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Urban agriculture as an evolved sustainable urban livelihood: evidence from Kampala city, Uganda

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Abstract

Background For centuries, urban agriculture has been a vital livelihood strategy of urban households in developing countries. Previous studies looked at urban agriculture at a point in time as an urban livelihood for the urban poor that struggle with eking out a living, without the current dynamism, which attracts the non-poor into the practice. Having become an integral part of the urban economy, the study objective was to use poultry farming, to explore the role of urban agriculture as an evolved and dynamic urban livelihood that attracts the non-poor.

Methods The study was conducted in Kampala, Uganda's capital city. The unit of analysis were urban farming households. Data were collected through four (4) Focus Group Discussions (FGDs), sixteen (16) key informants and twenty (20) In-Depth Interviews (IDIs) using purposive sampling techniques. Data were collected for a period of two (2) months using unstructured research instruments, triangulated and thematically analysed.

Results Our results indicate that; urban agriculture is an evolving urban activity. This evolution and continuities were driven by the merits of urban agriculture (food, jobs and income) to urban dwellers. Urban agriculture also contributed to the economic inclusion of women and the urban poor. There was household resource logic in practicing urban agriculture, especially in the private sector, where jobs were scarce. In view of these innovations, the urban authorities were supporting urban farmers with demonstrations and certified inputs for farmers in Kampala and beyond. To further develop urban agriculture, it is recommended that farmers organize themselves into viable groups to further realize corporate advantages such as better resource access such as affordable financing, access to better inputs and linkages with various institutions and stakeholders in production, value addition, policy and marketing for better returns and sustainable farming practices.

Conclusions These findings if used in perspective by planners and regional managers have utility for the anchoring of urban agriculture in the urbanisation agenda for Uganda and beyond. It is envisaged that, stakeholders can draw useful actions relating to sustainable urban food production (consumer food shed), waste management, incomes, job creation, training, research and innovations in urban areas.

Keywords Urban agriculture, Urban farming, Livelihood, Poverty alleviation

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Introduction

Globally, the number of people living in cities is continuously increasing—with over 55 percent of the world's population living in urban areas in 2018, and the population further projected to have grown by two-thirds by 2050 [1]. In Uganda, the level of urbanization is projected to increase to 50% by 2050, with the current urbanization rate at 5.2 percentage points per annum [2].

The continued rise in urban population, particularly in low- and middle-income countries (LMICs), has been associated with increasing urban poverty, growing food insecurity and malnutrition, especially for children, pregnant and lactating women, and increasing unemployment [3, 4]. One-way urban populations have tried to address food insecurity and malnutrition is through urban farming. In 2013, an estimated 25–30% of urban dwellers worldwide were involved in the Agro-products sector [4], and urban agriculture contributing to provision of food supply to urban dwellers [5, 6]. In 2013, between 100 and 200 million urban farmers worldwide provided city markets with fresh horticultural goods [7, 8]. Urban agriculture is practiced across low-to-high-income classes living in LMICs and has strong participation from women [9]. In addition to helping to improve nutrition and food security [7, 10], urban agriculture has the potential to contribute to the vitality of the local informal market [11, 12] and helps to reduce urban waste through the productive re-use of organic waste as livestock feed and input to vegetable production [13, 14].

The world is not on track to meeting some of the United Nations Sustainable Development Goals (SDG), particularly with regard to the three (3) targets for sustainable agriculture, food security and nutrition [15]. In both rural and urban areas, smallholder agricultural production systems are the main source of food and income for most of the world's poorest people [15, 16]. One of the ways of improving household food security and nutrition in both urban and rural areas is the old agricultural practice of home gardens, including chicken rearing [17, 18].

For centuries, urban agriculture has been a vital livelihood strategy of urban households in developing countries [3, 6, 7, 9, 19]. However, urban decision-makers have only begun to recognize it as a viable livelihood strategy [10]. In some African countries, urban food insecurity has been a challenge for many low-income urban dwellers for decades, especially following the advent of Structural Adjustment Programs (SAPs) that begun in the 1980s [10, 12]. In Uganda, urban agriculture started as a survival strategy among the urban-poor populations especially during the time of economic hardships in the 1970s up till early 1990s [20]. Structural Adjustment Programs consist of an array of monetary, fiscal and social policy measures, mainly espoused by the International

Monetary Fund (IMF) and the World Bank to countries that experience economic crises [21]. As a response to the economic crises exacerbated SAPs in the developing countries and increasing migration to urban areas, urban agriculture began expanding rapidly [9, 21].

In line with the growth of cities in developing countries, urban agriculture with its multiple facets has emerged as an important type of livelihood source [3, 8, 22] as it provides an opportunity for improving food supply and security of urban dwellers [4, 23], which is especially relevant for Low and Middle Income Countries (LMICs) like Uganda. Most urban farmers belong to the economically disadvantaged populations and 65% of the urban farmers are women [4, 23]. Thus, urban farming not only favors social inclusion but also has the potential to contribute to the reduction of gender inequalities. Despite the prospect that urban agriculture could be one method to help address gender inequality, socioeconomic disparities also exist in urban farming. For example, Lee-Smith found that economically advantaged households in Africa were benefiting more from urban agriculture than the majority of poor households [5]. Despite this disparity, urban agriculture is widespread within and around African cities and remains one promising strategy for addressing urban food insecurity especially among the urban poor who experience food insecurity [10].

From the 1950s through the early 1980s, the informal sector, or the exchange of goods that were not taxed or monitored in other ways by government, were globally conceptualized by policy makers as a symbol of decay [24, 25]; the view held was that it represented cultural artifacts inconsistent with city life. Even then, urban agriculture took a diversity of farming systems varied from backyard gardening, plants, poultry and livestock farming [11, 14], to aquaculture [3]. In Sub Saharan Africa (SSA), agriculture on urban open spaces is a market-driven, highly productive and profitable industry [14]. While urban agriculture has multi-functional activities and benefits, such as waste management through recycling, opening up the urban space, and producing fresh and nutritious food in areas with high levels of food insecurity, it is hindered by some challenges such as land tenure insecurity, unplanned settlements and competing non-agricultural demand for land [3]. Despite these constraints, urban farming has remained persistent, resilient and adaptable to the changing environment and is a key driver of sustainable urbanization [11, 13].

Previous studies looked at urban agriculture at a point in time as an urban livelihood for the poor that struggle with eking out a living, without the current dynamism, which attracts the non-poor into the practice [12, 26–28]. Vegetable production and livestock keeping—primarily poultry, dairy farming and rearing of pigs—were

the dominant urban farming practices in Uganda [29]. However, most of the government efforts to improve the economy and food security remained focused on rural than urban agriculture [30, 31]. In addition, while previous studies acknowledged urban farming as a common livelihood in Kampala [12, 26–28], the threat to its sustainability is questioned due to the rapidly growing urban space [22].

It is against this background that we explore the evolution and sustainability of urban agriculture as a livelihood activity in Kampala city. We applied Robert King Merton's Middle-Range Theory which aims at a functional analysis and integration of theoretical and empirical research as a means of unraveling theory and social structure [32, 33]. Merton theorizes middle-range theories as intermediate to general theories of social systems aimed at guiding empirical inquiries in explaining observed uniformity in social behavior, organization and change [32]. The choice of middle range theorizing was on the basis that other than looking at the general-grand theories of social change in a broad context as they apply, we chose to limit our focus on the socio-economic phenomenon of urban agriculture as a sustainable livelihood through its evolution, dynamism and continuities in Kampala city. We use explanatory approaches that fall in the middle range to provide an explanation of urban agriculture in Kampala city. In the process, we examined the micro–macro relationship behind the continuities of the practice through this empirical research. The adopted middle range approach is easily understandable to both academics and practitioners since what is presented emerges from an empirical situation. We believe that this work contributes to further sociological research and urban planning.

Materials and methods

Study design and setting

This was a qualitative study conducted in Kampala which is the capital and largest city in Uganda. The city is divided into five political administrative divisions (Kampala Central, Kawempe—case study site, Makindye, Nakawa, and Rubaga) that are managed by Kampala Capital City Authority—KCCA. Kawempe division is in the Northern part of Kampala, bordering Wakiso district in to the north, west and east, Kampala Central to the South, Nakawa division to the southeast and Rubaga division to the southwest, see Fig. 1 for the location of the study area.

Sampling procedure

The study population (see Table 1) were urban farming households in Kawempe, Kampala city who engaged in and derived their livelihood from urban farming

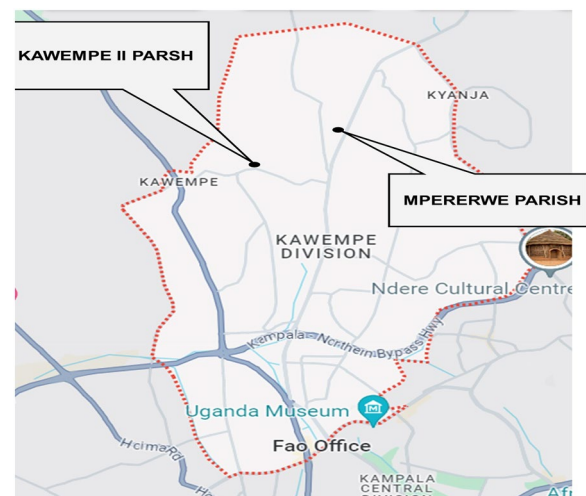


Fig. 1 Study area in Kampala city, Kawempe division

activities. Two parishes were purposively selected for this study (Mpererwe and Kawempe II). Through a participatory process, consultations were made with local leaders on which farmers would best represent the progress and continuity in poultry farming. The participatory process involving local leaders enabled the recruitment of well-known urban agriculture practitioners divided into two groups: (a) those who learned agricultural practices on their own and expanded their enterprise in response to the needs of the local economy (continuity farmers that had evolved from 'safety net' farming practices) and (b) the urban farmers who had learned from the 'evolutionary'¹ farmers, such that they had seen urban agriculture successfully practiced and followed suit (changed practice farmers that into farming for its economic logic-spring-board farming). Names were randomly selected from each of the two groups (a) and (b) as above described. The Key Informants (KI) interviewed to understand farming practices in Kawempe division included Kawempe division Local Council (LC) officials, representatives from civil society organisations² (CSOs), such as those from the Uganda National Farmers' Association (UNFA), as well as officials of local non-governmental organizations (NGOs) and local development initiatives in form of community-based organizations (CBOs). This approach enabled the validation of our study findings. Table 1 shows the sample categories and respective sample sizes. The total number of urban farmers in Kampala city is not

¹ Those farmers that had started small and went on to enhance their endowment through urban farming.

² CSOs are non-state actors that aim at increasing citizen participation.

Table 1 Categories of respondents

Category	Number of respondents		
	Total	Male	Female
Local technical officers	5	4	1
Political leaders–local authorities	4	4	0
Officials of local NGOs and CBOs (<i>these were key informants as leaders and community development stakeholders</i>)	7	3	4
	16	31	25
Mpererwe Parish			
Continuity farmers (evolved—safety net farming)	5	4	1
Changed practice farmers (springboard farming)	5	3	2
Kawempe II Parish	10	7	3
Continuity farmers (evolved)	5	3	2
Changing practice farmers	5	4	1
	10	7	3
Total interviewed	36		

Note: The bold values connote sub-totals in each category. The total number of respondents were 36

known. Kawempe division was selected given the high prevalence of urban agriculture practices.

Data collection and methods

We used a cross-sectional case study design that aimed at obtaining in-depth data on the evolutionary nature of urban farming in Kampala. This approach helped to understand urban agriculture in Kawempe division, specifically, rather than generalizing to all urban areas in Uganda or other African countries. To explore urban agriculture and interrogate it, participatory qualitative methods were used for data collection [34]. This enabled achieve a rich description of the practice while making sense of the shared experiences among urban farmers [35–37]. Data were collected by graduate research assistants that were trained in urban livelihood frameworks and approaches. Research assistants were supervised daily through check-ups during data collection and at the daily submission of field data and reporting.

Measures

We used participatory methods to collect data on a wide range of variables related to urban agriculture. This comprised the use of tools and techniques such as in-depth interview guides for IDIs, FGD guides for FGDs (4 Focus group discussions were conducted each of 10 participants), case study guides for case studies; and livelihood analysis, asset assessment and mapping, respectively. An interview guide was constructed and used to elicit information regarding responses and practices about urban agriculture among urban farmers in the two parishes of Mpererwe and Kawempe II. Secondary sources were analyzed thematically.

Data analysis

Data analysis was iterative, starting with the familiarization of the data. This was done by several reviews and readings of the raw data. The reading and rereading of textual data actively, analytically and critically enabled for patterns and filters for deeper analysis, which generated patterns of meaning (themes) and facilitated the deeper understanding of the evolution of urban agriculture in Kampala city. We then proceeded by an inductive indexing which enabled the coding schema that explored the emerging themes (before firming up the 5 thematic categories as presented in the results). The codes were then grouped through a consultative team process that refined the outcomes for reporting in the results. This approach was within the ‘social constructivist’ perspective widely used in social sciences [38, 39]. The flexibility in thematic analysis allowed focus on the data in numerous ways including (semantic) meanings, assumptions and ideas that lay behind what was explicitly stated [40, 41] and linking to the broader conceptual issues as a method of data analysis, rather than being an approach to conducting qualitative research itself. Selected quotations from interviews and discussions were adopted.

Ethical issues

The study protocol was approved by the Research and Higher Degrees Committee of the Faculty of Social Sciences, Makerere University Kampala. This committee considered all technical and ethical issues of the study. Clearance to conduct this research was also obtained from local leaders at the division and Parish level. An introductory letter issued by Makerere University was presented to local leaders in addition to explaining the

purpose of the study, confidentiality, voluntary participation; anonymity and freedom to withdraw from the study were clearly explained. Verbal informed consent to participate in the study was obtained from all participants. Given the unregulated and informal nature of urban farming in Kampala, insisting on written consent would risk recruitment of inappropriate study participants and a likely withholding of information on account of participants losing trust through wondering why their names were taken. As such we opted to obtain verbal consent [42]. Participants were free to withdraw from the study if they felt uncomfortable. No persons lacking capacity to consent were enrolled in the study. In addition, study participants' identifiers are not presented. The need for confidentiality was emphasized during training of research assistants prior to conducting of the study.

Results

The study presents findings from 36 participants (see Table 1). Study participants included farmers, local government officials (both technical and political), civil society and non-governmental actors. The results are presented along the 4 themes; (i) *Urban agriculture as an evolving urban activity*, (ii) *Women in urban Agriculture*, (iii) *Merits and benefits of urban farming to practitioners* and (iv) *Resource logic: from safety net to Springboard*. These themes are detailed in the subsequent sections. From the derived themes, urban agriculture was a viable urban economic activity that had become increasingly appealing. A practice that has been historically discouraged and prohibited by urban authorities, this study found that poultry and fish farming had attracted growing interest and legitimacy especially that it continues to provide both food and the much-needed economic growth.

Urban agriculture as an evolving urban activity

Urban farmers were initially seen as engaged in informal sector activities. The study found that taking on urban agriculture was based on its contribution to the daily needs in urban living irrespective of its categorization. Our results show that participants chose to practice urban agriculture farming due to its flexibility (on the supply side) in terms of joining the practice and since there were no initial taxes. Urban farmers indicated that fish and poultry products were both in high demand in their neighborhoods and across the city. The demand was because of accessibility to the production points, produce *freshness* and fair pricing due to low transport and handling costs. On the other hand, the informal nature of urban farming in Kampala meant that there was little regulation, certification and authorization by the Ugandan or urban authority. As long as people had the inputs

or supplies, they could start urban agriculture. Another factor in the evolution of urban agriculture was that the practice of urban agriculture needed relatively small capital and sometimes in kind. The critical skill was an entrepreneurial mindset since there was little or no regulation even when there was an urban agriculture ordinance for Kampala city that required a practitioner to have a permit and a license (Livestock and companion Animal Ordinance, Meat ordinance, Milk Ordinance and Fish ordinance 2006) <https://www.kcca.go.ug/uploads/acts/Kcc%20Urban%20Agriculture%20Ordinance,2006.pdf> accessed May 5th 2023 (Kcca, 2023).

All farmers reported having experienced setbacks, including financial hardships, especially a lack of capital finance and inputs, congested premises to handle both human and animal life without posing health hazards, lack of land/space and security of tenure. Furthermore, participants noted a lack of an urban farmer dedicated institution or organization to lobby on their behalf, especially for better access to finance and acquisition of land. In response, urban farmers had engaged social networks to facilitate access to land, funding/credit, farm inputs and information access. There was a collective notion relating to good relations with fellow farmers and neighbours that was a factor in access resources and tools through such relations. We found the presence of farmer self-help groups that had accessed support through various agencies, including government and municipal poverty reduction interventions. This was part of progressive urban social development through social networks. Such cooperative initiatives point towards a need for an urban farmers' cooperative arrangement.

Urban farmers practiced farming largely because of their inspiration and personal incentives while ignoring prohibitive guidelines from local authorities. The local urban authorities acknowledged the increasingly evolutionary nature of urban farming in the city albeit in most cases flouting all the legal requirements set out by Kampala capital city authority.

Urban farmers had taken advantage of vacant land, both private and public to initiate agricultural activities such as fish farming in water swampy and logged area. With such flexible modes of land access, the needed inputs ranged from donations, borrowing, and small-scale financing from self-help and community credit sources. Such modalities were attractive to those trying to eke out a living in a harsh urban economy. To an extent our results dispel the Marxian view that only conceptualized the informal sector (including urban agriculture) as a mere survival strategy arising from the costs of capitalistic society. The Marxian view did not recognize the potential for growth of the informal sector which this study espouses. The initial attraction to urban agriculture

amidst the uncertainty around the practice has hitherto evolved into a viable urban practice with more and more formal practices.

The ready market in the city played a positive role in attracting the non-poor to the practice of urban agriculture. We found that, the already established (non-poor) households³ were involved in urban agriculture by choice. This was based on economic justification and the compelling business case of investing in the practice. Study participants indicated that urban agriculture had evolved over time and is a promising solution to addressing food insecurity and the over dependence on rural areas for food. Urban authorities were cognizant of the evolutionary nature of urban agriculture as well as the role it plays in urbanization. One official at the city division made the following observation regarding urban agriculture:

“Land is diminishing fast, especially in the urban areas, due to the housing sector, better social infrastructure, security and other attractive features. There is an urgent need to maximize the small plots of land in the city to produce food. Urban farming should go a long way in solving the problem of over-dependence on the rural areas for food production... there is need for more urban harvest; growing cities need to grow food.”

The Uganda Food and Nutrition Policy (UFNP) aims at providing adequate food as a human right and treating food as a resource since food affects women, children and men. Urban agriculture seems to be contributing to urban livelihoods by providing creative means of survival for both the urban poor while making economic sense for the non-poor in urban spaces. We found positive perceptions of the practice among local leaders and policy makers. One city official asserted that:

“Urban agriculture can help save on household expenditure, since households are in position to produce some vegetable crops like; cabbages, Sukuma wiki (colewort), poultry products like eggs and meat, tomatoes and onions in their backyards instead of buying them from the market. This is the essence of urban agriculture being sustainable and delivering livelihood...”

The above assertion underlies the progressive nature of urban agriculture, as well as its contribution to urban welfare.

Women in urban agriculture

We understood gender as the socio-cultural construction of roles and relationships between men and women; involving the examination of women's roles, responsibilities, and socio-status in relation to local cultural perceptions of masculinity and femininity that delineate access to opportunities and resources in a particular context. Respondents were asked about their experience with the practice of urban farming. Almost all the interviewed farmers (19/20) were able to generate income for their households. Furthermore, a majority of the female participants reported that they had been able to make money from urban farming. We found that women benefited most from their involvement in urban agriculture as reported by a female participant:

“Urban agriculture can be done close to the home, for starting-up little cash is needed. The practice combines well with the prime responsibilities of women. I can now meet my needs and those of my children without worry... before I started urban farming I would have to depend on handouts from my husband. I have also been able to support my siblings that do not have income.”—Female urban farmer in Mpererwe Parish

Married women had other reasons for engaging in urban agriculture than just improving their families' food supply. Women indicated that while it is culturally acceptable for them to engage in urban farming, it also empowered them in their families and communities. For example, women who engaged in urban agriculture were able to generate income for themselves. A woman narrated how the practice of urban agriculture came in handy when the husband was out of employment:

My husband is a security guard. Since he earns little and sometimes is unable to work, our crops bridge the gap in our food and income. At times he joins me in farming. In such times, production goes high. If we had more land, we could have more produce. After school and during holidays, our children take part in farming. I can say that farming plays a major role in this town. I am sure that I have a job as a farmer! Married woman, Mpererwe Parish

Urban agriculture had strengthened the position of women in diffusing intra-household conflict while also sustainably improving a family's food security. These findings are noteworthy, given that historically more males living in urban areas have been involved in urban agriculture than females. The increased practice and acceptability of urban agriculture by women is a progressive development that sustainably meets both income and nutritional needs. Women noted that, urban

³ The households were studied on the basis of their involvement in urban agriculture and not as a sample from the business sector. These are what the sample described as springboard—changed practices farmers that had capital to invest in what they considered a viable business venture.

agriculture served as an enabler for women to earn and contribute to household incomes, food security, and was a means to mitigate intra-household conflict since it reduced on scarcity and agency in the household. These outcomes from urban agriculture have the potential to lead to more equitable and positive outcomes for women empowerment.

Merits and the contribution of urban agriculture to household welfare

The merits of urban agriculture were the major factor for the continuity of the practice in the city. A farmer in Kawempe said that:

'I found that my family was spending a lot on food in addition to the school fees and medical bills. I decided to start urban farming to earn and save money. As a result, we have been able to save and earn money through the sale of eggs and off layers.'
Female urban farmer, Kawempe

Another urban farmer (a former civil servant) that was retrenched narrated his urban agriculture exploits in the following case study:

'After retrenchment in 1994, I learnt that my neighbours were selling milk from their 3 cows that they reared under zero-grazing. Because my resources were fewer, I ventured into poultry keeping. I used my small savings and retrenchment package to buy 60 chickens. The beginning was not easy. Especially when dealing with local authorities, as well as coming to terms with the high sense of discipline and responsibility as a farmer. To date, I have no regrets; I sell their droppings as manure to some people with fishponds and the high-income earners who are making compounds, -this also earns me more income... I no longer sell the eggs in the neighborhood, but in my own shop, which was a result of my farming activities! At this shop, I receive orders for off layers and broilers especially from the local restaurants. By engaging in urban farming, I am now permanently employed! No one can retrench or retire me from my business. My children are going to school, and they greatly appreciate the practice so much. Our current survival is now courtesy of urban farming.' Married male respondent, Mpererwe

Farmers engaged in poultry farming argued that poultry products were not easily perishable and could be delivered to customers at short notice in response to demand. For example, eggs have a long shelf life (about 2 weeks) even without refrigeration and chicken can be slaughtered and packaged in a few minutes. The supplied eggs were consumed within 3 days of supply. This points

to the earlier finding that pointed to an entrepreneurial mindset as a critical success factor. Therefore, as with any other entrepreneurial activity, the cutting edge is not so much the prevailing circumstances but the nature of decisions, including knowing the market dynamics.

Close to half of the respondents noted that high population density was another factor that was beneficial in terms of better market access through high demand. Therefore, nearness to the market of buyers enabled urban farmers to easily sell their produce. Participants further mentioned that urban farming helped to buffer the effects of disruptions in the supply chain of goods from rural to urban areas (for example, during the rainy season when rural roads become impassable, or during disease outbreaks such as COVID-19 when transportation between urban and rural areas was restricted). These modes of food access were also cashless and largely minimized physical transactions by use of mobile and online applications.

Resource logic: from safety net to springboard

Recycling was mentioned as a key practice in sustainable urban agriculture. For example, fish and poultry farmers noted that any items which would have otherwise easily qualified as garbage, and therefore, 'waste' was jealously guarded and accorded a high 'value' status. For example, chicken droppings were used as food for farmed fish. A fish and poultry farmer noted:

'The bones of fish are used in making poultry feeds which are also sold. This is extra income to me. Because of this additional income, I can now access credit easily at the local micro-finance office since my income is stable, and in some cases I can seek concessions on the payback period.'

The same respondent narrated how he enjoyed the economies of linkage (backward and forward⁴) earnings. Through this, the farmer was able to avoid a miscellany of transport related costs incurred in long distances. Recycling and reuse reduced operational costs while increasing the profit margin by way of additional income. On further probe, the farmer said:

'The next meal is usually from our garbage... as you can see; we really do not have any wastes here'

The above depicts a case of urban farming as a viable urban livelihood. A common thread across our study participants was that urban agriculture had enabled

⁴ Backward linkages of a product are what other products have contributed to make or produce one particular product, forward linkage refers to what other products can be built, produced, or made using that particular product.

households extend their financial and human capital livelihood frontiers. We found that some farmers had converted their cash into assets such as land. This land was used for expansion or other income earning purposes. Such income diversification opportunities have enabled households to have access to more (formal and informal) resources. Some farmers had started restaurants, shops, acquired assets; others had ventured in the transport sector particularly purchase of motorcycle taxis (locally known as *boda-bodas*).

For the non-poor households, the presence, exploits and viability of an urban farmer in a locality, had acted as a queue for action and had acted as motivation for those that were contemplating the practice, including those that had not taken a firm investment decision. Our findings show that to some households, urban agriculture had provided the equivalent of unemployment insurance dating back from the recession and Structural adjustments from the 1980s and 1990s.

We found that the exploits by urban farmers have been appreciated by Kampala Capital City Authority (KCCA) which has supported urban farmers in Kampala and beyond with a demonstration centre in one of its divisions (Kawempe). There are various support interventions and frameworks that are supportive of urban farming as an urban enterprise. The centre provides agro-inputs, provides technical advice as well as extension services. This is a change in stance from the previous restrictive stance. The evident institutional support to urban farming includes access to financing through micro credit under the Parish Development Model (PDM). Through various interventions⁵ urban agriculture is steadily becoming a mainstream urban economic activity. The success factors in urban farming include practicing the right choice of activity by the given farmer, proximity to the market, proper practice of the activity and more importantly security of tenure of premises.

Overall, urban agriculture was taking on an economic appeal beyond merely being a survival strategy. This is the essence of the springboard nature of urban farming which is an added dimension to the traditional survival perspective.

Discussion

The study objective was to explore the role of urban agriculture as an evolved and dynamic urban livelihood that also attracts the non-poor. The study findings indicate that evolved urban farming adds value beyond

commodity trade, and, therefore, is at the heart of job creation and poverty alleviation, which positively affect urban living. Urban farming is part of innovative urban solutions such as climate smart agriculture [43–47] in the face of climate change which is a great risk multiplier often leading to low yields resulting in a great likelihood of ‘climate refugees’ in cities [48–50].

Over time, urban agriculture has evolved from mere provisioning of food through kitchen and backyard gardening for the poor urban households to major sources of fresh food alternatives, income [51] and livelihoods [52, 53]. Urban agriculture is also instrumental in alleviating urban poverty [54] which is an increasing problem in Kampala. To the household and the urban sub-economy, urban agriculture contributes to increased food production, poverty alleviation and social inclusion of the urban poor and women in particular [55, 56].

Unlike traditional extensive agriculture, urban farming depends neither on seasons nor leaving land to rest, thereby defying natural seasons as predictors of supply and their originating price distortions and related losses. This is possible through responsive and innovative practices such as the use of green houses, irrigation, locally made fertilizers through composting [57]. In this way, urban farming fosters maximum yields from compact pieces of land and space by deploying progressive and innovative strategies to optimally use of resources [58]. These urban agriculture dimensions tend to save money, in addition to being addressing the waste and scarcity problems [51].

We posit that urban agriculture does not exist in isolation, but takes place in the context of other urban activities and systems, particularly the growth in the local economy, land use, scarcity, cost of living, ecology that drove resource recycling, waste management and recovery and urban management systems where local leaders were seeing urban agriculture as part of urban living and poverty alleviation. Urban agriculture in some cases had turned waste into productive resources through garbage sorting and re-use as well as earning income from waste [59]. This symbiosis has played a big part in the evolution of urban farming. The availability of jobs and food security are poised to become the major indices for future urban viability. Through the delivery of inputs, production and distribution of poultry produce and marketing; many households derive a livelihood. With the increasing viability of urban agriculture, some households in our study had deepened their capital base as well as their livelihood potential. Urban agriculture was a functional response to household economic growth, poverty alleviation as well as economic empowerment of (especially) women. Taken together, these findings show that urban agriculture is a

⁵ (<https://www.youtube.com/watch?v=rpNtdEal5Fk>. https://www.youtube.com/watch?v=RohUYo3_Brg; <https://cityfarmer.info/uganda-kampala-city-dwellers-to-be-trained-in-urban-farming/>; <https://eastafrika.rikolto.org/en/promoting-urban-farming-kampala>).

sustainable livelihood especially that it plays an important role in enhancing urban food security [54, 60]. This is critical since the costs of supplying and distributing food to urban areas based on rural production continue to increase due to fuel and other associated costs like handling and storage [52, 61]. Urban agriculture had its own value chain that is enabling farmers as to diversify their income sources, increasing household assets as well as their ability to meet the needs of their children especially education and health care. This is the economic equivalent of forward and backward linkages. We posit that as many consumers turn to urban agriculture products, the industry shall inevitably grow further and take on a more and more formal stance. For instance, through paying taxes to local authorities and adhering to standards. Progressively, the formerly informal attributes of urban agriculture associated with poor quality products are likely to increasingly become unsustainable in the face of more formal markets and income opportunities. These findings suggest that economic benefits for the urban agricultural producers may stimulate the development of related micro enterprises such as the production of necessary agricultural inputs and the marketing of outputs, and the activities or services rendered by established or supported enterprises.

To harness the available opportunities in the urban sector, urban farmers ought to organize themselves into collective units and take advantage of certain economies of scale in production and marketing. These farmers' organisations can bring together independent farmers that share certain interests or farming systems to assist them in gaining access to possibilities and overcoming barriers through lobbying, obtaining information, reforming laws and regulations to deal with the negative effects associated with informal urban farming. If food is produced nearby—where people live, most of the proceeds from consumer sales go to the farmer and not transporters, wholesalers and logistical costs. This could be the first step towards hyper-local food production. Unlike where agro-products are sources far from the market, urban farming products are likely to be better quality since they are not selected for their capacity to withstand the arduous journey of transport, storage and supply chain troubles. This means that products can be picked when they are at their best and most nutritious and not before.

In Kampala, urban agriculture has been transformed into a viable economic enterprise for urban dwellers who have adopted it as an alternative source of food, income and indeed jobs. Urban farming has broken into the urban food question and breaking out with structural change, addresses the question of sustainability in the

face of pervasive climate change and rural agricultural disruptions.

Study limitations

The study used a small sample and was qualitative which poses limitations in generalization of the study findings. In addition, data from one city of Kampala city do not present a national picture across Uganda. The purpose of this study was thus, not to test hypotheses but rather to understand the context and effect of urban farming in Kampala city.

Conclusion and recommendations

The urban and peri-urban environments and context are conducive for intensive production that takes advantage of the relatively high incomes in urban areas, strategic location and the resulting effective demand. Urban and peri-urban agriculture clearly are arguably undergoing deep transformation; so should the information and outlet channels about urban agriculture.

We also noted that relations and being networked are key within the sector. Deep bonds and networks are central in production and market access in various ways relating to motivation, diligence and creativity. The role of relational capital in space management cannot be overemphasized.

For sustainable urban agriculture, there is need for resources and inputs to be cheap and available. Urban farmers presented resilience in the face of severe barriers to production and market access. The study shows that the practices of urban agriculture had adapted through the tolerance of uncertainty. It is this niche in urban production multi-functionality, food chain management and the effective use of resources and reuse that had led to the evolutionary practices of urban agriculture in Kampala city.

Therefore, urban farming and agribusiness are not an issue of 'either' 'or'. It should be a matter of making the right decisions for increased productivity, enhanced resilience and adaptation and mitigation through recycled urban waste that are key factors in urban sustainability. Although urban agriculture needs to be perceived in what can work across many urban landscapes, adopting urban agriculture, as a sustainable livelihood does not mean practicing it everywhere. The insights gained through this study can be used holistically and in perspective to design appropriate linkages to anchor urban agriculture to progressive urbanization through appropriate and intermediate technology. There is a need for impact evaluation to further augment the role of urban agriculture on various urban welfare and livelihood dimensions.

This study contributes to applied sociology having studied the essence of reality by attempting to grasp what is around urban living through empirical research. By middle range theorizing, we have attempted to present empirical facts and social realities based on the evidence adduced by our results.

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Author contributions

JK—the first author conceptualized the study and carried out data collection. Each author made a worthy contribution to the manuscript preparation. This manuscript was read and approved by all authors.

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Availability of data and materials

The data used to support the findings of this study are included within the article.

Declarations

Ethics approval and consent to participate

Verbal informed consent to participate in the study was obtained from all participants.

Consent for publication

Participants gave consent to publish findings.

Competing interests

The authors have no conflicts of interest to disclose.

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