed that there was an organization that gives credit for urban agriculture activities. The responses of the remaining 54(25.47%), 32(15.09%), 26 (12.26%), and 23 (10.08%) of the participants were strongly agree, neutral, agree, and strongly disagree, respectively. Thus, the data showed that there was not an organization that gives credit for urban agriculture activities (see table 4.16).

Table 4.3 impacts of urban agriculture on food security

Variables	Degree of agreement	Frequency	Percent
There is sufficient food in city to be exploited by urban agriculture	Strongly agree	6	2.8
	Agree	23	10.8
	Neural	74	34.9
	Disagree	87	41.03
	Strongly disagree	22	10.37
	Total	212	100
There is an organization that gives credit for urban agriculture activities	Strongly agree	54	25.47
	Agree	32	36.32
	Neural	26	12.26
	Disagree	77	15.09
	Strongly disagree	23	10.08
	Total	212	100

Source: Own Survey data, 2022

Table 4.4 the impact of urban agriculture on food security

Variables	Degree of agreement	Frequency	Percent
The absence of inadequate urban agriculture institution negatively impact on food security urban area?	Strongly agree	121	57.07
	Agree	68	32.07
	Disagree	22	10.37
	Strongly disagree	1	0.47%
	Total	212	100
Inadequate urban agriculture policy affects insufficient food security in urban area?	Strongly agree	49	23.11%
	Agree	93	43.86%
	Neutral	19	8.96%
	disagree	51	24.05%
	strongly disagree	0	
	Total	212	100

Source: Own Survey data, 2022

Table 4.3 showed that the impact of urban agriculture on food security, around 121(57.07%) of the respondents replied that they strongly agree, which means there was an absence of inadequate urban agriculture institutions negatively impacted on food security in urban areas, while the rest 68(32.07%), 22 (10.37%), and 1(0.47%) of the respondents replied that they agree, agree, and strongly disagree. This result showed that there was an absence of inadequate urban agriculture institutions negatively impacting on food security in urban areas.

Regarding policy, around 93(43.86%) of the respondents replied that they they agree, which means there was an Inadequate urban agriculture policy affects insufficient food security in urban area, while the rest 49(23.11%), 19 (8.96%), and 51(24.05%) of the respondents replied that they strongly agree, neutral, and disagree. This result showed that there was Inadequate urban agriculture policy affects insufficient food security in urban area.

CHAPTER FIVE

5. **Summary**, **Conclusion and Recommendation**

5.1 Summary

This study was conducted in peri-urban Addis Ababa; district 01, Nifas-Silk-Lafto Sub-city. The main objective of the study was to investigate the role of urban agriculture in household food security in peri-urban Addis Ababa: a case study of district 01, Nifas-Silk-Lafto Sub-city.

The study has made use of both primary and secondary data sources. The total population of the study area was 472 households. Of these, 212 sample households were selected through multi stage sampling, and the data was analyzed by making use of descriptive and qualitative method.

56% of the respondent households were male-headed, while the remaining 44% of household heads were female. This clearly shows there was a gender difference in urban agriculture practice. The majority of urban agriculture households (48.58%) were between the ages of 31 and 45. A large proportion of the participants were married households, which accounted for about 178(84%). The majority (42.92%) of the household were not read and write. The urban agricultural households are from diverse occupations. The majorities of people do not have the expected skills and had not received formal training to work in urban agriculture. Money was the biggest challenge to engaging in urban agriculture. In addition to this, lack of capital was the one of the challenge to engage urban agriculture. Due to the absence of land and money, the respondents were not interested in engaging in urban agriculture. There was no mismanagement of land in the study areas where the households were using their land properly or effectively. The increasing numbers of people in urban areas is one of the challenges for urban agriculture. This means urban agriculture will disappear as a result of population increases because the farm land would be converted to residential area. Therefore, population growth is a major challenge for urban agriculture. They have *lacke*d appropriate institutions. This led to urban agriculture's becoming weak.

Urban agriculture proved to play a significant *role* in improving household food *security* and income. Urban agriculture offers an opportunity for food security among households, and urban agriculture has the potential to minimize food insecurity.

Infrastructure is a pillar that links urban and rural areas. Then they exchange different varieties of crops through infrastructure. About 92.5% of the communities were affected by the poorly developed physical infrastructure. In the study area, the majority of the respondents suffered from lack of adequate transport systems.

The major reasons for food insecurity in urban areas were a lack of appropriate institutions, weak land policy, and a lack of training for households. One interviewee reported that the main reasons for not ensuring food security in the city were a lack of attention to urban agriculture, a lack of a strong agricultural policy, a lack of uniformity in agriculture, and high migration from rural to urban areas.

Cultivated land and farming systems are essential for agriculture in order to grow different types of crops. Regarding cultivated land, about 87.73% of the respondents said "yes," which means they had their own cultivated land. Fertilizers were widely used by farmers in the study areas. Most of the farmers produced crops for sale. The majority of the respondents were engaged in producing cereals. There were very few agricultural products that farmers in the study areas were able to offer to the market. Inadequate urban agriculture policy affects insufficient food security in urban area, while the rest 49(23.11%), 19 (8.96%), and 51(24.05%) of the respondents replied that they strongly agree, neutral, and disagree. This result showed that there was Inadequate urban agriculture policy affects insufficient food security in urban area.

5.2 Conclusion

The study has roles of urban agriculture in household food security in peri-urban Addis Ababa and identified the major contribution of urban agriculture in household and food security status of the farmers. The major findings of the study are stated as follows:

Study found that urban agriculture plays an important role in improving household food security in peri-urban Addis Ababa. Result of respondents showed that sex, age, martial states, education background of household own roles involves of urban agriculture. The majority of the respondents believed urban agriculture has the potential to minimize food insecurity. However, the study also identified several challenges faced by households engaged in urban agriculture, including a lack of credit services, related to land policy, lack of modern technology, shortage of input farming product, money, and Mismanagement of land use, as well as an increasing number

of people in urban areas and the absence of adequate transport systems. To address these challenges, it is important to consider implementing policies and programs that provide access to credit services and financial resources for urban agriculture. Additionally, measures to address land available and transportation shortages can help improve the conditions for urban agriculture in peri-urban areas. Furthermore, promoting sustainable urban agriculture practices and providing support for technology adoption and access to inputs can also help address the challenges faced by households engaged in urban agriculture.

5.3 Recommendation

The roles of urban agriculture for the producers, consumers, urban household, and environment in general is so many that there is a find to understand about those in the activity, the situation of the farms, the role they play and the challenges they face. Hence, such a study can provide variances input to conduct the challenges by those involved in it and to improves sustainable urban development. Accordingly, governmental, non-governmental and society based organizations could use the findings of the study to take measures to achieve their goals of bringing about sustainable urban development. Therefore based on the findings and conclusions of the study, the following recommendations could be forwarded:

- This study shows that most of the respondent uneducated. Due to their lack of education, farmers in urban agriculture generally have little knowledge about agriculture, so there is very little they can offer the market. Therefore, in order for urban agriculture to grow, farmers should be given short training on agricultural practices by people who have knowledge about urban agriculture or agricultural experts, and they should be taught about agriculture.

- Most of the participants in this study had the desire to participate in urban agriculture, but a lack of funds prevented them from doing so. Participants must be encouraged to self initiate solutions within their individual areas of responsibility, rather than seeking unanimous agreement. Sector UA participant groups, including private companies involved in distribution to and from UA participants, should be encouraged.

- Therefore, they should be encouraged by giving financial assistance and loans in consultation with the concerned parties. Seeking and incentivising joint funding and

contributions from other parties, for example from large business interests, to support seed funding, networking, training, marketing and research

- Infrastructural problems should be fixed since most of society is suffering from infrastructural problems. Additionally, measures to address land availability and transportation issues can help improve the conditions for urban agriculture in peri-urban areas. Furthermore, promoting sustainable urban agriculture practices and providing support for technology adoption and access to inputs can also help address the challenges faced by households engaged in urban agriculture
- In relation to urban agriculture, if different strong groups are established, that is, the established groups should be able to provide practical training about agriculture and give awareness.
- Considerations of land access and tenure, water supply and market accessibility are critical and need to be factored into support mechanisms.
- Strong policies on agriculture should be made and the policies should be implemented. To address these challenges, it is important to consider implementing policies and programs that provide access to credit services and financial resources for urban farmers.
- To develop modern farming technology for urban agriculture can help improve productivity and efficiency, and address some of the challenges faced by urban farmers. By adopting modern farming technology, reduce their environmental impact, and improve their economic viability.

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Appendix I

Addis Ababa University

College of Social Sciences

Department of Geography and Environmental Studies

Stream: Urban and Regional Development Planning

Section 1 Introduction

Dear respondents,

My name is Elias Tefera. I am studying Urban and Regional Development Planning at Addis Ababa University, College of Social Sciences, in the Department of Geography and Environmental Studies. Hence, I am now preparing my thesis that deals with t**he role of urban agriculture in household food security in peri-urban Addis Ababa: a case study of district 01 Nifas-Silk-Lafto Sub-city,** to be submitted to the department of Geography and environmental studies in partial fulfillment of the requirement for the degree of Master of Arts in urban and regional development planning. The purpose of this questionnaire is to gather information about **the role of urban agriculture in household food security in peri-urban areas** from you, the respondents. The information collected will be used only for the given academic purpose.

General guidelines

- Do not write your name.
- You are kindly asked to give real or accurate responses.
- Please circle the correct answer.
- If the questions are unclear or not understandable, you can ask the data collector or the researcher.
- Please answer all questions.

Section 2 Background of the Respondents

1. Sex 1. Male 2. Female
2. Age 1. 18-30 2. 31-45 3. 46-60 4. above 60
3. Household size 1. 1-4 2.5-10 3.>10
4. Marital status 1. Mired 2. Single 3 .widowed 4.Divorced
5. Educational level 1. Illiterate 2. Read and write 3. Elementary level 4. Secondary 5. College and diploma 6. Degree and above
6. Occupation of household 1. Farming 2. Daily labor 3. Government 4. Private sector 5. Merchant

Section 3 Awareness of Administrators about the Role of Urban Agriculture

1. Role of gov.t supporting involve in urban agriculture
2. Do you reuse animals and other wastages for U.A purpose?
3. Do you think U.A increases with job opportunities increases?
4. Do urban agriculture management workers create awareness about food security
5. Does the urban agriculture management staff create awareness about the benefits of urban agriculture?
6. Does the urban agriculture management staff create awareness of the benefits of urban agriculture to those who work in the urban agriculture sector as well as to the society?
7. Is there any awareness given to the public by urban agriculture management staff regarding the recycling of urban waste?

Section 4

Challenges of Urban Agriculture

1. Do the urban people have the needed skills and educational preparation to work in urban agriculture in city?	1.Yes 2.No
2. Do you have enough money to work in urban agriculture?	1.Yes 2.No
3. Do you have interest to work in urban agriculture?	1.Yes 2.No
4. Mismanagement of land use	1.Yes 2.No
5. In appropriates urban land planning	1.Yes 2.No
6. population pressure	1.Yes 2.No
7. lack of appropriate institutions	1.Yes 2.No

Section 5

Opportunities for Households Who Are Practicing Urban Agriculture

1. Do the urban agriculture sectors play in food security?	1.Yes
	2.No
2. Do the urban agriculture offer opportunity for food security among household?	1.Yes
	2.No
3. Does the urban agriculture have potential to minimize food insecurity?	1.Yes
	2.No
4. Does the urban agriculture improve household food security?	1.Yes
	2.No
5. Do the urban agriculture opportunity for landless peoples?	1.Yes
	2.No

Section 6 Infrastructure and food insecurity in urban Area

Variables	Degree of agreement				
	Strong agree	Agree	Neutral	Disagree	Strong disagree
There is adequate infrastructure to work in urban agriculture?					
Do you get transport at any place?					
Do you get transport at any time?					

Section 7

What are the reasons that for food insecurity in urban area?

1. Variables
2. Rapid growth of population
3. Lack of appropriate institution
4. Weak land policy
5. Lack of training for household

Section 8

Cultivated land and farming system

Do you have your own cultivated land?	1.Yes
Do have irrigation farm land?	2.No

Section 9

Types of urban agriculture and market

Variables	Types of production Kg/years
There are different types of urban agriculture in your kebeles?	To produce cereals
	Vegetation and fruit
	Chicken
	Milk and dries product
How many quintals do you provide to the market in monthly?	One quintal Kg/monthly
	Two quintal Kg/monthly
	Three quintal Kg/monthly
	Above four quintal

Section 10 impacts of urban agriculture on food security

Variables	Degree of agreement
There is sufficient food in city to be exploited by urban agriculture	Strongly agree
	Agree
	Neural
	Disagree
	Strongly disagree
	Total
There is an organization that gives credit for urban agriculture activities	Strongly agree
	Agree
	Neural
	Disagree
	Strongly disagree
	Total

Variables	Degree of agreement
The absence of inadequate urban agriculture institution negatively impact on food security urban area?	Strongly agree
	Agree
	Disagree
	Strongly disagree
	Total
Inadequate urban agriculture policy affects insufficient food security in urban area?	
	Strongly agree
	Agree
	Neutral
	disagree
	strongly disagree
	Total