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Review Article

Effects of Urban Agriculture on the Socio-Economic Status of Farmers in Cities of Sub-Sahara Africa. A Case of Zambia and Nigeria: A Review

Ninsheka Leonard^{1*}, Ssemakula Edward¹, Tiyo Christopher¹, Kalibwani Rebecca¹ and Kityo Ronald²

¹Department of Agriculture, Bishop Stuart University, Mbarara, Uganda

²Department of Agriculture, Ndejje University, Kampala, Uganda

*Corresponding Author's E-mail: ninsheleo@gmail.com

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Abstract

This paper reviews the current literature concerning the effect of urban agriculture on the socioeconomic status of urban farmers in Sub-Sahara African cities. The main objective of this review is to; examine the impacts of urban agriculture on the socio-economic status of urban farmers in Sub-Sahara African cities concentrating on Zambia and Nigeria. Specifically, the paper reviews the impact of urban agriculture on the income of Urban farmers in Zambia, and it also looks at the benefits and challenges affecting urban Agriculture development in Nigeria as part of sub-Saharan African countries. This paper reviews different articles and papers on urban farming in Sub-Sahara Africa and globally. The review posits that there is scanty information on how urban agriculture affects farmers' socio-economic status in sub-Saharan Africa. How farmers derive their social and economic status by engaging in urban agriculture, the types and motivations of farmers are not clear. The review suggests that understanding the factors that are crucial for income and related benefits in urban agriculture is essential to developing the right technologies and policies.

Keywords: Urban agriculture, Socio-economic status, Cities, Uganda, Farmers

INTRODUCTION

World over Cities invests in Urban Agriculture (UA) initiatives (**van Tuijl et al., 2018**). This is backed by a variety of rationales and policies. On both the global and domestic fronts, UA is taking on many forms and is being driven by several motivations which include farmers' interests, marketing systems, extension services, and policies on urban farming (**Kirkpatrick et al., 2017**). In the early years of urban farming, the practice was limited to simple agricultural practices meant to produce food and income to supplement the needs of the poor (**Nicholls et al., 2020**). As the practice increased in size and needs, the forms of UA increased and the motivations increased (**Stewart et al., 2013**). The term 'urban agriculture' is spreading across developed and developing countries worldwide. In developing

countries, UA is particularly used to feed the rapidly growing population, while in developed countries; UA usually is associated with lifestyle, health, community development, and innovation. According to Thebo, et al., "urban agriculture" means the practice of growing crops, aromatic plants, herbs, spices, and ornamentals; and the rearing of fish, poultry, and livestock for food, income, environment management, and medicine in and around the cities, towns and urban environments; and includes the processing and marketing of such products.

UA is now being 'formalized' due to its significant contributions to urban food systems, ecosystems, and the economy (**Kangogo et al., 2020**). Because of this formalization, some countries in Sub-Sahara Africa (SSA) now have 'Urban Agriculture Directorates' as

part of their government departments. UA in SSA encompasses a complex and diverse mix of production and marketing activities. The most common systems are

- Backyard gardening (mostly subsistence).
- Open space crop cultivation for irrigated vegetables, flowers and ornamentals, seedlings, and rain fed cereals (mostly market oriented).
- The rearing of livestock, small ruminants, aquaculture, and poultry (both subsistence and market oriented) (Drechsel et al., 2006).

LITERATURE REVIEW

Urban production systems are usually very intensive and small-scale due to the lack of farming space caused by competition from other sectors, especially housing. Production is supported by a marketing network and to a lesser extent processing systems. Regardless of the aforementioned developments in urban agriculture, however, there is still scanty information relating urban agriculture to the socio-economic status of urban farmers in sub-Saharan Africa. How farmers derive their social and economic status by engaging in urban agriculture, the types and motivations of farmers are not clear. The review suggests that understanding the factors that are crucial for income and ownership of property in urban agriculture is essential to developing the right technologies and policies. The review specifically, looks at;

- The impact of urban agriculture on the income of urban farmers;
- The challenges and opportunities affecting urban agriculture development in sub-Saharan Africa.

Methodology

Secondary data was collected through the review of relevant published academic literature such as journal articles, books, periodicals and unpublished literature (grey literature). The information considered in this review rotates on establishing the relation between

urban agriculture and income and the opportunities and challenges facing urban agriculture.

RESULTS

Impact of urban agriculture on the income of urban farmers

According to Mupeta, Kuntashula and Kalinda in their study about the impact of urban agriculture on household income in Zambia, using the Propensity Score Matching (PSM) method on urban agriculture and non-urban agriculture practicing households. Information was from the analysis of results that were based on the 2007/2008 urban consumption/expenditure secondary data collected in Kitwe and Lusaka districts, with a total sample size of 2,682 urban households, revealed that the results from the three matching algorithms as shown in Table 1. The nearest neighbour matching methods showed that urban agriculture had a positive and significant impact on household income. Engaging in urban agriculture increased household income by 19.1%. Likewise, radius matching methods indicated that urban agriculture had a positive and significant impact on household income. Practicing in urban agriculture increased household income by 13.7%. Kernel matching methods further confirmed the impact of urban agriculture on household income. According to the kernel matching method, urban agriculture increased household income by 14.5%. All three matching methods used were consistent with the estimated impact of urban agriculture on household income with a very narrow variation in the estimates. It can be observed and concluded from the results that controlling for observable characteristics, participation in urban agriculture would increase household income in the ranges of 13.7% to 19.1%. These results were significant at a 95% confidence level. These results are consistent with other studies such as Salcu and Attah and Zezza and Tasciotti, who also concluded that urban agriculture is positively related to household income.

Table 1. Expected log of total household income: Treatment effects of urban agriculture in Kitwe and Lusaka districts.

| Variable | Matching method | Sample | AU Participants | AU-Non Participants | ATT | S.E | t-State |
|--------------|------------------|---------|-----------------|---------------------|--------|--------|---------|
| Log of total | Nearest Neighbor | Matched | 9.1382 | 8.9472 | 0.191 | 0.05 | 3.82 |
| Household | Radius | Matched | 9.1137 | 8.9764 | 0.1373 | 0.0426 | 3.22 |
| Income | Kernel | Matched | 9.118 | 8.973 | 0.1445 | 0.0431 | 3.35 |

Source: Mupeta, Kuntashula and Kalinda

Benefits and challenges affecting urban Agriculture development

Benefits of UA development: The opportunities of UA are backed by the potential benefits of engaging in it which include:

Social development (Inclusive city): UA may contribute to social development in at least three (related) ways.

Firstly, UA is an important element of food security strategies. In developing countries, cities use food security strategies to 'feed citizens', and fight chronic hunger (Morgan et al., 2009). Urban agriculture complements rural agriculture in enhancing the efficiency of the national food system in providing products whose timely demand rural based agriculture cannot supply easily (perishables).

Food security in UA can also; contribute to the prevention of micronutrient deficiencies; provide non-market access to food for poor consumers; enhances food security during times of crisis and severe scarcity; enhances the freshness of perishable foods reaching urban consumers *i.e.*, increase the availability of fresh, perishable food. Secondly, UA can be used for community development. This refers particularly to urban gardening as an activity to increase social cohesion between different groups in society, to provide work and training experience for unemployed workers, and as a tool for crime prevention. Thirdly, UA is used in cities for educational purposes. Through workshops, courses, and tours, urban farmers increase the awareness among citizens about the origin and production of food (e.g. 'milk comes from a cow and not from the supermarket').

Environmental development: UA has various benefits for environmental development, such as increasing biodiversity, and the reduction of pollution. Cities use UA also for climate change mitigation, and adaptation. Urban greening: Green roofs are used for storm water management and energy savings, as well as for aesthetic benefits. Green roofs absorb storm water and release it back into the atmosphere through evaporation and plant transpiration while reducing urban temperatures by limiting the amount of heat retaining structures hence reducing the heat island effect. The vegetation on the roofs also absorbs a great deal of the pollutants in the water before it is released into the atmosphere. Rooftop gardens retain up to 100% of precipitation, which reduces storm water runoff and minimizes irrigation requirements (Mupeta et al., 2020). Rooftop gardens also reduce glare, noise, and wind, absorb CO₂ emissions, increase biodiversity, and can use sustainable technologies. Further, urban agriculture can significantly reduce urban waste. Tones of biodegradable organic wastes and wastewater produced in cities, municipalities and town councils are capable of being turned into productive resources such as compost or animal feed and energy sources like Biogas and Briquettes. Waste water (grey water) can be reused to irrigate crops thereby conserving water. Utilization of vegetative wastes as compost by urban farms and gardens reduces waste volume directed towards landfills by as much as 40%. UA, therefore, plays an important role in balancing urban ecosystems in the urban environmental management system (Salau et al., 2012).

Recreation: According to Shumsky, edible plants engage people as they grow, harvest, and eat them. Whether, in a private garden or a public space, people become more involved and connected to the land and the food that they grow. According to Becker, the fruit tree project brings together a range of community members to harvest and share the fruit (Thebo et al., 2014).

Economic development: UA offers economic benefits for cities in various ways. Firstly, it can be regarded as a new way of generating income. Urban agriculture has economic benefits for everyone from the home gardener or urban farmer to the city government. Home

and community gardens can reduce the amount of money spent on food. Urban agriculture is highly compatible with other jobs and facilitates multiple income sources, hence enhancing resilience. UA products particularly from agro enterprises serve as a source of income for the urban poor in addition to addressing their food needs. Income can be got through selling fresh food in the market in form of vegetables, fruits, milk, meat and eggs. Food production, processing and marketing also contribute to generating income and employment for many poor urban households. Secondly, UA is important for innovation, research, and knowledge development. Thirdly, UA may offer the potential for recreational, tourist and marketing purposes. Further, many urban farms are open to the public and organize tours, and as such, they could be compared to other tourist attractions.

DISCUSSION

Challenges of urban agriculture development

One of the challenges of UA in cities is climate risk. Weather changes are becoming unpredictable characterized by long drought spells and violent storms which pose great challenges to UA. Flooding is a critical risk in Kampala. Much of the city is located in the valleys between steeply sloping hills. While the extent of UA losses due to flooding has not been estimated, vegetable plots that are located close to informal settlements in wetland areas are regularly washed away after downpours. Of course, flooding presents compound risks that extend well beyond the loss of vegetable crops to include damage to housing in informal settlements, more waterborne disease outbreaks, and loss of other livelihood resources that further erodes household food security. Also, it can be argued that UA is not as healthy and fresh as expected (Zezza et al., 2010). Vaneker even noted that due to (air) pollution in cities, there are health risks concerning 'urban vegetables' that may contain high concentrations of heavy metals. It is a widely known fact that cocoyam grown in wetlands in urban areas is heavily polluted by heavy metals, including copper. Similarly, it has been argued by Fussy, that new soilless growing technologies lead to 'artificial food' that lacks sufficient natural nutrients.

Furthermore, UA may lead to conflicts with other urban functions, such as living and working. There can be a lack of sufficient and suitable land for agricultural activities in cities, and whenever space is found for it, UA may cause negative externalities, such as air pollution (e.g. odour from livestock), or overcharging the city's energy grid. Environmentalists may also protest against farming in cities, particularly referring to (animal) husbandry. For instance, in Rotterdam, environmentalists have (unsuccessfully) protested against a pilot project dealing with pig farming in rooftop gardens which is said to go at the cost of the well-being of pigs. Moreover, and related to the previous point, UA may be hindered by legal constraints and governance conflicts. Zoning policies and certification have an impact on all aspects of UA,

including sitting, production, infrastructure, marketing, and access to inputs. In general, certification is seen as an important constraint for the social dimension of UA rather than producing for the market. Finally, UA requires large investments to cover high operational costs, including the costs of the infrastructure, energy, and management. Therefore, it may be hard for beginner urban farmers to generate sufficient income. This is backed by the results from the survey by Salau and Attah, on Socio-Economic Analysis of Urban Agriculture in Nasarawa State-Nigeria, using 90

respondents. The study found that among the constraints that urban farmers face poor extension service areas the dominant at a mean score=2.07, this is followed by low capital at a mean score=2.2, followed by high costs of labour at mean score=2.001, inadequate inputs supply at mean score 1.93, followed by inadequate land at mean score=1.93 also, followed the theft of products by mean score=1.91 and lastly encroachment of farms by mean score 1.78 which further presented in Table 2 below.

Table 2. Mean scores of Likert rating of factors affecting urban agriculture from Nasarawa state, Nigeria.

| Constraints | Mean scores | Ranking |
|--|-------------|-----------------|
| Low capital | 2.02* | 2 nd |
| Inadequate land | 1.93 | 4 th |
| Poor extension service | 2.07* | 1 st |
| Encroachment of farms | 1.78 | 7 th |
| Theft of products | 1.91 | 6 th |
| High cost of labour | 2.00*1 | 3 rd |
| Inadequate inputs supply | 1.93 | 4 th |
| *=Serious constraints. | | |
| Source: Field Survey by Salau and Attah | | |

CONCLUSION

This paper reviewed information on the contribution of urban agriculture to the socio-economic status of urban farmers. The review has proved that urban agriculture can be lucrative and supplemental household income. This is backed by many opportunities and benefits one enjoys when engaging in urban agriculture notably food security, healthy eating with fresh food, and recycling of waste products among others. Notwithstanding the challenges and constraints which include inadequate inputs, theft of products, high cost of labour and lack of guidance from trained professionals among others. Therefore, there is need to consider urban agriculture by city planners when formulating city regulations.

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