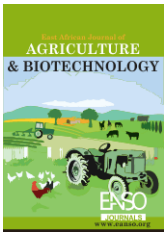

East African Journal of Agriculture and Biotechnology
eajab.easno.org
Volume 8, Issue 1, 2025
p-ISSN: 2707-4293 | e-ISSN: 2707-4307
Title DOI: https://doi.org/10.37284/2707-4307

EAST AFRICAN NATURE & SCIENCE ORGANIZATION

Original Article

Theoretical Perspective of Urban Farming and Food Security in Southwestern Uganda

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Article DOI : https://doi.org/10.37284/eajab.8.1.2848

Date Published:
09 April 2025

Keywords:
Urban Farming, Food Security, Community Empowerment, Socio-Economic Status.

ABSTRACT

This study examined the potential of urban agriculture as a strategy to alleviate food insecurity among low-income households in urban areas of southwestern Uganda. As rapid urbanization challenges traditional food systems to meet increasing demand for affordable and nutritious food, urban agriculture offers a promising solution. By using limited urban spaces to grow crops, urban agriculture can increase food access and provide economic benefits. Drawing on secondary data from government reports, academic research, policy documents and case studies, the study examined the role of urban agriculture in improving food security, promoting community empowerment and generating income through market-oriented gardening. The study suggests that households practising urban farming have better access to diverse and nutritious foods compared to households in peri-urban and rural areas. However, constraints such as land scarcity, inadequate water management, limited technical knowledge and inadequate policy support hinder the full potential of urban agriculture. The study highlighted the need for integrated urban policies that support sustainable food systems and community-based agricultural programs. By promoting innovative farming techniques and optimizing the use of space, urban farming can serve as a scalable model for building resilient urban food systems in southwestern Uganda.

APA CITATION

Atuhaire, M. T., Adyanga, A. F. & Ocan, J. (2025). Theoretical Perspective of Urban Farming and Food Security in Southwestern Uganda. *East African Journal of Agriculture and Biotechnology*, *8*(1), 184-194. https://doi.org/10.37284/eajab.8.1.2848

CHICAGO CITATION

Atuhaire, Mary Tibamanya, Akena Francis Adyanga and Johnson Ocan. 2025. "Theoretical Perspective of Urban Farming and Food Security in Southwestern Uganda". *East African Journal of Agriculture and Biotechnology* 8 (1), 184-194. https://doi.org/10.37284/eajab.8.1.2848

Article DOI : https://doi.org/10.37284/eajab.8.1.2848

HARVARD CITATION

Atuhaire, M. T., Adyanga, A. F. & Ocan, J. (2025) "Theoretical Perspective of Urban Farming and Food Security in Southwestern Uganda", *East African Journal of Agriculture and Biotechnology*, 8(1), pp. 184-194. doi: 10.37284/eajab.8.1.2848.

IEEE CITATION

M. T. Atuhaire, A. F. Adyanga & J. Ocan "Theoretical Perspective of Urban Farming and Food Security in Southwestern Uganda", *EAJAB*, vol. 8, no. 1, pp. 184-194, Apr. 2025.

MLA CITATION

Atuhaire, Mary Tibamanya, Akena Francis Adyanga & Johnson Ocan. "Theoretical Perspective of Urban Farming and Food Security in Southwestern Uganda". *East African Journal of Agriculture and Biotechnology*, Vol. 8, no. 1, Apr. 2025, pp. 184-194, doi:10.37284/eajab.8.1.2848

INTRODUCTION

Food security remains a significant challenge in Sub-Saharan Africa, particularly in rapidly urbanizing regions such as South Western Uganda. This region faces a high population density of 991 people per square kilometre, creating immense pressure on local food systems (Kishaija *et al.*, 2024). As urbanization continues to accelerate, traditional food supply chains struggle to meet the increasing demand for affordable and nutritious food. Consequently, urban households, especially those with low incomes, experience food insecurity due to limited access to food and economic opportunities (Leonard *et al*. 2024).

Urban farming is gaining traction as a potential solution to these food security challenges. Defined as the practice of cultivating food within or near urban areas, urban farming allows households to utilize limited spaces to grow crops, rear animals, and diversify their diets (Foeken & Mwangi, 2000). It not only supplements the food supply but also creates economic opportunities for urban dwellers. Studies have shown that urban farming can lead to improved food access, increased dietary diversity, and enhanced income generation (Abdillah *et al*. 2023; Mekonen, Berlie, and Kassie 2023).

South Western Uganda is experiencing rapid urbanization, characterized by the growth of major cities such as Mbarara, Kabale, and Kisoro, along with smaller municipalities like Bushenyi, Ntungamo, and Rukungiri. This region is known for its fertile soils, favourable climate, and significant agricultural productivity, which have historically supported the food security of its rural communities. However, with urban populations expanding, the demand for food within urban centres is rising, putting pressure on traditional food supply chains and creating new challenges for food security (Tumwesigye *et al*. 2023).

The urbanization rate in South Western Uganda has significantly increased over the past two decades. Mbarara, for example, has grown from a small trading centre into a bustling city and is now a major economic hub in the region. This rapid urban growth has led to changes in land use patterns, with agricultural lands increasingly being converted for residential, commercial, and industrial purposes (Nuwagira *et al.*, 2023). In Kabale, the steep terrain and limited flatlands exacerbate the challenges of food production, making access to fresh and nutritious food a challenge for urban households (Leonard *et al*., 2024).

Despite the agricultural potential of South Western Uganda, most urban centres in the region rely heavily on rural agricultural outputs, which are subject to various vulnerabilities such as price fluctuations, climate variability, and transportation challenges (Omona, 2023). This dependence on rural supplies creates a fragile food system that is particularly susceptible to disruptions. Urban households, especially those in low-income communities, face challenges in accessing a consistent and affordable supply of food, resulting in increased food insecurity (Mekonen *et al.* 2023)

In response to these challenges, urban farming has emerged as a potential strategy to enhance food

Article DOI : https://doi.org/10.37284/eajab.8.1.2848

security in South Western Uganda's urban centres. Urban farming involves the cultivation of crops and the rearing of livestock within city limits or nearby peri-urban areas (Kayusi *et al.,* 2024). This practice offers several advantages, including the ability to utilize underused urban spaces, improve access to fresh produce, and generate income for urban households (Foeken & Mwangi, 2000). Urban farming has been identified as a way to supplement the food supply within urban areas, particularly for low-income households that struggle to afford food from formal markets (Leonard *et al.,* 2024).

Mbarara and Kabale have shown early indications of the benefits of urban farming, with local initiatives encouraging rooftop gardening, community gardens, and market-oriented urban agriculture. In Kisoro, where urbanization is driven by its proximity to the Democratic Republic of Congo and tourism in Bwindi and Mgahinga national parks, urban farming has played a role in supplying food to hospitality businesses (Nasinyama *et al.,* 2010). However, the potential of urban farming in these centres is constrained by challenges such as land scarcity, inadequate water supply, and limited technical knowledge (Nuwagira *et al.,* 2023).

Urban farming's role in addressing food insecurity lies in its capacity to provide direct access to food, reduce dependence on rural food systems, and create economic opportunities through the sale of surplus produce. By tapping into the existing agricultural potential and addressing the constraints, urban farming could significantly contribute to enhancing food security in South Western Uganda's urban areas. This sets the stage for a deeper exploration of how urban farming can be integrated into urban planning and policy frameworks to create resilient and sustainable food systems in the region.

LITERATURE REVIEW

Theoretical Review

Intersectionality and Social Risk Management Theory

Urban farming and food security can be analyzed through the lenses of intersectionality and social risk management theory. Intersectionality, initially developed by Kimberlé Crenshaw, focuses on how different social identities such as gender, class, and ethnicity intersect to create unique experiences of advantage and disadvantage (Crenshaw, 2021). In the context of urban farming, intersectionality helps us understand how social identities and power dynamics influence access to resources like land, water, and agricultural knowledge. Studies have shown that gender disparities can significantly impact women's participation in urban agriculture, limiting their access to capital, land, and decision-making spaces (Nasinyama *et al.,* 2010). Therefore, recognizing these intersecting identities is crucial for creating inclusive policies that empower marginalized groups in urban farming initiatives.

Social risk management theory views urban farming as a risk mitigation strategy for vulnerable populations. This theory emphasizes the need for proactive strategies to manage socio-economic risks, including income instability, unemployment, and food insecurity (Holzmann & Jørgensen, 2001). Urban farming can be perceived as one such strategy, allowing urban dwellers to diversify their livelihoods and secure direct access to fresh produce. From our perspective, this theory resonates with the context of South Western Uganda, where many families face economic uncertainties. Emphasizing urban agriculture as a risk management tool could pave the way for policies that support community resilience in the face of socio-economic challenges (Turyasingura *et al.,* 2024). Andyanga and Ocan (2024) build on this theory by suggesting that local policy frameworks should focus on mitigating risks for vulnerable communities through sustainable urban agriculture practices.

Empirical Review

Urban Farming's Socio-Economic and Environmental Implications

Article DOI : https://doi.org/10.37284/eajab.8.1.2848

Urban farming has been increasingly recognized for its socio-economic benefits, including income generation, improved food security, and community empowerment. According to (Leonard *et al.*,, 2024), urban farming plays a critical role in enhancing the socio-economic status of urban households by creating income-generating opportunities and improving dietary diversity. The sale of surplus produce provides households with additional income that can be used to meet other essential needs. Similarly, (Mekonen *et al.*, 2023) found that urban farming improves food availability and access, particularly in low-income urban areas where food insecurity is prevalent.

From an environmental perspective, urban farming helps promote sustainable land use and waste management. Foeken and Mwangi (2000) highlight the potential of urban agriculture to utilize underused spaces, such as rooftops and vacant lots, to cultivate crops and reduce environmental degradation (Foeken and Mwangi, 2000). Additionally, modern farming methods like hydroponics and aquaponics offer innovative solutions to urban food security by maximizing production in limited spaces (Dos Santos, 2016). These methods align with current studies in green financing and sustainability, as urban farming presents an innovative solution to environmental challenges faced in rapidly urbanizing areas. However, challenges such as land scarcity, water shortages, and inadequate technical support continue to hinder the widespread adoption of these practices in rapidly urbanizing regions like South Western Uganda (Nasinyama *et al.*, 2010).

Food Security in Sub-Saharan Africa and Urbanization

Urbanization in Sub-Saharan Africa has created new challenges for food security, particularly in rapidly growing cities. The migration of rural populations into urban areas has resulted in increased competition for limited resources, such as land, water, and food. This has contributed to rising food prices, increased dependency on rural food supplies, and greater vulnerability to food insecurity (Maxwell, 1999). It becomes clear that we must advocate for integrated solutions that prioritize both urban and rural food systems. Additionally, other researchers emphasized the importance of sustainable land utilization to support economic sustainability and food security in rapidly urbanizing regions (Ahereza et al., 2024)

Studies have examined the impact of urban agriculture on food security in Sub-Saharan Africa. Zezza and Tasciotti (2010) argue that urban agriculture plays a crucial role in alleviating poverty and improving food security by providing direct access to fresh and nutritious produce. Their research shows that urban farmers are more likely to consume a variety of fruits and vegetables, thereby improving their dietary diversity and nutrition outcomes (Zezza & Tasciotti, 2010). This underscores the potential of urban farming to address not only food security but also public health concerns. Further, (Lubaale et al., 2024) explored the socio-economic implications of smallholder farming in Uganda, highlighting the need for integrated approaches that consider local food production, distribution networks, and policy support.

In South Western Uganda, urban farming presents an opportunity to address food security challenges by reducing dependency on fragile rural food systems. (Omona, 2023) explored how climate change affects food production in urban centres, underscoring the need for resilient food systems that incorporate urban agriculture as a key component. It is envisioned that incorporating climate-resilient practices into urban farming can significantly bolster food security in our region. As urbanization continues to expand, there is a growing recognition of the need for supportive policies that integrate urban farming into broader urban planning frameworks to promote food security and economic sustainability (Raja *et al.*, 2024).

METHODOLOGY

Article DOI : https://doi.org/10.37284/eajab.8.1.2848

This study used document review approach to explore the implications of urban farming on food security in South Western Uganda. The research focuses on examining existing data sets, reports, and literature to understand the relationship between urban farming practices and food security outcomes in rapidly urbanizing regions. Secondary data analysis provides a cost-effective and time-efficient way to draw inferences from previously collected data (Szabo and Strang, 1997), allowing for a broader understanding of the topic within the given scope.

Key sources of data included publications from the Uganda Bureau of Statistics (UBOS), the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), and reports from local government authorities in South Western Uganda. Additionally, scholarly articles and case studies on urban farming and food security in Sub-Saharan Africa were reviewed to provide a theoretical foundation for the study.

The secondary data were collected and systematically reviewed to extract relevant information on urban farming practices, socio-economic factors, food security indicators, and urbanization trends. This information was organized according to thematic areas such as land access, food production, income generation, and policy support. A comprehensive literature review provided context and theoretical grounding for the study's analysis, helping to identify patterns and gaps in the existing literature.

Since the study is based on secondary data, the sampling strategy involved selecting relevant documents and data sets that provide insights into urban farming and food security in South Western Uganda. The selection criteria were based on the following factors:

The study focused on data specific to key urban centres in South Western Uganda, including Mbarara, Kabale, Kisoro, Bushenyi, Ntungamo, and Rukungiri. These urban centres were chosen due to their rapid urbanization, diverse socio-economic activities, and varying agricultural potentials.

Only data sets and studies that directly addressed urban farming practices, food security indicators, and urban socio-economic dynamics were included. Reports and documents that provided statistical data on population growth, land use, and agricultural productivity were also reviewed.

The data analysis involved a combination of qualitative and quantitative methods to synthesize and interpret the secondary data. A thematic analysis approach was used to identify recurring themes and patterns in the qualitative data. For example, reports and case studies were examined to understand how urban farming practices have influenced food access, income levels, and dietary diversity in various urban centres of South Western Uganda. Thematic coding was conducted to categorize the findings into key themes such as food production, land use challenges, and socio-economic impacts of urban farming.

For the quantitative data, descriptive statistical techniques were employed to summarize key indicators related to food security and urban farming. This included analyzing trends in urban population growth, land conversion rates, food price fluctuations, and income levels of households engaged in urban farming. Where applicable, statistical tables and charts from existing reports were referenced to support the findings and provide a clearer understanding of the relationships between the variables.

The choice of secondary data analysis is justified by the availability of extensive existing research and official reports on urban agriculture and food security in Uganda. By utilizing these data sources, the study can provide a comprehensive analysis without the need for primary data collection, which would require considerable resources and time. Additionally, secondary data allow for cross-referencing and validation of findings from different

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sources, strengthening the reliability and validity of the study's conclusions.

Impact of Urban Farming on Food Security

Urban farming has shown a positive impact on food security in South Western Uganda, particularly in rapidly urbanizing cities like Mbarara and Kabale. The reviewed data suggest that households practising urban farming report increased food availability and improved dietary diversity (Leonard et al., 2024). This is significant because it implies that urban farming is not merely a supplementary activity but a critical component in achieving food security for low-income households (Chavula & Turyasingura, 2022). By cultivating crops within city limits, households gain direct access to fresh produce, reducing their dependence on fluctuating market prices and vulnerable supply chains (Foeken and Mwangi, 2000).

However, it is crucial to acknowledge that while urban farming improves food security for many households, the overall impact may vary based on access to land and resources. This raises an essential question about equity in urban agriculture. Our interpretation is that unless policies address disparities in land access, the benefits of urban farming may remain limited to those with sufficient social capital or economic means.

Socio-Economic Benefits

The socio-economic benefits of urban farming extend beyond food security. The findings indicate that the sale of surplus produce in local markets provides a steady income stream for urban farmers, enhancing household resilience and economic stability (Mekonen et al., 2023). This reinforces the argument that urban farming is not just a coping mechanism but a viable livelihood strategy that empowers communities economically.

A key contribution of this analysis highlights how urban farming initiatives foster community empowerment and social cohesion. For example, the formation of community gardens in Kabale and Mbarara creates opportunities for collective decision-making and resource-sharing, particularly for marginalized groups like women and youth. This suggests that urban farming can also act as a social capital-building tool, enabling communities to mobilize resources and advocate for policy changes that support their agricultural activities.

Challenges in Urban Farming

Despite its benefits, urban farming faces significant challenges that must be addressed to realize its full potential. As cities expand, agricultural lands are increasingly being converted to residential or commercial uses. This raises a concern: Will urban farming be sustainable in the face of ongoing urbanization? Existing data (Nuwagira et al., 2023) reveal that in Mbarara and Kabale for example, available land for farming is shrinking, particularly in low-income neighbourhoods. In our view, urban planners must consider the long-term sustainability of urban farming and integrate it into land-use plans.

According to Turyasingura *et al.* (2022), water management is another pressing issue with underdeveloped water infrastructure in many urban centres where farmers often rely on unpredictable rainfall, making them vulnerable to climate variability. Also, Nasinyama *et al.* (2010) highlight the need for innovative solutions, such as rainwater harvesting and irrigation technologies to enhance resilience in urban farming and water resources management. For example, Turyasingura *et al.* (2024) reported that the majority (38% of participants) used mulching to reduce water intrusion into catchments, and this reduced the water contamination in the study area.

The third challenge is a gap in technical knowledge. Many urban farmers lack the skills and knowledge needed to optimize productivity in non-traditional farming environments. For instance, poor women in South Africa have been observed to use diversification strategies and take on extra workloads to improve their skills (Babugura, 2020). Therefore, training programs tailored to urban

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contexts could bridge this gap, but they remain scarce in cities like Mbarara and Kisoro (Oja Da Silva, 2023). This raises a concern about whether current extension services are equipped to support urban farmers. The evidence suggests otherwise, calling for a reform of agricultural extension services to address the unique needs of urban farmers as in line with the study conducted by Turyasingura and Chavula (2022) that recommended a strategic plan for women's engagement in agriculture extension services.

Policy Implications

The findings underscore the importance of integrated policies that prioritize urban farming within broader urban development strategies. Current policy frameworks in Uganda often overlook the potential of urban agriculture, resulting in fragmented support and limited resource access for urban farmers (Omona, 2023). This study indicates that a key policy intervention would be to formally recognize urban farming as an essential element of urban planning for gender integration. This recognition could pave the way for initiatives such as tax incentives for rooftop gardens or land allocations for community-based agriculture. In this regard, Babugura (2019) championed the need for gender integration, mainstreaming and transformation of gender relations and social structures.

Moreover, water management policies must prioritize affordable irrigation solutions and rainwater harvesting systems for urban farmers. This policy shift is essential to enhance water access and ensure the long-term sustainability of urban farming in South Western Uganda's urban centres (Nasinyama *et al.,* 2010). Furthermore, incorporating urban agriculture into climate resilience strategies could help mitigate the impacts of climate change on food security (Katel *et al.,* 2023)

Descriptive statistical analysis revealed key trends in urban population growth, land conversion, food price fluctuations, and income levels among urban farming households in Southwestern Uganda. With a high population density of 991 people/km² (Kishaija et al., 2024), rapid urbanization has led to a decline in agricultural land, limiting food production capacity (Nuwagira et al., 2023). Food price fluctuations remain a challenge, but households practising urban farming experience greater food security and reduced dependency on market prices (Mekonen et al., 2023). Income analysis indicates that urban farmers, particularly those engaged in market-oriented gardening, earn higher and more stable incomes than non-farming households (Leonard et al., 2024). Additionally, 38% of urban farmers adopt mulching to conserve water (Turyasingura, Bekana, et al., 2024), yet challenges like water contamination persist, emphasizing the need for improved irrigation and sustainable water management (Nasinyama et al., 2010). Statistical data highlight the necessity of integrating urban farming into policy frameworks to enhance food security and economic resilience (Omona, 2023).

Finally, these findings highlight the transformative potential of urban farming in addressing food security and socio-economic challenges in South Western Uganda. However, realizing this potential requires a coordinated policy approach that addresses land access, water management, and technical capacity-building (Lubembe *et al.,* 2022). Policymakers should prioritize these areas to create a sustainable and resilient urban food system that benefits all urban residents.

CONCLUSION

In conclusion, this study highlights the pressing challenges of urban food security, particularly in the context of increasing urbanization and its impact on access to nutritious food. The findings reveal that inadequate urban policies often exacerbate these challenges, leading to a reliance on food imports and limited access to local produce. However, the research also uncovers promising examples where effective urban policies have fostered resilience in

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food systems, demonstrating the potential for positive change.

The evidence presented underscores the critical role of community-based initiatives in addressing food security challenges. Initiatives such as urban gardening, local farmers' markets, and food cooperatives not only enhance access to fresh produce but also empower communities to take charge of their food systems. It is evident that engaging local populations in decision-making processes and fostering community resilience is vital for creating sustainable urban environments.

To ensure a comprehensive approach to food security, it is imperative to integrate food systems into urban planning. Policymakers must adopt supportive measures that promote local food production and prioritize community-oriented initiatives. This could include creating urban agricultural zones, providing funding for community gardens, and building partnerships between government, nonprofits, and community groups.

Ultimately, this study calls for a long-term vision that places food security at the forefront of urban policy. By actively involving communities and supporting sustainable practices, we can build resilient food systems that not only address immediate needs but also contribute to the overall well-being of urban populations. It is our hope that these findings will inspire a collaborative effort towards achieving food security, fostering community cohesion, and ensuring a healthier future for our urban areas.

POLICY RECOMMENDATIONS

Based on the findings, it is evident that urban farming holds significant potential to improve food security and socio-economic resilience in South Western Uganda. However, to fully harness this potential, specific policy interventions are required. Below are detailed recommendations for integrating urban farming into urban planning, improving resource management, and promoting technical training programs (Mensah et al., 2024). These recommendations also address the broader implications for urban resilience and sustainability.

- **Establish Urban Agriculture Zones**
  Local governments should designate specific areas within urban centres for urban agriculture. This can include community gardens, rooftop farming zones, and vertical farming structures. These designated zones can be incorporated into city planning policy and zoning regulations to ensure long-term sustainability and prevent unregulated land conversions. Such planning can help overcome the challenge of land scarcity while preserving urban green spaces.

- **Incentivize Private Sector Investment in Urban Agriculture**
  To encourage private sector engagement, governments can offer incentives such as tax breaks, low-interest loans, or grants to businesses and entrepreneurs investing in urban farming infrastructure. For instance, tax incentives could be provided for developing rooftop gardens or greenhouses on commercial properties. This would help mobilize private capital to scale up urban farming efforts and enhance food production in urban centres.

- **Develop Urban Agriculture Policies and Institutional Support**
  Local governments need to formalize urban farming policies and create dedicated urban agriculture units within municipal authorities. These units would be responsible for coordinating urban farming activities, regulating land use for agriculture, and providing technical support to farmers. Establishing clear policies would ensure that urban farming is officially recognized and supported as part of urban development efforts.

- **Invest in Water Management Infrastructure**
  Given the challenges related to water scarcity, policymakers should prioritize investments in

Article DOI : https://doi.org/10.37284/eajab.8.1.2848

urban water management systems. This can include installing rainwater harvesting systems, promoting the use of recycled water for irrigation, and improving access to affordable irrigation technologies. Municipal governments can also introduce subsidies for small-scale irrigation equipment to make these systems more accessible to low-income urban farmers. These measures are essential to enhance the resilience of urban farming to climate variability.

- **Promote Waste Recycling for Urban Farming**
  Waste management policies should support recycling organic waste into compost or bio-fertilizers for urban farming. Such initiatives not only reduce waste disposal challenges but also provide urban farmers with affordable and eco-friendly fertilizers. Municipalities can collaborate with local communities and private waste management companies to establish composting facilities in urban centres.

- **Strengthen Land Tenure Rights for Urban Farmers**
  Policymakers should also review and strengthen land tenure policies to provide security and rights for urban farmers. Clear and secure land tenure would encourage more residents to invest in urban farming, particularly in informal settlements where land rights are often ambiguous. This could be achieved by offering long-term leases on public land designated for community gardens or agricultural projects.

- **Tailor Agricultural Extension Services to Urban Farmers**
  Urban agriculture presents unique challenges, such as soil quality management, crop selection for limited spaces, and pest control in densely populated areas. Agricultural extension services should be adapted to address these specific needs. Policymakers can initiate training programs that focus on modern farming techniques such as hydroponics, aquaponics, and vertical gardening. These programs could be implemented through partnerships between municipal governments, agricultural institutions, and non-governmental organizations (NGOs).

- **Establish Urban Farming Knowledge Centres**
  Municipalities should establish knowledge centres in urban areas to provide technical training and advisory services to farmers. These centres can serve as hubs for disseminating information on best practices, innovative farming technologies, and climate-smart agriculture techniques. By offering regular workshops and demonstrations, these centres would build the technical capacity of urban farmers and foster knowledge-sharing within communities.

- **Leverage Digital Platforms for Knowledge Sharing**
  In an increasingly digital world, it is essential to leverage mobile technology and digital platforms to disseminate farming information. Governments can create mobile apps and online portals that offer practical guidance on urban farming techniques, pest management, and crop selection. Digital platforms can also facilitate virtual training sessions, making technical knowledge more accessible to a broader audience.

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