



**Title: Assessment of selected urban agricultural enterprises on peoples' welfare in
Mbarara Municipality South Western Uganda**

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Abstract

This study assessed the contribution of urban agricultural enterprises to people's welfare in Mbarara Municipality, South Western Uganda. It examined the agricultural enterprises practiced, their benefits to household welfare, constraints faced by urban farmers, and strategies used by municipal authorities to address these challenges. The study was motivated by the importance of urban agriculture as a source of food, income, and livelihoods despite policies that may restrict agricultural activities in urban areas.

Data were collected using questionnaires, interview guides, and secondary sources, including reports and official documents. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS), applying descriptive statistics, frequencies, and cross-tabulations.

Findings showed that urban agriculture was common, with 92.5% of respondents confirming its presence. About 58.2% participated in urban agriculture and belonged to farmer groups, while 90.2% agreed that agricultural enterprises significantly improved people's welfare. Inadequate funding was the major constraint, with 84.2% of respondents strongly agreeing that limited finances affected urban farming. Poor technology was also identified as a key challenge.

The study concluded that urban agriculture contributes significantly to household income and food security. It recommends improved market information, microfinance services, technical and business extension training, supportive legal frameworks, access to suitable land, and strengthened farmer organizations to promote sustainable urban agriculture.

Key Words: Urban agricultural enterprises; Welfare; Mbarara Municipality; South Western Uganda.



1.0 Background to the Study

Urban agriculture has become increasingly important as cities expand and face challenges related to food insecurity, poverty, unemployment and environmental sustainability. Recent research shows that urban and peri-urban agriculture can contribute to food availability, dietary diversity, household income and livelihoods, particularly among low-income urban households (Warren et al., 2015; Poulsen et al., 2015). Its contribution, however, varies across locations and depends on access to land and water, production resources, markets, technology and supportive urban policies.

Urban agriculture also has potential environmental and social benefits. Studies indicate that it can support local food systems, improve urban sustainability, contribute to biodiversity and ecosystem services, and strengthen household and community wellbeing. However, these benefits are not automatic because urban agriculture may also create environmental and land-use challenges when poorly managed (Opitz et al., 2016; van Veenhuizen et al., 2022). Recent evidence emphasizes that urban agriculture should therefore be integrated into urban planning and sustainability strategies rather than treated only as an informal survival activity.

In sub-Saharan Africa, rapid urbanization has increased pressure on urban food systems and livelihoods. A recent review found that urban farming can improve food supply, nutrition, employment and income while also reducing some food transportation costs. Nevertheless, urban farmers continue to face constraints including insecure access to land and water, inadequate finance and technical knowledge, weak policy support and environmental pollution (Kiribou et al., 2024).

In Uganda, urban agriculture remains an important livelihood strategy. Recent evidence from Kampala demonstrates that urban agriculture has evolved as a sustainable livelihood activity for urban households, contributing to household welfare while responding to changing economic and food-security conditions (Kwiringira et al., 2024). This is particularly relevant as Uganda's urban population continues to grow, increasing the demand for employment, food and income-generating opportunities.

Mbarara Municipality provides an important context for examining these issues. As a major urban centre in southwestern Uganda, the municipality has experienced economic and population growth, creating increasing demand for food, employment and livelihood opportunities. Urban agriculture, including crop production and livestock keeping, may therefore contribute to household welfare through food production, income generation and employment. However, competition for urban land, limited production resources, environmental concerns and inadequate support services may constrain its benefits.



Although existing studies demonstrate the potential contribution of urban agriculture to food security and urban livelihoods, evidence on its contribution to the welfare of households in specific Ugandan municipalities remains limited. Recent literature also emphasizes the need for context-specific research because the economic, social and environmental outcomes of urban agriculture vary between cities. Therefore, this study examines the contribution of urban agriculture to the welfare of people in Mbarara Municipality, focusing on the agricultural enterprises undertaken, their benefits to households, and the constraints faced by urban farmers. The findings are expected to provide evidence that can inform urban planning, livelihood interventions and policies aimed at improving food security and welfare.

1.2 Statement of the Problem

Urban agriculture is an important livelihood activity in many developing cities and can contribute to household food security, income and employment. Evidence from low-income countries shows that urban agriculture can improve food availability and dietary diversity and provide income to participating households (Poulsen et al., 2015; Warren et al., 2015). In Uganda, recent evidence also indicates that urban agriculture contributes to food, employment and income among urban households (Kwiringira et al., 2024).

Despite these potential benefits, urban farmers face constraints such as limited access to land and water, inadequate resources, environmental risks and insufficient policy and institutional support. These challenges may reduce the contribution of urban agriculture to household welfare.

Although studies have examined urban agriculture and livelihoods in different settings, there is limited context-specific evidence on the contribution of urban agricultural enterprises to household welfare in Mbarara. This creates a need to examine the types of agricultural enterprises practiced, their contribution to people's welfare, the constraints faced by urban farmers, and the strategies used by municipal authorities to address these challenges. Therefore, this study assessed the contribution of urban agriculture enterprises to the welfare of people in Mbarara Municipality.

1.3 Area of Study

The study was conducted in Mbarara Municipality in south-western Uganda, approximately 266 kilometres from Kampala along the Kampala–Kabale road. Mbarara is a major commercial and administrative centre in the region and serves as an important transit town between Uganda and Rwanda.

The municipality's economy is based mainly on trade, business, social services, industry, informal-sector activities and agriculture. Urban and peri-urban agricultural activities are practiced



alongside other livelihood activities. The municipality covers approximately 51.47 square kilometres and comprises the divisions of Kamukuzi, Kakoba and Nyamitanga.

The study covered the three divisions to obtain information from people engaged in urban agricultural enterprises and to provide a broad representation of agricultural activities within the municipality.

1.4 Purpose of the Study

The purpose of the study was to assess the contribution of urban agricultural enterprises to the welfare of people in Mbarara Municipality.

1.5 Objectives of the Study

The study was guided by the following objectives:

1. To identify the agricultural enterprises carried out by people in Mbarara Municipality.
2. To assess the contribution of agricultural enterprises to the welfare of people in Mbarara Municipality.
3. To examine the constraints faced by people engaged in urban agriculture.
4. To identify strategies used by municipal authorities to address constraints affecting urban agricultural enterprises.

1.6 Research Questions

1. What agricultural enterprises are carried out by people in Mbarara Municipality?
2. What contribution do agricultural enterprises make to the welfare of people in Mbarara Municipality?
3. What constraints are faced by people engaged in urban agriculture?
4. What strategies have been put in place by municipal authorities to address these constraints?

1.7 Scope of the Study

1.7.1 Geographical Scope

The study was conducted in Mbarara Municipality, south-western Uganda, covering the three divisions of Kamukuzi, Kakoba and Nyamitanga. The municipality was selected because of its growing urban population and the presence of diverse urban and peri-urban agricultural activities.



1.7.2 Content Scope

The study focused on urban agricultural enterprises and their contribution to household welfare. Specifically, it examined the types of agricultural enterprises practiced, their benefits to households, constraints faced by urban farmers, and strategies used by municipal authorities to address these constraints.

1.7.3 Time Scope

The study focused on the period from 2000 to 2012. This period was selected to enable assessment of changes in urban agricultural enterprises and their contribution to people's welfare over time.

1.8 Significance of the Study

The study provides information on the contribution of urban agriculture to household welfare and the challenges affecting urban farmers. The findings may help municipal authorities and policymakers develop appropriate measures to support productive and sustainable urban agriculture.

The study may also benefit urban farmers by highlighting the major constraints affecting their activities and identifying possible strategies for improving their agricultural enterprises.

In addition, the study contributes to the literature on urban agriculture, livelihoods and household welfare in Uganda and may provide a useful reference for future researchers and agricultural extension practitioners.

1.9 Theoretical Framework

This study was guided by the **Sustainable Livelihoods Approach (SLA)**. The approach provides a framework for understanding how households use available resources and respond to social, economic, institutional and environmental conditions to improve their livelihoods. Recent applications of the Sustainable Livelihoods Framework continue to emphasize the importance of livelihood assets and the interaction between household resources, livelihood strategies and livelihood outcomes (Morse & McNamara, 2016; Scoones, 2015).

The SLA identifies five major categories of livelihood assets: **human, natural, physical, financial and social capital**. Human capital includes knowledge, skills, labour and health; natural capital includes land, water and other natural resources; physical capital includes tools, equipment,



infrastructure and productive assets; financial capital includes income, savings and access to credit; while social capital includes social networks, relationships, associations and institutional support. These assets influence the livelihood strategies available to households and their ability to achieve improved livelihood outcomes.

In the context of this study, urban agriculture depends on access to these livelihood assets. Farmers require land and water for production, labour and knowledge to manage enterprises, physical inputs and equipment, financial resources to purchase inputs, and social networks and institutional

support to access markets and other services. However, access to these resources can be constrained by urban land competition, insecure tenure, limited finance, inadequate infrastructure and weak institutional support. Research on urban agriculture demonstrates that the availability and combination of livelihood assets influence the sustainability and benefits of urban farming activities (Sanyé-Mengual et al., 2019; Orsini et al., 2020).

The framework is particularly relevant to this study because urban agriculture can generate several livelihood outcomes. These include increased household food availability, income from the sale of agricultural products, employment, reduced household expenditure on food and improved social wellbeing. A systematic review of urban and peri-urban agriculture found that its outcomes include material wellbeing, labour and livelihoods, food and nutritional security, and social wellbeing (Nicholls et al., 2020; van Veenhuizen et al., 2022). Evidence from sub-Saharan Africa also indicates that urban agriculture can contribute to household food expenditure and dietary diversity, although its benefits vary according to household and contextual conditions (Sangwan & Tasciotti, 2023).

The SLA also recognizes the importance of the **vulnerability context and institutional environment** in determining livelihood outcomes. Urban farmers operate within a changing environment characterized by urbanization, competition for land, environmental pressures, market conditions and government regulations. Policies and institutions can either facilitate or restrict access to livelihood assets and opportunities. Recent studies therefore emphasize the importance of integrating urban agriculture into urban planning and institutional systems to strengthen its contribution to sustainable livelihoods (van Veenhuizen et al., 2022; Agyapong & others, 2023).

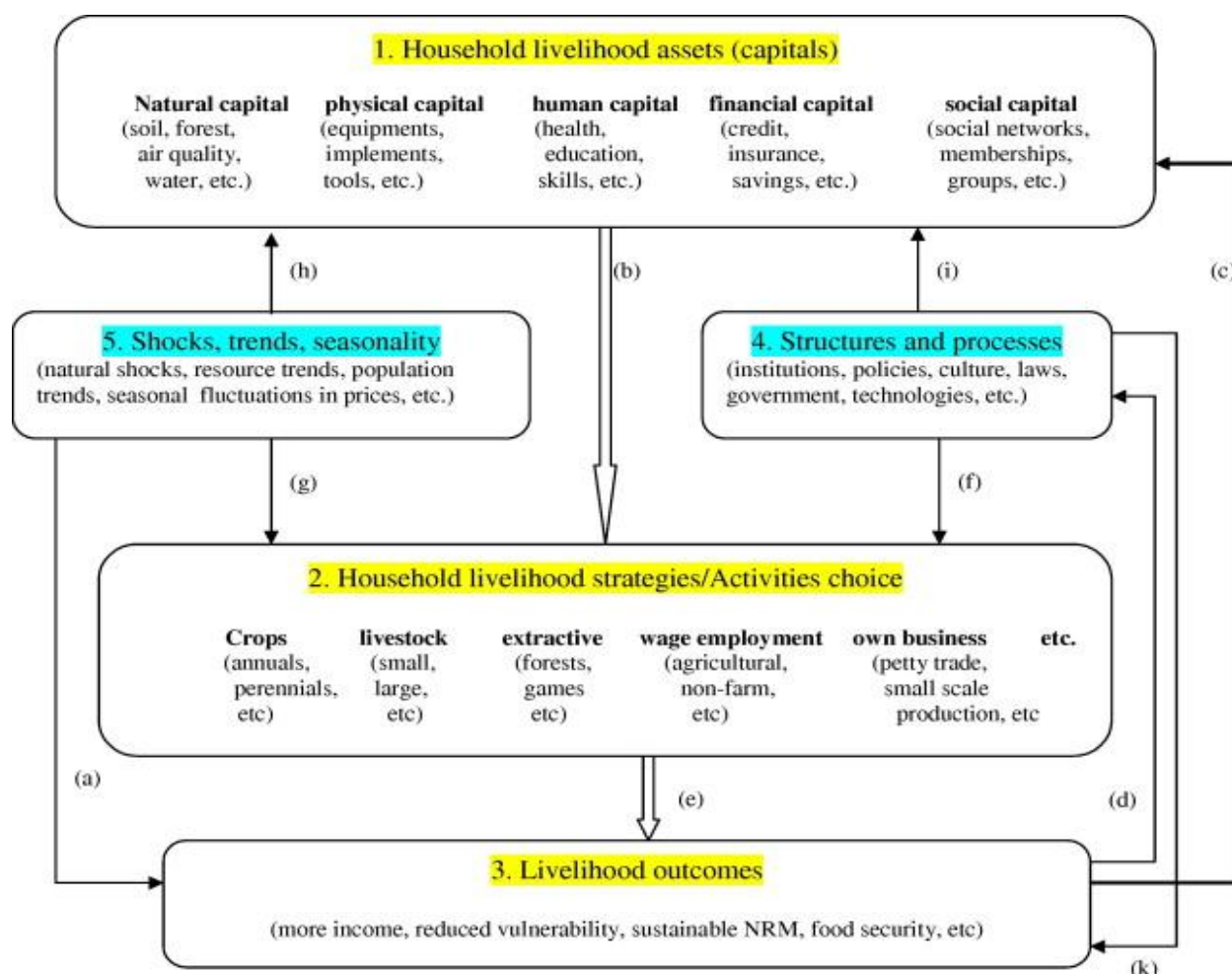
For this study, the five livelihood capitals provide the basis for examining how agricultural enterprises contribute to the welfare of people in Mbarara Municipality. **Natural capital** will mainly consider access to land and water; **physical capital** will include agricultural tools, equipment and infrastructure; **human capital** will consider labour, knowledge and skills; **financial capital** will include income, savings and access to credit; and **social capital** will include social networks, farmer groups and institutional relationships. These assets interact with livelihood strategies, particularly crop production and livestock enterprises, to influence household welfare.



Thus, the Sustainable Livelihoods Approach provides an appropriate theoretical basis for examining the relationship between urban agricultural enterprises, livelihood assets, constraints and household welfare in Mbarara Municipality. It enables the study to move beyond measuring agricultural production alone and assess how urban agriculture contributes to broader livelihood outcomes while taking into account the institutional, social, economic and environmental conditions within which urban farmers operate.

Figure 1: Sustainable Livelihoods Framework

Source: Adapted from the Sustainable Livelihoods Framework and recent applications to urban agriculture (Morse & McNamara, 2016; van Veenhuizen et al., 2022).



1.10 Conceptual Framework

The conceptual framework illustrates the relationship between urban agricultural interventions and household welfare. It is informed by the **Sustainable Livelihoods Approach**, which explains how livelihood assets, livelihood strategies and the institutional environment interact to influence livelihood outcomes (Scoones, 2015; Morse & McNamara, 2016).



In this study, **urban agricultural interventions** constitute the independent variables. These include intensive agricultural enterprises, direct marketing, value addition and processing, access to appropriate agricultural inputs, extension and technical support, and access to finance. These interventions are expected to influence household welfare through increased food production, income generation, employment and improved nutrition.

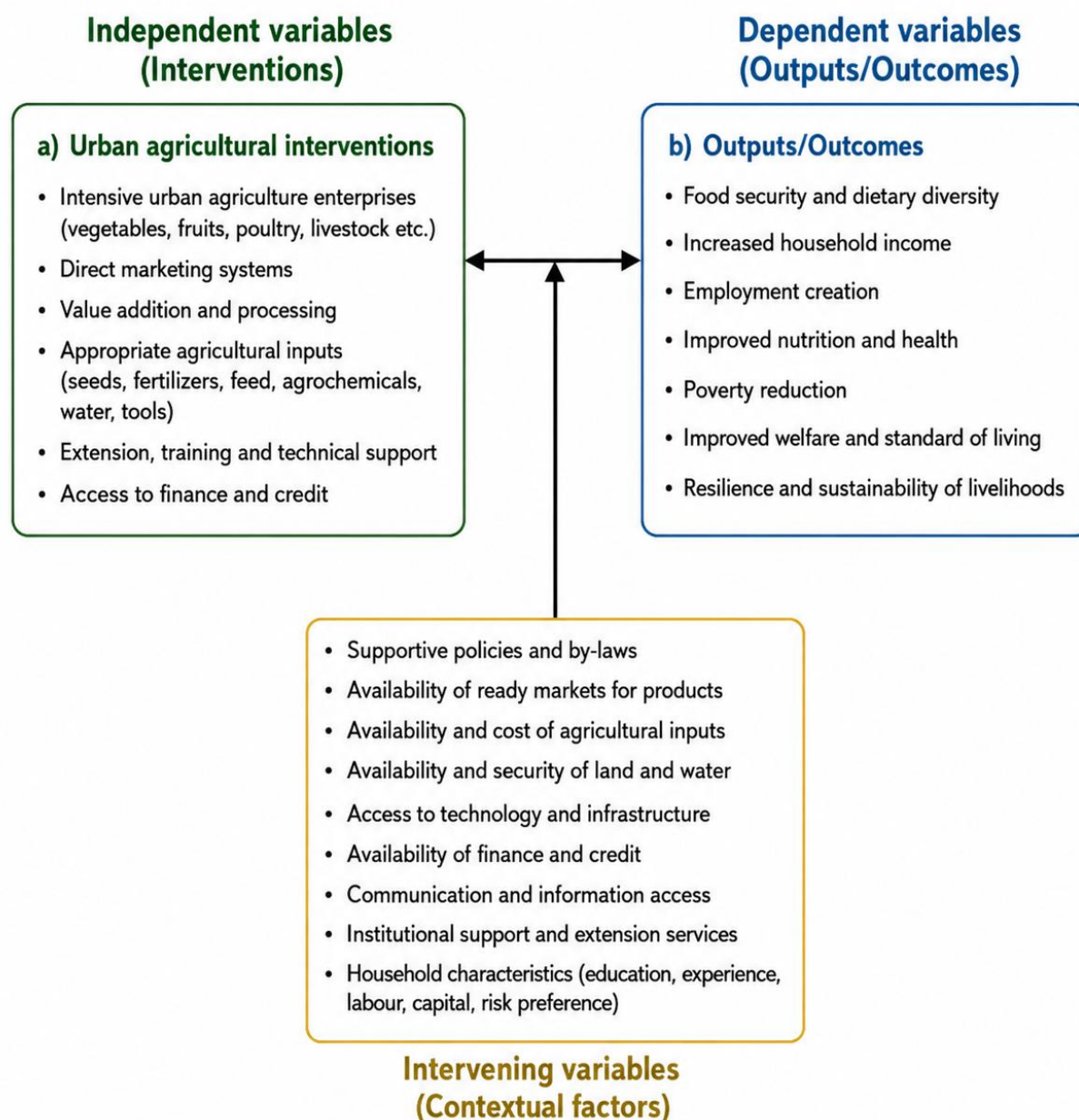
The **dependent variables** are the welfare outcomes associated with participation in urban agriculture. These include food security and dietary diversity, increased household income, employment, improved nutrition and health, poverty reduction, improved standard of living and livelihood resilience. Evidence from recent studies shows that urban agriculture can contribute to food security, household livelihoods and wider social and economic wellbeing, although the magnitude of these benefits varies across contexts (Nicholls et al., 2020; van Veenhuizen et al., 2022).

The relationship between urban agricultural interventions and welfare outcomes is influenced by **intervening variables**. These include supportive policies and by-laws, access to markets, availability and affordability of agricultural inputs, access to secure land and water, technology and infrastructure, finance, communication and information, institutional support and extension services, as well as household characteristics such as education, labour, experience and capital.

The framework therefore assumes that urban agricultural interventions can improve household welfare, but the extent of their contribution depends on the availability of livelihood resources and the social, economic, institutional and environmental conditions in which urban agriculture is practiced. The framework guided the study in examining the types of agricultural enterprises practiced in Mbarara Municipality, their contribution to household welfare, the constraints faced by urban farmers, and the strategies used to address those constraints.



Figure 2: Conceptual framework showing the relationship between urban agricultural interventions and household welfare.



Source: Adopted and updated from IFAD (2012) and recent urban agriculture literature (Armanda et al., 2020; van Veenhuizen et al., 2022).

Explanation of the framework



The **independent variables** are the urban agricultural interventions undertaken by farmers. These include intensive agricultural enterprises such as crop production, poultry and livestock keeping; direct marketing of agricultural products; value addition and processing; access to appropriate inputs; extension and technical support; and access to finance. These activities represent the resources and strategies that farmers use to improve their livelihoods.

The **dependent variables** are the expected welfare outcomes from participating in urban agriculture. These include improved **food security and dietary diversity, increased household income, employment creation, improved nutrition and health, poverty reduction, improved household welfare and standard of living, and livelihood resilience**. The framework therefore assumes that greater access to productive agricultural opportunities can contribute to better household welfare.

The **intervening variables** represent the conditions that can either strengthen or weaken the relationship between urban agriculture and welfare. These include supportive policies and by-laws, availability of markets, access to agricultural inputs, availability and security of land and water, access to technology and infrastructure, finance, communication and information, institutional and extension support, and household characteristics such as education, experience, labour and capital.

For example, an urban farmer may have the skills and willingness to engage in vegetable production, but the contribution of the enterprise to household welfare may remain limited if the farmer lacks **secure land, affordable inputs, water, finance or reliable markets**. Conversely, supportive municipal policies, extension services, technology and market opportunities can increase the potential benefits of urban agriculture.

The framework is therefore consistent with the **Sustainable Livelihoods Approach**, because it emphasizes the resources available to households, the livelihood strategies they adopt, the institutional environment in which they operate, and the resulting livelihood outcomes. This is particularly relevant to Mbarara Municipality because urban farmers operate under conditions of competition for land and other urban resources.

How it relates to your study objectives

Study objective

Identify agricultural enterprises practiced

Assess benefits to household welfare

Examine constraints faced by farmers

Identify strategies used by municipal authorities

Framework component

Independent variables

Dependent variables

Intervening variables

Intervening variables/institutional support



LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature on urban agriculture and its contribution to people's welfare. The review focuses on the nature of urban agriculture, agricultural enterprises practiced in urban areas, its contribution to food security and household welfare, and the constraints affecting urban agricultural activities. Rather than only describing previous studies, the review compares their findings and identifies areas where evidence remains limited, particularly in the Ugandan and Mbarara context.

2.1 Concept and Nature of Urban Agriculture

Urban agriculture generally refers to crop and livestock production undertaken within or around urban areas. It may include horticulture, fruit and vegetable production, poultry, livestock, aquaculture and related activities such as processing and marketing. Recent literature emphasizes that urban agriculture is not separate from the wider urban food system; rather, it interacts with markets, households, institutions and surrounding rural and peri-urban areas (Orsini et al., 2020; Rao et al., 2022).

However, the nature of urban agriculture differs considerably between cities. Its form and scale are influenced by access to land and water, household resources, markets, technology, environmental conditions and urban policies. This suggests that a single definition or model may not adequately explain urban agriculture across different settings. Rao et al. (2022), for example, found substantial differences in the outcomes and research priorities associated with urban and peri-urban agriculture across regions. Their review also identified land tenure, urban planning and livelihoods as particularly important issues in the Global South.

For the present study, urban agriculture is therefore understood broadly as agricultural production undertaken within Mbarara Municipality, including crop and livestock enterprises and related activities that contribute to household livelihoods.



2.2 Agricultural Enterprises in Urban Areas

Urban agricultural enterprises vary according to household resources, market opportunities and the availability of productive land and other inputs. Crop production, vegetables, fruits, poultry and livestock are among the common enterprises, while some farmers combine several activities to spread risk and generate food and income.

Recent evidence challenges the earlier tendency to associate urban agriculture exclusively with the poorest households. A study in Kampala found that urban agriculture has evolved from a predominantly survival activity into a more diverse livelihood and economic activity involving different categories of urban households. The study identified food, employment and income as important motivations for participation and also found evidence of economic inclusion of women and poorer households (Kwiringira et al., 2024).

This evidence suggests that urban farmers should not be treated as a homogeneous group. Differences in access to land, labour, capital, skills and markets may determine both the type of enterprise selected and its contribution to household welfare. However, evidence specifically describing the combination of enterprises and their welfare contribution in Mbarara remains limited. This provides justification for examining the agricultural enterprises practiced in the municipality.

2.3 Urban Agriculture and Household Welfare

The literature generally indicates that urban agriculture can contribute to household welfare through several pathways, particularly food production, income generation, employment and improved access to nutritious foods. However, the evidence also shows that these benefits are neither automatic nor equally distributed.

A systematic review by Rao et al. (2022) identified food and nutritional security, labour and livelihoods, material wellbeing, social wellbeing, land tenure and urban planning among the major outcomes associated with urban and peri-urban agriculture. Importantly, the review found that evidence from the Global South tends to emphasize social and livelihood outcomes, while research is still limited on how urban planning and policy can strengthen these benefits.

This suggests that the contribution of urban agriculture should be assessed beyond agricultural production alone. For households, producing food may reduce expenditure, while selling surplus production may generate income. Employment and livelihood diversification may also reduce vulnerability to other sources of income. Nevertheless, the magnitude of these benefits depends on the scale and type of enterprise and on farmers' access to productive resources.



2.3.1 Urban Agriculture and Food Security

Food security is one of the strongest arguments for promoting urban agriculture. Urban production can increase the availability of fresh food and allow households to consume part of their own production. Evidence from nine sub-Saharan African countries, including Uganda, found that participation in urban agriculture was associated with lower household food expenditure and changes toward greater consumption of protein-rich foods, although the effects differed across households (Sangwan & Tasciotti, 2023).

Similarly, Kiribou et al. (2024) conclude that urban farming can strengthen food supply, improve access to nutritious foods and create income and employment in sub-Saharan African cities. However, they emphasize that rapid urbanization, limited land and water, weak policy support, inadequate technology and environmental pollution constrain these benefits.

The evidence therefore supports a positive relationship between urban agriculture and food security, but it also indicates that participation alone does not guarantee improved food security. Differences in production scale, household resources and access to markets may explain variations in outcomes. This study therefore examines food security as one component of household welfare rather than assuming that all urban farmers automatically benefit equally.

2.3.2 Economic Contribution of Urban Agriculture

Urban agriculture can contribute economically through direct income from the sale of agricultural products, employment and savings from household food production. Recent evidence from Kampala supports this argument, showing that urban agriculture provides food, jobs and income and has become an evolving component of the urban economy (Kwiringira et al., 2024).

However, the economic contribution of urban agriculture remains contested. Some enterprises may generate reasonable returns, while others may be constrained by high input costs, limited land, poor market access and low levels of value addition. A recent review similarly notes that the economic profitability of urban agriculture can be weak even though the sector generates wider social and environmental benefits (2022 review).

This distinction is important because household welfare may improve even where direct agricultural profits are modest. For example, food consumed by the household represents savings that can be used for education, health and other necessities. The present study therefore considers both income and other household benefits when assessing the economic contribution of urban agriculture.

2.3.3 Social and Gender Dimensions



Urban agriculture can also contribute to social welfare by creating livelihood opportunities for groups with limited access to formal employment. Evidence from Kampala indicates that urban agriculture contributes to the economic inclusion of women and poorer households (Kwiringira et al., 2024).

Nevertheless, the benefits of participation may not be equally distributed. Access to land, finance, labour, markets and decision-making can differ between men and women and between households with different socioeconomic characteristics. Rao et al. (2022) identify gender and social differentiation as areas that remain underrepresented in the urban agriculture literature.

This creates an important analytical issue for the current study: measuring only the number of households engaged in agriculture may conceal differences in who benefits and how. Examining household welfare therefore requires consideration of the social and resource conditions under which urban agriculture is practiced.

2.3.4 Environmental Contribution

Urban agriculture can provide environmental benefits through the creation of green spaces, recycling of organic resources, biodiversity support and improved use of urban open spaces. Rao et al. (2022) found environmental sustainability to be one of the major themes in the literature on urban and peri-urban agriculture.

However, the environmental contribution of urban agriculture depends strongly on management practices. The use of contaminated water, polluted soils or inadequately treated waste may create risks to farmers, consumers and the wider urban environment. Thus, urban agriculture can simultaneously generate environmental benefits and risks. This reinforces the need for appropriate technologies, regulation and institutional support rather than assuming that all forms of urban agriculture are environmentally sustainable.

2.4 Constraints Affecting Urban Agriculture

Despite its potential contribution to welfare, urban agriculture operates within significant structural constraints. **Land access** is particularly important because agricultural activities compete with residential, commercial and infrastructure development. As cities expand, agricultural spaces may be converted to other uses, while insecure tenure can discourage farmers from investing in productive improvements.

Access to **water, agricultural inputs, finance and technology** presents additional challenges. Kiribou et al. (2024) identify inadequate access to land and water, limited financing, inadequate



knowledge and technology, weak policy and governance, and environmental pollution as major constraints to urban farming in sub-Saharan Africa.

Markets and institutional support also influence outcomes. Farmers may produce food but receive limited economic benefits where markets are unreliable, input prices are high or value-addition opportunities are unavailable. The Kampala evidence suggests that farmer organization, affordable finance, better inputs, institutional linkages, value addition and marketing can strengthen the contribution of urban agriculture (Kwiringira et al., 2024).

The literature therefore indicates that the main problem is not simply whether urban agriculture is practiced, but whether farmers have the resources and institutional conditions necessary to make it productive and sustainable. This distinction is important for the current study because identifying constraints provides a basis for assessing the strategies required to improve the contribution of urban agriculture to welfare in Mbarara Municipality.

2.5 Synthesis and Research Gap

The reviewed literature demonstrates that urban agriculture can contribute to **food security, household income, employment, nutrition and broader welfare**. Recent studies from sub-Saharan Africa and Uganda provide evidence of these benefits, particularly through food production, income generation and livelihood diversification (Sangwan & Tasciotti, 2023; Kiribou et al., 2024; Kwiringira et al., 2024).

However, the literature also shows that these benefits are **context-dependent**. Access to land and water, finance, inputs, markets, technology, institutional support and urban policies can determine whether agricultural activities translate into improved welfare. Moreover, much of the recent literature focuses on large cities or broader regional patterns, while evidence at the municipal level remains comparatively limited. Rao et al. (2022) further identify gaps concerning the integration of urban agriculture into planning and the distribution of benefits across social groups.

Therefore, there is a need for context-specific evidence on the types of agricultural enterprises practiced in Mbarara, their contribution to household welfare, the constraints faced by urban farmers and the strategies used by municipal authorities to address those constraints. This study addresses that gap by examining urban agriculture and household welfare in Mbarara Municipality.

RESEARCH METHODOLOGY



3.0 Introduction

This chapter presents the methodology used to examine the contribution of urban agricultural enterprises to the welfare of people in Mbarara Municipality. It describes the research design, study variables and their measurement, study population, sample size, sampling strategy, data collection methods and tools, data quality control, data collection procedure, ethical considerations, data management, data analysis and limitations of the study.

3.1 Research Design

The study adopted a **mixed-methods case study research design**, combining quantitative and qualitative approaches. The quantitative approach was used to generate numerical information concerning urban agricultural enterprises, welfare benefits, constraints and institutional interventions. The qualitative approach was used to obtain respondents' views, experiences and explanations regarding urban agriculture and its contribution to household welfare.

A mixed-methods approach was appropriate because the study required both measurable evidence and detailed explanations of respondents' experiences. Mixed-methods research allows researchers to combine quantitative and qualitative evidence to obtain a broader understanding of a research problem (Creswell & Creswell, 2018; Taherdoost, 2022). Creswell and Creswell (2018) further emphasize that the choice of research approach should be guided by the research questions and the type of evidence required.

The study also adopted a case-study design because it focused on urban agricultural enterprises within the specific geographical and institutional context of Mbarara Municipality. A case study enables researchers to investigate a phenomenon within its real-life context and to obtain detailed understanding of the relationships and experiences associated with it (Creswell & Creswell, 2018).

The combination of the two approaches was therefore considered suitable for examining not only the measurable contribution of urban agriculture to welfare but also the experiences, constraints and institutional factors influencing urban farmers.

3.2 Study Variables and Their Measurement

The study considered **urban agriculture as the independent variable** and **people's welfare as the dependent variable**. Urban agricultural interventions included intensive agricultural enterprises, direct marketing, value addition and access to appropriate agricultural inputs.

People's welfare was assessed using indicators including employment, income, food security, empowerment, education and gender equality. Constraints affecting urban agriculture and



municipal strategies were also examined because they influence farmers' ability to participate in agricultural activities and obtain welfare benefits.

Table 3.1: Study Variables and Indicators

Study objective	Variable	Indicators
Agricultural enterprises carried out in Mbarara Municipality	Urban agricultural enterprises	Horticulture, aquaculture, poultry, piggery, cattle keeping and animal breeding
Contribution of agricultural enterprises to welfare	Welfare benefits	Employment, income, food security, empowerment, education and gender equality
Constraints affecting urban agriculture	Constraints	Seasonality, prices, municipal laws and regulations, population pressure and land shortages
Strategies used by municipal authorities	Municipal strategies	Credit programmes, extension services, SACCOs and gender mainstreaming
Independent variable	Urban agricultural interventions	Intensive agricultural enterprises, direct marketing, value addition and appropriate inputs

Source: Adapted from the original study framework and field research design.

The selection of indicators was guided by the research objectives and the conceptualization of urban agriculture and welfare. Using clearly defined variables and indicators helps ensure that the data collected correspond directly with the research questions and objectives (Saunders, Lewis, & Thornhill, 2019).

3.3 Study Population

The study was conducted in Mbarara Municipality. The primary respondents were men and women engaged in urban farming. They provided information concerning the agricultural enterprises they practiced, resources used, benefits obtained and constraints encountered.

The study also included local leaders and agricultural extension workers. Local leaders provided information concerning municipal policies, regulations and programmes, while agricultural extension workers provided information concerning technical advice, agricultural support and extension services available to urban farmers.



The inclusion of different respondent categories enabled the study to obtain information from both direct participants in urban agriculture and institutional stakeholders. Using multiple sources of information also supported the integration of quantitative and qualitative evidence, which is an important feature of mixed-methods research (Taherdoost, 2022).

3.4 Sample Size

The study used a total sample of **150 respondents**. This comprised 110 urban farmers, 25 local leaders and 15 agricultural extension workers. Farmers constituted the largest proportion because they were directly involved in urban agricultural activities and were therefore the principal source of information concerning production and welfare outcomes.

Table 3.2: Distribution of Respondents

Respondent category	Number	Percentage	Data collection method
Urban farmers	110	73.3%	Questionnaire
Local leaders	25	16.7%	Interview
Agricultural extension workers	15	10.0%	Interview
Total	150	100%	

Source: Field Research Findings, July 2015.

The study sought to achieve reasonable representation of men and women among the farmer respondents. However, the available original study information does not provide the final numerical distribution of respondents according to sex, age, education or household size. These characteristics should therefore be obtained from the original field dataset rather than estimated.

3.4.1 Sample Size Determination

The original study indicated that the sample size was determined using the Kish sampling formula:

$$n=1+N(e)2N$$

where n represents the required sample size, N represents the target population and e represents the acceptable margin of error.

The original document does not provide sufficient information to independently reproduce the stated sample of 150 respondents from the formula. Therefore, the study retains **150 respondents as the actual field sample** rather than introducing an unsupported recalculation.



Contemporary research methodology emphasizes that sample-size decisions should be linked to the study population, research design, desired precision and analytical requirements (Creswell & Creswell, 2018).

3.5 Sampling Strategy

The study employed a **multistage sampling strategy** involving cluster, simple random and purposive sampling.

Mbarara Municipality was considered through its three divisions of Nyamitanga, Kakoba and Kamukuzi. Cluster sampling was used to identify study areas, while the original methodology indicates that 20 cells were selected using a lottery approach.

Within the selected areas, households engaged in urban agriculture were identified and eligible farmers were selected using simple random sampling where appropriate sampling lists were available. Probability-based selection was used to reduce the possibility of systematic selection bias.

Local leaders and agricultural extension workers were selected purposively because they possessed specialized knowledge concerning municipal policies, agricultural regulations, extension services and institutional support. Purposive sampling is appropriate when researchers deliberately select participants who possess information relevant to the research problem (Saunders et al., 2019).

The combination of sampling strategies allowed the study to obtain information from both agricultural practitioners and institutional stakeholders. It was therefore consistent with the mixed-methods design and the different information requirements of the study.

3.6 Data Collection Methods and Tools

Both primary and secondary data were used. Primary data were collected directly from respondents using questionnaires, interviews and direct observation. Secondary information was obtained from relevant books, journal articles, policy documents, reports and other documentary sources.



Using several data collection methods allowed the researcher to compare and complement information obtained from different sources. Such methodological integration can strengthen understanding of complex social and economic phenomena (Creswell & Creswell, 2018; Taherdoost, 2022).

3.6.1 Questionnaire

A structured and semi-structured questionnaire was administered to urban farmers. It contained closed-ended questions for quantitative information and open-ended questions that allowed respondents to explain their experiences and opinions.

The questionnaire covered the types of urban agricultural enterprises practiced, income, employment, food security, empowerment, education, gender-related benefits, constraints and access to institutional support.

The researcher administered the questionnaires directly. Where respondents had difficulties reading or writing, the questions were explained to them to facilitate participation and improve completeness of the responses.

Questionnaires are useful for collecting standardized information from a relatively large number of respondents and are particularly suitable where comparable responses are required across participants (Saunders et al., 2019).

3.6.2 Key-Informant Interviews

Key-informant interviews were conducted with local leaders and agricultural extension workers using an interview guide.

The interviews focused on municipal policies, regulations governing urban agriculture, extension services, credit and support programmes, constraints affecting farmers and strategies for improving urban agricultural enterprises.

Interviews allowed the researcher to obtain detailed explanations and explore issues that could not be fully captured through structured questionnaires. Qualitative interviewing is particularly useful where researchers seek to understand participants' experiences, interpretations and perceptions (Creswell & Creswell, 2018).

Probing questions were used where clarification or additional information was required.

3.6.3 Direct Observation



Direct observation was used to supplement information obtained through questionnaires and interviews. An observation checklist was used to record visible characteristics of agricultural enterprises.

The researcher observed crops and livestock, farm structures, production practices, value-addition activities, record keeping, group activities and other relevant aspects of urban agricultural production.

Observation provided an additional source of evidence and helped the researcher compare information reported by respondents with conditions observed in the field. Observation is recognized as an important method for collecting primary evidence about activities and practices as they occur in their natural setting (Saunders et al., 2019).

3.6.4 Documentary Review

Documentary review was used to obtain background information on urban agriculture, municipal planning, agricultural policies and institutional interventions.

Relevant documents were reviewed to complement primary information and provide contextual understanding of the development and management of urban agriculture.

The use of secondary data and documentary sources can complement primary data and provide information that may not be directly available through respondents (Saunders et al., 2019).

3.7 Data Quality Control

Several procedures were used to improve data quality. The research instruments were reviewed to ensure that questions corresponded with the study objectives, variables and indicators.

The instruments were pre-tested before the main data collection. Completed questionnaires were checked for completeness and consistency. During interviews, unclear questions were explained and probing was used where necessary.

These procedures were intended to reduce errors and improve the validity and reliability of the collected information. Careful instrument development and pre-testing are important stages in ensuring that research instruments produce useful and consistent data (Saunders et al., 2019).

3.7.1 Validity of Instruments

Content validity was enhanced through consultation with the research supervisors.



The questionnaire and interview guide were reviewed to ensure that they adequately covered the research objectives and study variables. This process helped ensure that the instruments generated information relevant to urban agricultural enterprises and welfare.

Creswell and Creswell (2018) emphasize the importance of establishing appropriate procedures to enhance the quality and credibility of research evidence.

3.7.2 Reliability of Instrument

Reliability was enhanced through pre-testing of the questionnaire and interview guide before the main study. The pre-test enabled the researcher to identify unclear, repetitive or inappropriate questions and make the necessary revisions.

Pre-testing also helped establish whether respondents interpreted questions consistently and whether the instruments could adequately capture the information required for the study. Questionnaire development and pilot testing are important aspects of rigorous research design (Saunders et al., 2019).

3.8 Data Collection Procedure

The researcher obtained an introductory letter from Bishop Stuart University and presented it to the relevant local authorities. The authorities assisted the researcher in accessing the selected communities and respondents.

Questionnaires were administered to urban farmers, while interviews were conducted with local leaders and agricultural extension workers. The researcher explained the purpose of the study to respondents and obtained their willingness to participate.

Completed questionnaires were checked for completeness, while information obtained through interviews and observations was recorded for subsequent analysis.

The original study indicates that questionnaire administration took approximately one week, while interviews with local leaders and extension workers were conducted over approximately two weeks.

3.9 Ethical Considerations

Ethical principles were observed throughout the research process. Respondents were informed about the purpose of the study and the type of information required from them.



Participation was voluntary, and respondents were given an opportunity to seek clarification before providing information. They were informed that the information collected would be used for academic purposes.

Research ethics are an important component of the research process, particularly in relation to informed participation, confidentiality and responsible handling of information (Creswell & Creswell, 2018; Saunders et al., 2019).

3.9.1 Confidentiality

Respondents were assured that information provided would be treated confidentially. Individual respondents were not unnecessarily identified when reporting the findings.

Confidentiality was particularly important because some questions concerned household income, agricultural production, livelihood conditions and constraints affecting farmers.

3.10 Data Management

After data collection, questionnaires were checked, edited, coded and organized for analysis. Each questionnaire was assigned an identification number to facilitate data entry and checking.

Quantitative responses were coded and entered into statistical software. Responses to open-ended questions, interview notes and observations were organized according to themes related to the study objectives.

The data were checked for missing or inconsistent responses before analysis. Proper organization and preparation of data are important for ensuring that subsequent statistical and qualitative analyses are based on accurate and usable information (Saunders et al., 2019).

3.11 Data Analysis

Both qualitative and quantitative approaches were used to analyze the collected information. The analysis was guided by the study objectives and research questions.

The use of both forms of analysis was consistent with the mixed-methods design, which allows numerical findings to be complemented by qualitative explanations (Creswell & Creswell, 2018; Taherdoost, 2022).



3.11.1 Qualitative Data Analysis

Qualitative information obtained from interviews, observations and open-ended questionnaire responses was analyzed thematically.

The analysis focused on themes concerning urban agricultural enterprises, welfare benefits, constraints affecting urban agriculture, municipal interventions and institutional support.

Respondents' views were used to explain and complement quantitative findings. Selected statements were presented verbatim where appropriate to illustrate important themes and provide deeper insight into respondents' experiences.

Thematic organization of qualitative evidence allows researchers to identify patterns and meanings within participants' accounts (Creswell & Creswell, 2018).

3.11.2 Quantitative Data Analysis

Quantitative data were coded and analyzed using statistical software. Descriptive statistics included frequencies, percentages, means and standard deviations.

Tables, graphs and charts were used to summarize the findings. Descriptive analysis was used to establish the distribution of agricultural enterprises, welfare indicators, constraints and institutional interventions.

Quantitative analysis provides a systematic means of summarizing numerical information and examining relationships among variables (Saunders et al., 2019).

3.11.3 Correlation Analysis

Correlation analysis was included to examine the direction and strength of the relationship between participation in urban agriculture and selected welfare indicators.

The analysis may examine relationships between urban agricultural participation and indicators such as household income, employment and food security, depending on the variables available in the original dataset.

A positive correlation would indicate that higher levels of participation are associated with higher welfare scores, whereas a negative correlation would indicate an inverse relationship. Statistical significance would be assessed at the five-percent level.



However, correlation would be interpreted as evidence of association rather than proof that urban agriculture directly caused changes in welfare. This distinction is important when interpreting relationships in observational research.

3.11.4 Regression Analysis

Multiple regression analysis was included to strengthen the assessment of the relationship between urban agricultural interventions and welfare outcomes.

The general regression model is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

where Y represents the welfare outcome, while X₁, X₂, X₃ and X₄ represent relevant urban agricultural interventions. These may include intensity of agricultural production, access to inputs, market access and value addition, depending on the variables contained in the original dataset.

The regression analysis would provide information on the direction and magnitude of the relationship between the explanatory variables and welfare. Regression coefficients, R², adjusted R² and significance levels would be reported where the necessary data are available.

The use of regression is appropriate where the researcher seeks to examine relationships between a dependent variable and multiple explanatory variables (Saunders et al., 2019).

Because the study used a case-study and cross-sectional design, regression results would be interpreted as associations or predictive relationships rather than definitive evidence of causality.

3.11.5 Inferential Statistical Analysis

Where appropriate, chi-square tests were used to examine associations between categorical variables. Independent-samples t-tests could be used to compare mean welfare outcomes between two groups, while analysis of variance could be used where comparisons involved more than two groups.

The selection of an inferential statistical test was based on the research question, measurement level and characteristics of the data. Statistical significance was assessed at the five-percent level.

The inclusion of inferential statistics strengthens the analysis by moving beyond simple description and examining whether observed relationships between variables are statistically meaningful.



3.12 Limitations of the Study

The study encountered several limitations. Some respondents were initially reluctant to provide information because they were uncertain about the purpose of the research. This was addressed by explaining the academic purpose of the study and assuring respondents of confidentiality.

Language differences also presented a challenge because some respondents were more comfortable communicating in local languages. Where necessary, an interpreter assisted the researcher in communicating with respondents.

The study also experienced financial constraints associated with transportation, communication, printing and accommodation. These challenges were addressed through careful planning and budgeting.

Another limitation was the cross-sectional nature of the study. Data were collected during a particular period and therefore provide evidence about relationships between urban agriculture and welfare at that time. The design cannot by itself establish long-term causal effects.

The study was geographically limited to Mbarara Municipality and specifically covered the three divisions of Nyamitanga, Kakoba and Kamukuzi. In terms of content, it focused on urban agricultural enterprises, their contribution to welfare, constraints affecting urban farmers and strategies implemented by municipal authorities.

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents, analyses and discusses the findings of the study on the contribution of urban agricultural enterprises to household welfare in Mbarara Municipality. The presentation follows the study objectives, namely: to identify the agricultural enterprises undertaken by people in Mbarara Municipality; to assess their contribution to household welfare; to examine the constraints affecting urban agriculture; and to identify strategies for addressing those constraints.

The chapter begins with the characteristics of respondents, followed by findings on agricultural enterprises, production systems and techniques, income sources, constraints, measures for improving production, and the contribution of agricultural enterprises to household welfare. The findings are then discussed in relation to recent literature from Uganda and other African urban



settings. Because the field data were collected in 2014, the recent literature is used to place the original findings in a contemporary context rather than to suggest that the original data are current.

4.1 Characteristics of respondents

The study involved 110 farmer respondents for the quantitative analysis. The respondents were drawn from the three divisions of Mbarara Municipality and represented people engaged in urban agricultural activities. Information was collected on sex, age, marital status, education and occupation.

4.1.1 Sex of respondents

Table 4.1: Sex of respondents

Sex	Frequency	Percentage
Male	70	63.6
Female	40	36.4
Total	110	100.0

Source: Field Research Findings, 2014.

The findings show that males constituted 63.6% of the respondents, while females constituted 36.4%. This indicates greater male representation among the farmers included in the study. However, the participation of women was also substantial, showing that urban agriculture was not exclusively a male activity.

The difference in participation may partly reflect differences in access to land, labour, capital and decision-making within households. It is therefore important for urban agricultural interventions to consider the different resources and constraints experienced by men and women.

The correlation between sex and having an agricultural enterprise was approximately zero ($r = 0.000$, $p = 0.997$). This indicates that, within this sample, there was no statistically significant relationship between sex and participation in agricultural enterprises.

4.1.2 Marital status of respondents



The findings indicated that 72.7% of respondents were married, 18.2% were single, 6.4% were divorced and 2.7% were widowed.

The high proportion of married respondents suggests that urban agriculture was largely undertaken by people with household responsibilities. Agricultural production could therefore serve as an important means of supplementing household income and food supplies.

However, marital status alone cannot be assumed to determine participation in urban agriculture. Household access to land, labour, capital, skills and markets is likely to influence participation more directly.

4.1.3 Age of respondents

The findings showed that the largest proportion of respondents was aged 31–40 years, accounting for 63.6%. Respondents aged 41 years and above represented 15.5%, those aged 21–30 years represented 11.8%, while those below 21 years accounted for 9.1%.

The predominance of adults in the 31–40 age category suggests that urban agriculture was mainly undertaken by economically active members of households. This age group may have had greater household responsibilities and therefore stronger incentives to engage in income-generating activities.

The reported correlation between age and participation in agricultural enterprises was $r = -0.194$, $p = 0.046$. This represents a **weak negative relationship**, rather than a strong relationship. Although statistically significant at the 5% level, the small coefficient indicates that age by itself explains only a small proportion of differences in participation.

4.1.4 Education level of respondents

The findings showed that 45.5% of respondents had primary education, 27.3% had secondary education, 9.1% had tertiary education, 9.1% had university education, while 9.1% had never attended school.

The findings indicate that most respondents had received at least some formal education. This could facilitate access to agricultural information, record keeping, communication with extension workers and adoption of improved production practices.

The reported relationship between education and participation in agricultural enterprises was weak and negative ($r = -0.194$, $p = 0.035$). This indicates a statistically significant association in the



sample, but the magnitude of the relationship was small. The finding therefore does not justify concluding that education was a major determinant of participation.

4.1.5 Occupation of respondents

Table 4.2: Occupation of respondents

Occupation	Frequency	Percentage
Farmer	90	81.8
Employed	20	18.2
Total	110	100.0

Source: Field Research Findings, 2014.

Most respondents (81.8%) identified farming as their main occupation, while 18.2% were employed in addition to undertaking agricultural activities. This demonstrates that urban agriculture provided an important livelihood activity for the sampled households.

The presence of respondents with employment outside agriculture also demonstrates that urban farming can be combined with other livelihood activities. This is consistent with the livelihood perspective, which recognizes that households commonly diversify their sources of income and food rather than depending on a single activity.

4.2 Agricultural enterprises undertaken by households

4.2.1 Livestock enterprises

The major livestock enterprises reported were poultry, cattle, piggery and beekeeping. Poultry and cattle each accounted for 36.4%, piggery accounted for 18.2%, while beekeeping accounted for 9.1%.

The findings suggest that poultry and cattle were particularly important livestock enterprises among the respondents. Their importance may be related to their ability to generate food and income and to provide assets that can be sold when households face financial needs.



Interviews with extension personnel and local leaders similarly indicated that poultry and cattle were considered viable enterprises, although respondents noted that they required appropriate feeding, disease control, housing and other inputs.

Recent evidence from Kampala shows that poultry and livestock continue to form an important component of urban agriculture. Kwiringira et al. (2024) found that urban agriculture in Kampala had evolved into a livelihood activity providing food, employment and income, with livestock and poultry forming part of the urban production system.

4.2.2 Crop enterprises

The major crop enterprises were bananas, beans, maize and coffee. Bananas accounted for 45.5%, beans and maize each accounted for 18.2%, other crops accounted for 11.8%, while coffee accounted for 6.4%.

Bananas were therefore the most commonly reported crop enterprise. The importance of bananas, beans and maize suggests that urban farmers combined food production with activities that could generate income.

The findings also indicate that urban agriculture contributed to household food availability. Producing crops within or near the municipality can reduce dependence on purchased food and may provide opportunities for selling surplus production.

4.2.3 Other sources of income

Table 4.3: Other income sources

Income source	Frequency	Percentage
Salaries/wages	50	45.5
Other sources	60	54.5
Total	110	100.0

Source: Field Research Findings, 2014.

The findings show that 45.5% of respondents received salaries or wages, while 54.5% reported other income sources. These included various informal activities and small businesses.

The results demonstrate that households did not depend entirely on agricultural production. Instead, agriculture formed part of a diversified livelihood strategy. This is important when



assessing welfare because improvements in household welfare cannot necessarily be attributed entirely to agriculture.

4.3 Production systems and practices

4.3.1 Crop production systems

Table 4.4: Systems used in crop production

Production system	Frequency	Percentage
Small scale	60	54.5
Semi-intensive	35	31.8
Extensive	15	13.6
Total	110	100.0

Source: Field Research Findings, 2014.

Small-scale production was the most common system, accounting for 54.5% of respondents. Semi-intensive production accounted for 31.8%, while extensive production accounted for 13.6%.

The dominance of small-scale farming reflects the limited land available to urban households and the household-oriented nature of much urban agriculture. It also indicates that increasing productivity may depend more on improving the efficiency of available land and inputs than on expanding farm size.

4.3.2 Crop production techniques

Table 4.5: Techniques used in crop production

Technique	Frequency	Percentage
Early planting	40	36.4
Pest and disease control	50	45.5
Other/maturing practices	20	18.2
Total	110	100.0

Source: Field Research Findings, 2014.



Pest and disease control was the most frequently reported practice at 45.5%, followed by early planting at 36.4%. Other practices accounted for 18.2%.

The results demonstrate farmers' attempts to improve production through agronomic practices. Interviews with extension personnel also emphasized the importance of appropriate agronomic practices in improving productivity and quality.

4.3.3 Livestock production systems

Table 4.6: Systems used in livestock production

Production system	Frequency	Percentage
Small scale	70	63.6
Semi-intensive	25	22.7
Extensive	15	13.6
Total	110	100.0

Source: Field Research Findings, 2014.

Small-scale livestock production was dominant, accounting for 63.6% of respondents. Semi-intensive production accounted for 22.7%, while extensive production accounted for 13.6%.

The predominance of small-scale livestock production indicates that livestock was largely integrated into household livelihood strategies rather than operated as large commercial enterprises.

4.3.4 Livestock production techniques

Table 4.7: Techniques used in livestock production

Technique	Frequency	Percentage
Housing	20	18.2
Feeding	70	63.6
Vaccination	20	18.2
Total	110	100.0

Source: Field Research Findings, 2014.



Feeding was the most commonly reported livestock management practice at 63.6%. Housing and vaccination each accounted for 18.2%.

The results indicate that farmers recognized the importance of animal management, although the relatively low proportion reporting vaccination suggests a potential need for stronger animal health services and extension support.

4.3.5 Marketing, transportation, storage and processing

Respondents reported marketing (54.5%) as the most common activity among the additional techniques used in their enterprises, followed by transportation (27.3%), storage (9.1%) and processing (9.1%).

The predominance of marketing indicates that households were not only producing for consumption but also participating in local markets. However, the low proportion reporting processing and storage suggests opportunities for value addition and reduction of post-harvest losses.

Recent research in Kampala has similarly shown that proximity to urban consumers can create market opportunities for urban farmers, particularly for perishable products. However, farmers continue to face institutional, financial and technological constraints. (Kwiringira et al., 2024).

4.4 Income from agricultural enterprises

4.4.1 Income from crop production

The findings showed that 45.5% of households earned between 300,000ugx and 600,000ugx from crop production annually, 27.3% earned between 600,000ugx and 900,000ugx, 18.2% earned 1,000,000ugx or more, while 9.1% earned between 100,000ugx and 300,000ugx.

These results indicate considerable variation in agricultural earnings. Most households operated at relatively small scales, while a smaller proportion generated higher returns.

The findings suggest that income generation was an important pathway through which urban agriculture could influence household welfare. However, income levels should be interpreted cautiously because they were self-reported and were not independently verified.

4.4.2 Income from livestock production



The reported annual livestock income showed a similar pattern. The largest proportion of respondents (45.5%) reported incomes in the lower income category, followed by 27.3% in the next category and 18.2% reporting 1,000,000 or more.

The results suggest that livestock production contributed financially to households, although returns varied between households. The differences may be related to enterprise type, herd or flock size, access to inputs, disease control and market conditions.

4.5 Constraints affecting urban agriculture

4.5.1 Constraints in crop production

Table 4.8: Constraints faced in crop production

Constraint	Frequency	Percentage
Lack of skilled labour	30	27.3
Limited raw materials/inputs	20	18.2
Poor technology	60	54.5
Total	110	100.0

Source: Field Research Findings, 2014.

Poor technology was the leading constraint, reported by 54.5% of respondents. Lack of skilled labour was reported by 27.3%, while limited inputs or raw materials accounted for 18.2%.

The results suggest that productivity was constrained not only by the availability of land but also by access to appropriate production technologies and skills.

4.5.2 Constraints in livestock production

Table 4.9: Constraints faced in livestock production

Constraint	Frequency	Percentage
Lack of skilled labour	35	31.8
Limited raw materials/inputs	15	13.6
Poor technology	60	54.5
Total	110	100.0



Source: Field Research Findings, 2014.

Poor technology was again the most important constraint at 54.5%, followed by lack of skilled labour at 31.8% and limited inputs at 13.6%.

Recent evidence from Kampala and Mbarara provides strong support for these findings. Ninsheka et al. (2024) identified limited access to improved technologies and training among the important constraints affecting urban agriculture in the two cities. The study recommended improved extension, credit and access to technologies.

4.5.3 Marketing constraints

For crop production, inflation was reported by 54.5% of respondents, poor transport facilities by 18.2%, other problems by 18.2%, and competition by 9.1%.

For livestock, inflation was reported by 45.5%, while poor transport and competition each accounted for 27.3%.

The findings indicate that market conditions significantly influenced the returns obtained from agricultural enterprises. Rising prices of inputs and transportation costs can reduce farmers' margins, while competition can reduce the prices received by producers.

4.6 Measures for improving agricultural production

4.6.1 Crop production

The findings indicate that the most commonly reported measure for improving crop production was the use of quality inputs (63.6%). Pest and disease control accounted for 18.2%, while manuring and early planting each accounted for 9.1%.

These findings suggest that farmers recognized the importance of input quality and appropriate crop management. Improved access to affordable quality inputs could therefore increase productivity.

4.6.2 Livestock production

Improved breeds were the most frequently reported measure for improving livestock production, accounting for 54.5%. Feeding accounted for 9.1%, while housing and disease and pest control each accounted for 18.2%.



The findings suggest that farmers regarded improved breeds as an important way of increasing livestock productivity. However, improved breeds require adequate feeding, housing, veterinary services and management if they are to generate the expected benefits.

4.7 Contribution of agricultural enterprises to household welfare

4.7.1 Whether agricultural enterprises improved household welfare

Table 4.10: Improvement in household welfare

Response	Frequency	Percentage
Yes	100	90.9
No	10	9.1
Total	110	100.0

Source: Field Research Findings, 2014.

The findings show that 90.9% of respondents reported that agricultural enterprises had improved their household welfare, while 9.1% reported no improvement.

This is one of the most important findings of the study. It suggests that urban agriculture was perceived by most respondents as contributing positively to household welfare.

The finding is consistent with recent evidence from Uganda. Ninsheka et al. (2024), studying Kampala and Mbarara, found a significant relationship between forms of urban agriculture and farmers' socioeconomic status.

Similarly, Kwiringira et al. (2024) found that urban agriculture contributes to food, income and employment in Kampala.

However, the present finding is based on respondents' perceptions and should not be interpreted as establishing a causal effect. Since households also had other sources of income, welfare improvements may have resulted from several livelihood activities.

4.7.2 Forms of welfare improvement

The reported welfare improvements included household income (36.4%), food security (36.4%), education (9.1%), clean water (9.1%) and improved housing (9.1%).



The results demonstrate that agricultural benefits extended beyond direct food consumption. Income earned from agricultural enterprises could be used to finance other household necessities, while food produced at home could reduce household expenditure on food.

This supports the livelihood perspective, in which agricultural activities contribute to welfare through several pathways, including direct consumption, income generation, asset accumulation and reduced household vulnerability.

4.8 Discussion of findings

4.8.1 Urban agriculture and household welfare

The findings demonstrate that urban agriculture was an important livelihood activity in Mbarara Municipality. The main enterprises included crop and livestock activities, with bananas, beans, maize, poultry and cattle being particularly important.

The findings are consistent with recent research in Uganda. Ninsheka et al. (2024), who studied Kampala and Mbarara, found that both subsistence and commercial forms of urban agriculture were associated with the socioeconomic status of urban farmers.

The findings are also consistent with evidence from Kampala showing that urban agriculture has evolved into a livelihood activity that supports food production, employment and income. Kwiringira et al. (2024) argue that urban agriculture should therefore be understood as part of the wider urban economy rather than solely as a survival strategy.

4.8.2 Contribution to food security and income

The finding that food security and household income were the leading welfare benefits indicates that urban agriculture served both consumption and economic functions.

This finding is important because urban households may be vulnerable to fluctuations in food prices and employment opportunities. Producing part of the household's food requirements can reduce dependence on markets, while selling surplus production provides cash income.



Recent evidence from Uganda supports this dual role. Ninsheka et al. (2024) found that urban agriculture contributed to household food and income security in Kampala and Mbarara.

4.8.3 Constraints to urban agricultural production

The major constraints identified in the study—poor technology, limited skills, inadequate inputs and marketing difficulties—show that the welfare contribution of urban agriculture is constrained by the resources available to farmers.

This finding remains relevant when compared with recent evidence. Ninsheka et al. (2024) identified land, technology and training as important constraints in Kampala and Mbarara.

The wider literature also shows that rapid urbanization can put agricultural land under pressure. Xie et al. (2021), in a systematic review of urban and peri-urban agriculture in the Global South, found that rapid urban growth can lead to the conversion of agricultural land and create challenges related to water, labour and access to productive resources.

Therefore, urban agricultural policy needs to consider farming within broader urban planning rather than treating it as an activity that occurs outside formal urban development.

4.8.4 Marketing and value addition

The findings indicate that farmers experienced inflation, transportation problems and competition. These constraints may reduce the income obtained from farming even when production is successful.

Urban farmers can potentially benefit from proximity to consumers, but this advantage depends on reliable market networks, transportation, storage and value addition. Recent research in Kampala similarly identifies the importance of market access and social networks in sustaining urban agricultural enterprises (Kwiringira et al., 2024).

The low proportion of respondents involved in processing suggests an opportunity for improving welfare through value addition. Processing agricultural products could increase shelf life, create employment and potentially improve returns.

4.8.5 Institutional support and extension services



The findings indicate that farmers required extension services, improved technologies, quality inputs, credit and collective marketing. These services could improve production and strengthen farmers' capacity to respond to constraints.

The findings are consistent with Ninsheka et al. (2024), who recommended improved extension services, credit and community networks for urban farmers in Kampala and Mbarara.

The implication is that municipal authorities should not view urban agriculture only from a regulatory perspective. They should also support productive activities through extension, training, market information, farmer organization and appropriate urban land-use planning.

4.8.6 Gender and participation

Although men constituted the majority of respondents, the absence of a significant relationship between sex and participation suggests that both men and women were involved in urban agriculture.

This finding should nevertheless be interpreted carefully. Equal participation does not necessarily mean equal access to land, capital, labour, technology or income. Future interventions should therefore incorporate gender-responsive approaches to ensure that women can benefit from urban agricultural opportunities.

4.8.7 Statistical interpretation and welfare impacts

The statistical results provide limited evidence of relationships between selected demographic characteristics and agricultural participation. The relationship between age and participation was weak and negative ($r = -0.194$, $p = 0.046$), while the relationship between sex and participation was effectively zero ($r = 0.000$, $p = 0.997$). Education also showed a weak negative relationship with participation ($r = -0.194$, $p = 0.035$).

These findings indicate that demographic characteristics alone do not provide a strong explanation for participation in urban agriculture.

The reported 90.9% of respondents who perceived an improvement in welfare provides descriptive evidence of the importance of urban agriculture. However, because the research was cross-sectional and relied partly on self-reported information, it cannot establish that agricultural enterprises caused the welfare improvements.

A stronger future analysis could estimate a regression model in which a welfare indicator such as household income, food security or welfare score is treated as the dependent variable, while



agricultural participation, enterprise type, farm size, access to credit, extension services, education, age and sex are independent variables. Such an analysis would provide stronger evidence about the factors associated with household welfare.

4.9 Limitations of the findings

Several limitations should be considered when interpreting the results.

First, the study relied substantially on self-reported information. Respondents may have experienced recall errors when reporting income, production and welfare changes. Some respondents may also have overstated or understated their agricultural returns.

Second, the field data were collected in **2014**, with the study's original time frame ending around 2015. Consequently, the findings describe the situation during the period of data collection and should not be presented as current statistics for Mbarara. The recent literature included in this chapter is therefore used to assess whether the observed patterns remain relevant rather than to replace the original field results.

Third, the study was conducted in Mbarara Municipality and therefore has limited generalizability to all urban areas in Uganda. Nevertheless, comparison with recent studies from Kampala and Mbarara provides evidence that several of the findings remain relevant.

Fourth, the cross-sectional design limits causal inference. The finding that 90.9% of respondents reported improved welfare through agriculture indicates a perceived association but does not prove that agriculture alone caused the improvement. Other income-generating activities, employment and household resources may also have contributed.

Finally, the sample size was relatively small. Although it provided useful information about the selected respondents, a larger sample covering more urban and peri-urban communities would provide stronger evidence for generalization.

4.10 Chapter summary

This chapter presented and discussed findings on urban agricultural enterprises and household welfare in Mbarara Municipality. The study found that households engaged in a range of crop and livestock enterprises, particularly bananas, beans, maize, poultry and cattle. Most enterprises were operated on a small scale.



The findings showed that urban agriculture contributed to household welfare through income generation, food security, education, housing and access to basic household needs. Overall, 90.9% of respondents reported that agricultural enterprises had improved their household welfare.

However, farmers faced several constraints, particularly poor technology, inadequate skills, limited inputs, inflation, transport difficulties and competition. The findings indicate that improved technologies, quality inputs, extension services, better livestock breeds, improved management practices, credit and collective marketing could strengthen the contribution of urban agriculture.

Comparison with recent evidence from Kampala and Mbarara indicates that the role of urban agriculture in food and income security remains relevant. Nevertheless, increasing urbanization, competition for land and changing market conditions require urban agriculture to be integrated more deliberately into urban planning and livelihood policies.

The findings should be interpreted with caution because the original data were collected in 2014 and relied partly on self-reported information. The study establishes important relationships and perceptions but does not demonstrate causal effects of urban agriculture on household welfare.

source should be 2015

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION

This chapter presents, analyses and discusses the findings on urban agricultural enterprises and their contribution to household welfare in Mbarara Municipality. The analysis follows the study objectives: identifying agricultural enterprises practiced, assessing their contribution to welfare, examining constraints faced by urban farmers, and examining measures used to improve agricultural production and household welfare. Quantitative findings are presented using frequencies, percentages and correlation results, while qualitative findings from interviews are used to explain and contextualize the quantitative results.

4.1 General Profile of Respondents

The study involved **110 respondents** who were engaged in urban agricultural activities in Mbarara Municipality. Their characteristics included gender, marital status, age, education level and occupation.

4.1.1 Gender of Respondents



Table 4.1: Gender of respondents

Gender	Frequency	Percentage
Male	70	63.6
Female	40	36.4
Total	110	100.0

Source: Field Research Findings, July 2014.

The findings show that males constituted 63.6% of the respondents, while females accounted for 36.4%. The higher participation of men suggests that men were more represented among the sampled urban farmers. However, the participation of women was also substantial, indicating that urban agriculture was not exclusively a male activity.

The finding is consistent with evidence that urban agriculture contributes to household food and income security and can provide particular economic and social benefits to women (Poulsen et al., 2015).

The correlation between gender and having an agricultural enterprise was negligible and statistically insignificant ($r = .000$, $p = .997$). Therefore, the data do not provide evidence that gender was associated with whether respondents had an agricultural enterprise.

4.1.2 Marital Status of Respondents

The majority of respondents were married (72.7%), followed by single respondents (18.2%), divorced respondents (6.4%) and widowed respondents (2.7%).

The predominance of married respondents may reflect the importance of household responsibilities and the need to diversify sources of food and income. However, marital status alone should not be interpreted as a direct cause of participation in urban agriculture because the study did not statistically test this relationship.

4.1.3 Age of Respondents

The largest proportion of respondents was aged 31–40 years (63.6%). Respondents aged 41 years and above accounted for 15.5%, those aged 21–30 years represented 11.8%, while respondents below 21 years accounted for 9.1%.



The results indicate that urban agriculture was predominantly practiced by economically active adults. This is important because urban agriculture can complement other livelihood activities rather than functioning solely as subsistence production. Evidence from Uganda similarly shows that agricultural households combine farming with employment, trade, transport and other livelihood activities (Mugisa et al., 2017).

The correlation between age and having an agricultural enterprise was negative and statistically significant ($r = -.194$, $p = .046$). Although the relationship was statistically significant at the 5% level, its magnitude was weak. It should therefore be interpreted as a weak association rather than a strong relationship.

4.1.4 Education Level of Respondents

The findings showed that 45.5% of respondents had primary education, 27.3% had secondary education, 9.1% had tertiary education, 9.1% had university education, while 9.1% had never attended school.

The results suggest that most respondents had at least some formal education. This could facilitate access to agricultural information, extension advice and market information. However, the study does not establish that education directly caused participation in urban agriculture.

The reported correlation between education and having an agricultural enterprise was $r = -.194$, $p = .035$, indicating a statistically significant but weak relationship. The result should therefore not be described as a strong correlation.

4.1.5 Occupation of Respondents

Table 4.2: Occupation of respondents

Occupation	Frequency	Percentage
Farmer	90	81.8
Employed	20	18.2
Total	110	100.0

Source: Field Research Findings, July 2014.

Most respondents (81.8%) identified farming as their main occupation, while 18.2% were employed in addition to farming. This demonstrates that urban agriculture served both as a primary livelihood activity and as a supplementary source of livelihood.



This finding is consistent with evidence from Central Uganda showing that urban and peri-urban crop farming can complement other livelihood sources, including livestock production, formal employment, transport and trade (Mugisa et al., 2017).

4.2 Agricultural Enterprises Practiced by Households

The first objective examined the agricultural enterprises practiced by people in Mbarara Municipality. The findings indicate that households combined crop and livestock enterprises, although the scale of production was generally small.

4.2.1 Livestock Enterprises

The main livestock enterprises were poultry, cattle, piggery and beekeeping. Poultry and cattle each accounted for 36.4% of respondents, piggery accounted for 18.2%, while beekeeping accounted for 9.1%.

The findings indicate that livestock keeping was an important component of urban agriculture. Poultry and cattle were particularly prominent because they can generate food, income and productive assets for households.

Recent evidence from Mbarara similarly identifies poultry, cattle, pigs and other livestock among the urban and peri-urban agricultural enterprises practiced by households.

4.2.2 Crop Enterprises

The major crop enterprises were matooke (45.5%), beans (18.2%), maize (18.2%), other crops (11.8%) and coffee (6.4%).

The dominance of matooke, beans and maize demonstrates the importance of food crops within urban and peri-urban farming systems. These crops can simultaneously contribute to household consumption and income generation.

The finding is supported by research from Central Uganda, where bananas, maize, beans and vegetables were among the major crops produced by urban and peri-urban farming households (Mugisa et al., 2017).



4.2.3 Other Sources of Income

Table 4.3: Other income sources

Source	Frequency	Percentage
Salaries/wages	50	45.5
Other sources	60	54.5
Total	110	100.0

Source: Field Research Findings, July 2014.

The findings show that 54.5% of respondents had other income sources, while 45.5% received salaries or wages. This confirms that urban farming formed part of a broader livelihood portfolio rather than operating in isolation.

This pattern supports the sustainable livelihoods perspective, under which households combine different assets and activities to reduce vulnerability and improve welfare. Evidence from Uganda also shows that farming households commonly combine agricultural and non-agricultural livelihood activities (Mugisa et al., 2017).

4.2.4 Systems Used in Crop Production

Table 4.4: Crop production systems

Production system	Frequency	Percentage
Small-scale	60	54.5
Semi-intensive	35	31.8
Extensive	15	13.6
Total	110	100.0

Source: Field Research Findings, July 2014.

More than half of respondents (54.5%) practiced small-scale production, while 31.8% used semi-intensive systems and 13.6% practiced extensive production.

The dominance of small-scale production is understandable in an urban environment where land is limited and competing demands for residential and commercial development are high. Recent research in Mbarara also identifies limited access to land as a major constraint to urban agriculture.



4.2.5 Production Techniques Used in Crop Enterprises

The main crop-production practices were pest and disease control (45.5%), early planting (36.4%) and other agronomic practices (18.2%).

The use of pest and disease control indicates farmers' attempts to improve productivity despite constraints associated with urban farming. Interview responses from extension workers similarly emphasized the importance of improved agronomic practices.

Evidence from Central Uganda indicates that irrigation, fertilizer application, home gardening techniques and improved agronomic practices are important components of urban crop production (Mugisa et al., 2017).

4.2.6 Systems Used in Livestock Production

Table 4.5: Livestock production systems

Production system	Frequency	Percentage
Small-scale	70	63.6
Semi-intensive	25	22.7
Extensive	15	13.6
Total	110	100.0

Source: Field Research Findings, July 2014.

Small-scale livestock production dominated, accounting for 63.6% of respondents. Semi-intensive systems accounted for 22.7%, while extensive systems accounted for 13.6%.

The predominance of small-scale livestock production reflects the need for urban farmers to adapt livestock enterprises to limited space. Such adaptation is also reported in Mbarara, where farmers use zero-grazing, small piggery units, tethering and poultry cages to accommodate livestock within restricted urban spaces.



4.2.7 Livestock Production Techniques

Table 4.6: Livestock production techniques

Technique	Frequency	Percentage
Housing	20	18.2
Feeding	70	63.6
Vaccination	20	18.2
Total	110	100.0

Source: Field Research Findings, July 2014.

Feeding was the most frequently reported livestock management practice (63.6%), followed by housing and vaccination at 18.2% each. The findings demonstrate that farmers recognized basic husbandry practices as important for livestock productivity.

4.2.8 Other Techniques Used

Marketing was the most frequently reported activity (54.5%), followed by transportation (27.3%), storage (9.1%) and processing (9.1%).

This suggests that urban agricultural production was connected to local markets. Proximity to urban consumers can provide farmers with market opportunities and reduce transportation distances, although market-related constraints can still limit profitability (Mugisa et al., 2017).

4.2.9 Income from Agricultural Enterprises

Crop income was most commonly reported within the range of 300,000–600,000, accounting for 45.5% of respondents. A further 27.3% reported 600,000ugx–900,000ugx, 18.2% reported 1,000,000 and above, while 9.1% reported 100,000ugx–300,000ugx.

For livestock, 45.5% reported incomes within the lower income category, 27.3% within 600,000ugx–900,000ugx, 18.2% at 1,000,000ugx and above, and 9.1% within 100,000ugx–300,000ugx.

These results suggest that agricultural enterprises provided an additional economic resource for households, although income levels varied considerably. This is consistent with evidence that urban agriculture can generate household income but that income alone may not always be sufficient to guarantee food security (Poulsen et al., 2015).



4.3 Contribution of Urban Agriculture to Household Welfare

The second objective assessed how agricultural enterprises contributed to household welfare.

4.3.1 Improvement in Household Welfare

Table 4.7: Agricultural enterprises and household welfare

Response	Frequency	Percentage
Yes	100	90.9
No	10	9.1
Total	110	100.0

Source: *Field Research Findings, July 2014.*

A large majority of respondents (90.9%) reported that agricultural enterprises improved household welfare, while 9.1% reported no improvement.

This is an important finding because it demonstrates that respondents perceived urban agriculture as contributing positively to their welfare. However, because the data are based on self-reported responses, the finding should be interpreted as evidence of **perceived welfare improvement**, rather than proof that agricultural production alone caused improvements in welfare.

The result is consistent with a systematic review showing that urban agriculture can improve food availability and dietary diversity and may provide household income, although the magnitude of these benefits varies among households (Poulsen et al., 2015).

4.3.2 Areas of Welfare Improvement

Respondents reported improvements in household income (36.4%), food security (36.4%), education (9.1%), clean water (9.1%) and housing (9.1%).



The results indicate two particularly important welfare pathways: **income generation and food security**. Agricultural production can reduce expenditure on food while surplus production can be sold to generate cash. In this way, agriculture can contribute both directly and indirectly to household welfare.

The findings are supported by evidence from Mbarara and other Ugandan urban areas. Research in Mbarara found that peri-urban farming contributes to food access, availability, stability and dietary diversity. Similarly, research in Kampala found that households engaged in home farming were more likely to perceive themselves as food secure.

4.4 Constraints Affecting Urban Agriculture

The third objective examined constraints faced by urban farmers.

4.4.1 Constraints in Crop Production

Table 4.8: Constraints in crop production

Constraint	Frequency	Percentage
Lack of skilled labour	30	27.3
Limited raw materials	20	18.2
Poor technology	60	54.5
Total	110	100.0

Source: Field Research Findings, July 2014.

Poor technology was the leading constraint, reported by 54.5% of respondents. Lack of skilled labour accounted for 27.3%, while limited raw materials accounted for 18.2%.

The finding is important because technology and knowledge can determine the productivity of urban farming systems, particularly where land and other resources are limited. Recent evidence from Kampala and Mbarara identifies inadequate improved technologies and training among the major constraints to urban agriculture.

4.4.2 Constraints in Livestock Production

Table 4.9: Constraints in livestock production



Constraint	Frequency	Percentage
Lack of skilled labour	35	31.8
Limited raw materials	15	13.6
Poor technology	60	54.5
Total	110	100.0

Source: Field Research Findings, July 2014.

Poor technology was again the dominant constraint (54.5%), followed by lack of skilled labour (31.8%) and limited raw materials (13.6%). The similarity between crop and livestock findings suggests that technological and knowledge constraints affected different forms of urban agriculture.

4.4.3 Marketing Constraints

For crop enterprises, inflation was the most frequently reported marketing problem (54.5%), followed by poor transportation (18.2%), other problems (18.2%) and competition (9.1%).

For livestock enterprises, inflation was reported by 45.5% of respondents, while poor transport and competition accounted for 27.3% each.

These findings demonstrate that producing agricultural commodities does not automatically translate into improved welfare. Farmers also need access to stable markets, reasonable prices and efficient transportation. The 2015 systematic review similarly found that urban agriculture can generate income, but income benefits are not necessarily sufficient to guarantee household food security.

4.5 Measures for Improving Agricultural Production

4.5.1 Measures for Improving Crop Production

The main measures reported by respondents were use of quality inputs (63.6%), pest and disease control (18.2%), manuring (9.1%) and early planting (9.1%).

The results show that farmers recognized the importance of production inputs and improved agronomic practices. However, the high proportion reporting poor technology as a constraint suggests a gap between awareness of improved practices and actual access to the technologies required to implement them effectively.



4.5.2 Measures for Improving Livestock Production

The main measure was the use of improved breeds (54.5%). Feeding accounted for 9.1%, while housing and disease and pest control each accounted for 18.2%.

Improved breeds can increase productivity when accompanied by adequate feeding, housing, disease control and technical support. Consequently, livestock improvement programmes should address the production system as a whole rather than focusing on breeds alone.

4.6 Discussion of Findings

4.6.1 Urban Agricultural Enterprises and Household Welfare

The findings demonstrate that urban agriculture was an important livelihood activity among sampled households in Mbarara Municipality. Crop and livestock enterprises provided food and income and were combined with other economic activities.

The finding is consistent with the wider evidence base. A 2015 systematic review concluded that urban agriculture can improve food availability and dietary diversity and can contribute to household income, although the benefits vary across households and contexts (Poulsen et al., 2015).

Evidence from Uganda provides further support. Research in Central Uganda found that crop farming contributed an average of 40% of farming households' income and complemented other livelihood activities such as livestock production, formal employment, transport and trade (Mugisa et al., 2017).

The Mbarara findings are also comparable with research in Kampala. Pottier (2015) found that access to agricultural land was important for year-round urban food security and that many households farming at home perceived themselves as food secure.

4.6.2 Comparison with Other Ugandan Urban Areas

The results from Mbarara are broadly consistent with findings from other Ugandan municipalities and urban areas. Studies in Kampala, Wakiso and Masaka show that urban and peri-urban farming contributes to income, food production and household livelihood diversification (Mugisa et al., 2017).



Similarly, evidence from Mbarara shows that farmers use limited spaces creatively through backyard gardens, roadside production, containers, sacks and other space-saving approaches. Livestock farmers also adapt through zero-grazing, small piggery units and poultry production.

Thus, the present findings fit a wider Ugandan pattern in which urban agriculture functions as a flexible livelihood strategy under conditions of limited land, employment uncertainty and food-price pressures.

4.6.3 Constraints Affecting Urban Agriculture

The major constraints identified in the study were poor technology, lack of skilled labour, limited inputs, inflation, transportation difficulties and competition.

These constraints are not unique to Mbarara. Evidence from urban and peri-urban Uganda identifies land scarcity, limited access to credit, labour constraints, water shortages, inputs, pests and diseases and inadequate markets as major challenges.

The comparison suggests that constraints operate at several levels. At the household level, farmers face limited capital, labour and technical knowledge. At the production level, farmers face land, water, input and technology constraints. At the market level, farmers face transportation, price and competition problems.

4.6.4 Measures for Addressing Constraints

The findings indicate that farmers relied on improved inputs, better agronomic practices, improved livestock breeds, feeding, housing, disease control and marketing. Interview responses also emphasized extension services and collective marketing.

These measures are appropriate because urban agriculture requires both production and institutional support. Recent evidence from Kampala and Mbarara recommends community networks, credit and subsidies and additional extension personnel to strengthen urban agriculture.

The findings therefore suggest that improving urban agriculture requires more than encouraging households to farm. Municipal authorities need to integrate urban agriculture into planning, improve access to extension services and technologies, facilitate markets and support appropriate forms of small-scale production.

4.6.5 Relationship Between Urban Agriculture and Welfare



The descriptive findings show that 90.9% of respondents perceived an improvement in household welfare as a result of agricultural enterprises. The reported improvements were mainly in income and food security.

The correlation results also show that demographic characteristics were associated with participation in agricultural enterprises, although the observed relationships were weak. Age had a statistically significant negative correlation with having an agricultural enterprise ($r = -.194$, $p = .046$), while education also showed a weak statistically significant relationship ($r = -.194$, $p = .035$). Gender showed no significant relationship ($r = .000$, $p = .997$).

These results should be interpreted cautiously. Correlation does not demonstrate causation, and the study did not have sufficient evidence to conclude that age or education directly caused changes in welfare.

A stronger assessment of welfare impacts would require a multivariate model incorporating household income, food-security indicators, enterprise type, farm size, access to credit, extension services, gender, age and education. Such analysis could help determine whether urban agriculture remains significantly associated with welfare after controlling for household characteristics.

4.7 Limitations of the Findings

The findings should be interpreted in light of several limitations.

First, much of the information on household welfare was **self-reported**. Respondents reported whether they believed agricultural enterprises had improved their welfare, income and food security. Such responses may be affected by recall errors or respondents' perceptions.

Second, the study was based on a **cross-sectional design**, meaning that data were collected at one point in time. Consequently, the study identifies associations and reported experiences but cannot conclusively establish that urban agriculture caused improvements in welfare.

Third, the study focused on the period ending around **2014/2015**. Therefore, the findings represent the conditions at the time of the original fieldwork and should not automatically be interpreted as describing the current situation in Mbarara.

Fourth, the study relied on a relatively small sample of 110 farmer respondents for the quantitative analysis. Although this provided useful information, larger samples covering additional urban and peri-urban areas could provide stronger generalizability.



Finally, some of the original statistical results contain inconsistencies in the reported sample sizes and interpretation of correlation coefficients. In particular, statistically significant correlations with coefficients of approximately -0.194 should be described as **weak**, rather than strong. The revised interpretation therefore emphasizes the direction and statistical significance of the relationships without overstating their magnitude.

4.8 Summary of the Findings

The study found that urban agriculture in Mbarara Municipality involved both crop and livestock enterprises, with matooke, beans, maize, poultry and cattle being particularly prominent. Most farmers operated on a small scale and combined agriculture with other livelihood activities.

A large majority of respondents reported that agricultural enterprises improved household welfare. The main welfare benefits were improved household income and food security, with additional benefits reported in education, housing and access to clean water.

The major constraints were poor technology, lack of skilled labour, limited inputs, inflation, poor transportation and competition. Farmers responded through improved inputs, pest and disease control, improved livestock breeds, better feeding and housing, and marketing activities.

Comparison with evidence from other Ugandan urban areas shows that the Mbarara findings are broadly consistent with the wider pattern: urban agriculture can contribute to food security, income and livelihood diversification, but its benefits are constrained by limited land, technology, finance, skills and market access.

Overall, the findings support the view that urban agriculture should be considered a component of urban livelihood and food-security strategies. However, its contribution should not be overstated because the present evidence is largely based on self-reported outcomes and a cross-sectional study conducted during the earlier study period.



5.0 Summary, Conclusions and Recommendations

5.1 Summary of Findings

5.1.1 Urban agriculture and people's welfare in Mbarara Municipality, Mbarara District

According to the findings from this survey, urban agriculture was present and common in Mbarara Municipality, with 92.5% of respondents indicating that they had knowledge of or experience with urban agriculture. This was reported by political leaders, extension staff, and most of the farmers who participated in the study. Urban agricultural enterprises included individual farmers, farmer groups, and associations formed around common agricultural interests. Furthermore, the findings showed that 58.2% of respondents participated in urban agricultural enterprises and belonged to various farmer groups. These included farmers and political leaders who also engaged in agricultural activities.

The findings suggest that urban agriculture was an important livelihood activity within the municipality. This is consistent with recent evidence that urban and peri-urban agriculture can contribute to household food access, income generation, livelihood diversification, and resilience, particularly where households have limited access to formal employment (Food and Agriculture Organization of the United Nations [FAO], 2022, 2023; Sangwan & Tasciotti, 2023). Urban agriculture can also contribute to local food systems by linking producers to nearby consumers and markets. However, the contribution to welfare depends on access to land, inputs, finance, extension services, and markets.

The findings therefore indicate that urban agriculture should not be viewed only as a subsistence activity. It also has potential as an economic activity that can support household welfare and contribute to the food supply of a growing municipality. This supports the broader argument that urban food production should be incorporated into local food-system planning and urban development strategies (FAO, 2023).

5.1.2 The role of urban agriculture and people's welfare in the study area

The research established several roles played by urban agricultural enterprises in improving people's welfare. Findings revealed that 90.2% of respondents agreed that urban agricultural



enterprises had contributed significantly to household welfare. The reported benefits included overcoming individual limitations through collective action, teamwork, improved access to extension services and agricultural inputs, access to market information and agricultural technologies, access to credit and saving services, and the pooling of resources among farmers.

From the study conducted in Mbarara Municipality, agricultural enterprises helped farmers access inputs, extension services, agricultural technologies, credit and savings services, thereby contributing to household welfare. These findings are consistent with recent literature showing that participation in agricultural and food-production activities can strengthen household livelihood strategies when farmers have access to productive assets and institutional support (Fraval et al., 2018; Mohammed et al., 2020).

The findings also demonstrate the importance of collective action. Farmer organizations can reduce some of the limitations faced by individual producers by enabling members to share resources, obtain information, access services, and improve their bargaining position. Such collective approaches are particularly important in urban settings where land and other productive resources are limited and where farmers must compete with alternative urban land uses.

The welfare contribution of urban agriculture was reflected particularly in household income and food security. The results indicated that agricultural enterprises provided households with food for consumption and products for sale. This finding is supported by Sangwan and Tasciotti (2023), who found that urban agriculture can influence household food expenditure and dietary diversity, although the strength of the relationship varies across contexts. Therefore, urban agriculture can make an important contribution to welfare, but its effects should be understood within the wider livelihood and food-system environment.

5.1.3 Challenges faced by urban agricultural farmers and their implications for welfare in Mbarara Municipality

The findings revealed several challenges affecting urban agricultural enterprises and their ability to improve household welfare in Mbarara Municipality. These included inadequate financial resources, limited access to appropriate technologies, shortages of skilled labour, limited raw materials and inputs, marketing difficulties, transportation problems, competition, inflation, and constraints associated with access to productive land.

The majority of respondents, representing 84.2%, strongly agreed that inadequate financial resources were a major challenge affecting urban agricultural enterprises, while 20.8% agreed that inadequate funds constrained agricultural activities. These findings demonstrate that access to finance remains an important factor influencing the ability of urban farmers to expand production and improve welfare.



Recent studies similarly show that urban and peri-urban farmers often face structural constraints related to access to land, finance, productive inputs, markets and technical knowledge (FAO, 2022; Mohammed et al., 2020). These constraints are particularly significant in rapidly expanding urban areas because agricultural land is increasingly exposed to competing demands from housing, commercial development and infrastructure.

Technology was also identified as an important constraint in the study. Poor production technology limits productivity and may reduce the ability of farmers to respond to market opportunities. This indicates that improving welfare through urban agriculture requires more than encouraging farmers to produce. It requires appropriate technologies, extension services, affordable inputs, financial services, market information and business development support.

The findings on marketing constraints are also significant. Inflation, poor transport facilities and competition affected farmers' ability to obtain favourable returns from their agricultural products. Urban farmers may have geographical proximity to consumers, but proximity alone does not guarantee profitable market participation. Farmers require reliable market information, appropriate transportation, product quality, collective marketing arrangements and opportunities for value addition.

5.1.4 Suggestions for overcoming challenges faced by urban agricultural enterprises in Mbarara Municipality

The results indicated that improved transparency and accountability among farmers could contribute to addressing some of the challenges affecting urban agricultural enterprises. A total of 72 respondents, representing 61.7%, strongly agreed, while 54 respondents, representing 36.7%, agreed that transparency and accountability were important for strengthening agricultural enterprises.

The findings further showed that effective leadership was considered important in addressing challenges affecting urban agricultural enterprises. A total of 59.2% of respondents strongly agreed that effective leadership could provide a solution to challenges affecting agricultural enterprises, while 37.5% agreed.

These findings emphasize the importance of organizational capacity in farmer groups. Recent approaches to sustainable urban food systems similarly emphasize collaboration among farmers, communities, local authorities, development organizations and other actors (FAO, 2023). Effective leadership can facilitate collective marketing, access to services, accountability in the management of group resources and communication between farmers and local authorities.



Advocacy is therefore an important additional strategy. Farmers and their organizations need to advocate for recognition of urban agriculture in municipal development and land-use planning. Municipal authorities can support this process by creating an enabling policy environment, identifying appropriate spaces for agricultural production, improving extension services, facilitating access to finance and strengthening market infrastructure. Such an approach is consistent with the FAO's emphasis on local-government action and integrated urban food-system planning (FAO, 2022, 2023).

5.2 Conclusion

The survey found that the quantities of food products supplied by urban and peri-urban farmers were less than the quantities demanded by traders, including small kiosks specializing in fruits and vegetables. This suggests that urban farmers face two alternatives: to confine themselves to local or niche production that they can supply with their present production levels, or to move towards collective action as a means of supplying greater volumes to markets that indicate possibilities for growth.

The study shows that urban farmers were aware of options such as poultry, piggery and mushrooms that represent relatively high value given the limitations of assets such as land, purchased inputs and capital. These enterprises may also be less risky than some alternatives that require larger amounts of land and investment. The move towards higher-value options that increase returns per unit of land would therefore need to be accompanied by appropriate services, including access to inputs, technical assistance, finance and contact with potential buyers.

The findings also indicate that the welfare benefits of urban agricultural enterprises extend beyond production. Agricultural enterprises can provide food for household consumption, generate income, create employment opportunities and support access to education, housing and other household needs. However, the extent of these benefits is influenced by production constraints, access to markets and the ability of farmers to participate effectively in urban food systems.

The study further found that agricultural products produced in Mbarara Municipality could compete with products obtained from other districts, particularly where farmers were able to meet market requirements concerning quantity, quality, continuity and price. Poultry products and mushrooms represented opportunities where farmers could meet several market requirements, while vegetables and fruits had potential for expansion if farmers could improve production volume and continuity.

The findings therefore suggest that urban agricultural enterprises have potential to contribute to household welfare, but this potential is constrained by limited productive resources, inadequate finance, technological limitations and market challenges. Urban agriculture should consequently



be treated as part of the wider urban food and livelihood system rather than as an isolated agricultural activity.

5.2.1 Opportunities for peri-urban agricultural enterprises and transition of farmers

Peri-urban farmers are relatively well placed to make use of opportunities that require land as a principal input, including dairy, piggery, fruits and vegetables. However, farmers living in areas experiencing peri-urban transition face increasing pressure from urban expansion. The availability of agricultural land may decline as residential, commercial and infrastructure development expands.

The transition from agricultural to non-agricultural land uses therefore requires careful planning. Urban expansion can create both opportunities and threats for peri-urban farmers. While proximity to urban consumers can increase market opportunities, land conversion can reduce the productive base on which agricultural livelihoods depend. Recent research emphasizes the importance of considering land-use change, food production and urban development together when planning sustainable urban food systems (FAO, 2022; Hemerijckx et al., 2025).

Farmers in peri-urban areas should therefore be supported to adopt enterprises that provide higher returns from limited land. At the same time, municipal authorities should incorporate agricultural land and food production into urban planning processes where appropriate.

5.2.2 Opportunities for urban agricultural enterprises and transition of farmers

Urban farmers were open to new opportunities for improving their welfare. However, the study had limited success in identifying alternative products beyond mushrooms and poultry that could provide high value and quick returns on investment while requiring relatively small areas of land.

Overall, the study has shown that demand for products from urban agricultural enterprises for the urban population is growing in Mbarara Municipality. This is expected given the growth of the urban population and increasing demand for food. Recent evidence confirms that urbanization is transforming food systems and increasing the importance of connections between rural, peri-urban and urban food production and consumption (FAO, 2023).



Urban agriculture therefore presents opportunities for strengthening local food systems. Nevertheless, these opportunities require appropriate policy support, market organization, investment in technologies and stronger links between producers and consumers.

5.3 Recommendations

As mentioned in the introduction, this study is part of an explanatory and information-gathering process whose results could form the basis of a wider proposal to support urban and peri-urban agricultural enterprises in Mbarara Municipality. The findings show that urban farmers in Mbarara Municipality are market-oriented and that there are opportunities for growth in their enterprises and welfare. However, there are several obstacles that need to be addressed.

To achieve improved welfare, farmers would benefit from appropriate support services. At present, services either do not exist or are oriented more towards production, with less attention being paid to marketing and enterprise organization. The inter-institutional and multidisciplinary nature of urban agriculture requires cooperation among local government, agricultural extension services, farmer organizations, financial institutions, researchers, civil-society organizations and private-sector actors.

Market information should be strengthened and focused on urban farming groups to assist farmers in deciding which crops and livestock products to produce, when to produce them and where to sell them. Better access to reliable market information can help farmers respond to demand and reduce losses associated with poor market coordination.

Microfinance and other appropriate financial services should be strengthened to support expansion of production and the creation of new enterprises. Financial institutions and municipal development programmes should consider affordable credit products that recognize the characteristics of small-scale urban farmers.

Technical and business extension services should also be strengthened. Extension should not focus exclusively on production but should incorporate farm management, business planning, value addition, record keeping, post-harvest management, quality standards and marketing. FAO (2022, 2023) emphasizes the importance of integrated support across the food system rather than focusing only on production.

A supportive legal and policy framework should be developed to encourage appropriate and environmentally sustainable agricultural activities in urban settings. Municipal authorities should consider urban agriculture in land-use planning and development policies while ensuring that agricultural activities do not create avoidable environmental or public-health risks.



Support should also be provided to farmer organizations to strengthen collective action in marketing and the provision of essential services such as inputs, extension and finance. Collective marketing can enable farmers to aggregate products, improve bargaining power and respond to buyers who require larger and more consistent quantities.

Advocacy should be integrated into these interventions. Farmer groups should be supported to engage municipal authorities in policy dialogue concerning access to land, water, extension services, markets and financial services. Advocacy can help ensure that the contribution of urban agriculture to food security, employment and household welfare is recognized within municipal development planning.

A follow-up intervention could operate at two levels. The first could involve pilot projects in selected parishes where contact was made during the explanatory phase to increase the competitiveness of selected urban agricultural enterprises. These products would provide a learning ground for local service providers that could subsequently expand successful approaches to other areas of the municipality. The second level could involve the design and implementation of a wider intervention to strengthen key enterprise-support services at parish or division level, taking into account the assets of each area and the dynamics of land-use change.

5.4 Areas of Further Research

The researcher recommends that further research should be conducted on urban agricultural enterprises and household welfare at household level. Future studies should examine differences among households because food security and welfare are determined by multiple factors. It is therefore important to investigate the specific constraints faced within different urban agricultural enterprise categories rather than relying only on aggregate comparisons.

Further studies should also examine gender differences in participation, control over agricultural resources, income generation and decision-making. Comparing men and women only at the aggregate level may conceal important differences in access to land, credit, markets, extension services and household decision-making.

There are still limited empirical studies in Uganda examining the relationship between urban agricultural enterprises, household livelihoods and welfare, particularly in secondary cities. More household-level studies should therefore be conducted in these settings because urbanization and food-system transformation continue to influence household welfare.



Future research should also use more analytical designs to examine the relationship between participation in urban agriculture and household welfare. Correlation and regression analysis could be used to assess whether participation in urban agriculture is statistically associated with indicators such as household income, food security, dietary diversity, education expenditure and housing conditions. Such analysis would provide stronger evidence than descriptive statistics alone.

Future studies should also consider longitudinal designs to establish whether changes in participation in urban agriculture are associated with changes in household welfare over time. This would help address an important limitation of the present study, which relied substantially on cross-sectional and self-reported information.

Finally, future research should examine the effects of municipal policies and advocacy on urban agriculture. Particular attention should be given to how municipal planning, land-use regulations, extension services, farmer organizations, access to finance and market-support programmes influence the sustainability of urban agricultural enterprises. This would provide evidence for more effective urban food-system policies in Mbarara and other secondary cities in Uganda.

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