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Chapter

Urban Horticulture in Sub-Saharan Africa

Ifeoluwapo Amao

Abstract

Horticultural crops refer to fruits, vegetables, spices, and ornamental and medicinal plants which are rich sources of vitamins, minerals, and phytochemicals. Rapid urbanization and migration of rural populace to the more industrialized city center has led to poverty, malnutrition, low and insecure incomes, ill-health and other livelihood problems. These problems are mostly seen among the people residing in urban areas who have migrated from rural areas. Urban horticulture ensures food and nutrition security, healthy environment and sustainable livelihoods, employment generation, among others. As such, this chapter carried out an empirical review of the state of urban horticulture in cities across sub-Sahara Africa. This is to enumerate ways whereby the benefits of urban horticulture can be specified in the region. It concluded that governments in the different countries need the political will to actualize identified benefits of urban horticulture. The chapter then recommends sensitization of the pertinent stakeholders in countries across sub-Saharan Africa on the benefits of urban horticulture. Such stakeholders include politicians, policy makers and urban households. This is in order to integrate the concept into urban land use planning while carefully considering sustainability of the environment.

Keywords: fruits and vegetables, sustainable city, food security, malnutrition, livelihood

1. Introduction

Low levels of poverty due to failure of growth in Gross Domestic Product (GDP) per capita has been observed in sub-Saharan Africa where the average real per capita income in year 2010 was 688 USD as compared to 1717 USD in other developing countries of the world [1]. Agriculture is a major contributor to GDP in Africa (up to 32%). Nevertheless, the sector is characterized by low productivity. It is important to increase agricultural productivity in Africa to ensure poverty reduction [1]. In addition to poverty, inhabitants of most cities in sub-Saharan Africa are experiencing micronutrient deficiencies. For instance, over 200 million and 1.6 billion suffer from Vitamin A and iron deficiencies respectively [2, 3]. In the same vein, it is expected that the populations in urban cities across sub-Sahara Africa will increase rapidly due to rural–urban migration and natural population increase [4]. A projection of 20.2% increase is expected by 2050 [5] which will place more burdens on the currently available food, fruits and vegetables in cities across the region. Other challenges posed by the rapid growth in these urban areas include food insecurity and unemployment [6]. Urban agriculture/horticulture is a veritable solution to these identified problems in the urban areas of sub-Sahara Africa.

There are various definitions of the term "urban"—an urban area can be determined based on a number of factors; for instance, population size, density, administrative function and other indicators such as infrastructure, facilities, employment [7].

Urbanization is the increase in number of people living in the cities caused by migration, commercialization, industrial growth and social factors (presence of educational facilities, better standard of living) [8].

Urban Agriculture (UA) can be defined as "an industry within (intra-urban) or on the fringe (peri-urban) of a town, city or metropolis which grows, raises, processes and distributes a diversity of food and nonfood products using largely human and material resources, products and services found in and around that urban area and in turn supplying human and material resources, products and services largely to that urban area" [9].

Fruits and vegetables form an essential part of horticultural crops rich in fiber, minerals and bioactive compounds. Consumption of fruits and vegetables is necessary to ensure healthy diets for balanced nutrition. They are consumed alongside staple foods and prevent diseases as a result of deficiencies across the population. Diets of most of urban dwellers are deficient in micronutrients such as vitamin A, iron, iodine, zinc [10].

The most widespread form of urban agriculture involves horticultural crops [11]. From their own viewpoint, Dimas et al. [12] defined urban agriculture as the production of fruits, vegetables and food within the urban environment for household consumption and sale. Considering the aforementioned, it can be inferred that urban horticulture is urban agriculture which has to do with production of horticultural crops—fruits, vegetables, spices, and ornamental and other medicinal crops. Thus, in this chapter, urban horticulture is urban farming with horticultural crops in focus.

2. Urbanization and urban agriculture/horticulture

Reasons for urbanization include employment opportunities (access to better paid jobs) and modernization. However, ills of urbanization have been identified to include crime, global warming, unhealthy environment, experienced in slums due to overcrowding and unemployment [8]. Population in some urban areas of West Africa has increased from 4% in 1920 to 45% in 2011. Urbanization has resulted in increased urban food demand challenging food production, rural–urban linkages, transport and traditional market chains [13]. A significant percentage (60–100%) of the perishable vegetables consumed within some African cities such as Ghana, Dakar, Bamako and Dar es Salaam, are produced through urban vegetable farming. This indicates a high contribution of urban vegetable farming to balanced diet of these urban dwellers [14].

Urban agriculture can be sustained with adequate development of urban areas. International policy makers have identified the role of urban and peri-urban fruit and vegetables production in enhancing vitamin and micronutrient supply for households in the urban areas especially the poor ones [15].

Urban agriculture can increase employment and income which brings about the ability to purchase food and increase the diet of households thereby ensuring food security. For example, in Ghana during the post-independent economic crises, the government supported urban agriculture as a means of meeting the population's food demand by launching the "Operation Feed Yourself" programme in which the urban population were encouraged to practice aquaculture, plant everywhere and anywhere in the cities [16]. There were 800–1000 farmers in Accra (Ashiaman-Tema area) with 60% of them producing exotic vegetables while the remaining

40% produced indigenous vegetables. They produced exotic crops such as lettuce, cabbage, cauliflower, spring onions and indigenous crops such as okra, *Corchorus* spp., aubergine, hot pepper and tomato. These crops were grown within the city on plot size ranging between 0.01–0.02 ha per farmer [13].

Moreover, urban agriculture is an important food security strategy for urban households [9, 17, 18] since it improves access to a ready fresh crops [19] rich in essential micronutrients in poor household diets [20, 21].

Urban horticulture provides highly nutritious and healthy plant-based foods; it also serves as a means of securing the livelihood of urban population. For instance, more than 70% urban rowers in Tamale, Ghana are involved in vegetable production for home consumption and the market [22].

It is important to include urban horticulture in urban land use planning and policy making because if well managed, it will serve as an important tool for poverty reduction, environmental management and economic development in most developing countries. Several stakeholders are required to come together to achieve the benefits of urban horticulture including politicians, legislators, urban planners, land owners, entrepreneurs, producers and urban dwellers. These stakeholders act at the local, national and international levels to transform the concept to operational standards and actions which will enable it to contribute to food security, food safety and livelihoods.

Participating in urban horticulture improves climatic factors, e.g., biodiversity, air quality, water management. However, cultivation close to major roads and railways as well as abandoned sites should be avoided as they pose threats of health hazards to the consumers through contamination of the produce [23, 24]. Thus, the health implication of potential hazards obtained from producing fruits and vegetables in urban areas should not be neglected.

Moreover, if urban horticulture is given more technical and institutional support, the sector may assist expanding African cities in achieving zero hunger [25].

Integrating urban agriculture into land use planning gives rise to urban greening, open green spaces, urban habitat diversity as well as reduction in noise and pollution. Economically, it will lead to food security and community revitalization through participation in community gardening. Income generation and employment creation can also be achieved through urban agriculture. In order to have a sustainable city, basic amenities such as water and waste have to be produced and managed in line with the principles of sustainable management, that is, economic, environmentally friendly and equitable [26].

3. Empirical reviews on urban agriculture/horticulture

An exploratory cross-sectional survey was carried out in Eldoret, Kenya to examine the effect of socio-economic characteristics of low-income horticultural food producers and sellers on their livelihoods and household food security. The results showed that male respondents were more involved in production while females were more involved in selling. Sellers were more food secure than producers while producers felt safer to make available quality food for their households when they experience tough food situations. Producers and sellers affect each other's livelihoods while the success of one group leads to that of the other. It is imperative to increase farming in the city in order to meet the employment and food needs of the urban population especially the poor [15].

Mkwambisi et al. [27] in their study, empirically examined the role of urban agriculture in urban households with focus on two main cities in Malawi- Lilongwe and Blantyre. The study observed that on the average, households surveyed could

support themselves on the food they produced on the urban agriculture plots which were either within their living houses or on plots around the urban area. The study also revealed that more educated, wealthier and male-headed households had significantly more harvest than poorer, less educated and female-headed households. However, the female-headed households obtained more income from urban agriculture than their male counterparts. However, they are more likely to sell horticultural crops than the female-headed households. Vegetable production was the most lucrative sector for the sampled urban households; other sectors involved were arable maize, livestock and poultry production. The study further revealed that urban agriculture is the second most important source of income for the sampled households. Households produced horticultural crops due to their low demands of expensive fertilizer and short production cycle. In addition, the study observed the need for promoting policy that could support the production of vegetables in urban farms, as well as encourage contract farming so as to link urban farmers to high value markets to provide them with high income and also a means of employment and wealth creation. It concluded that urban agriculture should be recognized on the political agenda in order to realize its immense benefits. This is because those involved in urban agriculture were important stakeholders in a bid to tackling the issue of food insecurity and poverty faced in most sub-Saharan African cities. Urban sustainability could be achieved if municipal solid waste and waste water are used to produce food and livestock.

In eleven Southern African cities, Frayne et al. [28] performed a study to confirm the potential benefits of urban agriculture in urban development and poverty alleviation under the present practice and regulations. Secondary data collected by the African Food Security Urban Network (AFSUN) between year 2008 and 2009 from 6453 households residing in the selected Southern African cities was used for the study. The results revealed that no significant differences existed between households who were engaged in urban agriculture as a food source and those who did not. However, there were exceptions in Maseru (Lesotho) where households involved in urban agriculture as a food source had significantly better access to food and dietary diversity than other households in the city. The same trend was observed in Lusaka (Zambia), Cape town and Johannesburg (South Africa). Also, the practice of urban agriculture in the study areas is not an effective strategy for food security despite variations observed. Urban agriculture is correlated with education, wealth and landholding of the household head (as reported in [27]). Furthermore, findings revealed that urban agriculture plays limited roles in poverty alleviation. The rate of household engagement is determined by political and historical circumstances. No significant relationship was observed with urban agriculture and food security in most cities. It was concluded that significant investment and support in terms of inputs, extension services, credit access, production and marketing infrastructure are all required to be able to realize the potential benefits of urban agriculture for food security and poverty alleviation.

Moustier [29] examined the role of urban horticulture in contributing to the supply of vegetables in African and Asian cities. Findings revealed that to provide perishable food items such as fruits (plantain/banana) and fresh perishable vegetables in the study locations, urban agriculture is important. Some examples of fresh perishable vegetables produced in African and Asian cities are amaranth, cabbage, lettuce, etc. The study also showed that producing close to the point of consumption has a dual advantage of reducing physical transport cost as well as information and transaction cost related to marketing. This is beneficial as it guarantees food safety. In addition, the study noted that for public support into urban agriculture, the government should include financial support, integrate urban agriculture/horticulture into urban planning, encourage innovative marketing and quality labeling

as well as ensure research and extension to improve profit and ensure sustainability of intensive commercial vegetable and animal systems.

The contribution of urban agriculture to socioeconomic development of urban dwellers was assessed in three urban centers of Nasarawa state [30]. The socioeconomic characteristics of urban farmers sampled showed that 60% were aged 41–60 years, 55.56% were female, and 90% were married. Moreover, most of them (77.78%) produced vegetables, maize (66.67%), ornamental crops (61.11%). A greater proportion of the urban farmers derived additional income from their farming activities while 55.56% opined provision of household feeding as a benefit of urban farming. Constraints faced by this group of farmers were poor extension service, low capital, high cost of labor, inadequate input supply and land, theft of produce and products as well as encroachment of farms. The study then concluded that urban agriculture should be considered in urban land use planning since it is a source of urban income, employment and food systems. Also, urban agriculture should be integrated into national agricultural research in order to achieve intensive and sustainable cropping systems.

A study carried out by Ibok et al. [31] examined the productivity of urban food crop farming households and its effect on their food security status. The study collected data from three urban centers in Cross River state, Nigeria. There were more food insecure households (53.5%) than food secure ones (46.5%) involved in the study. The productivity of urban farming households positively and significantly affected the food security status of households.

Adedayo and Tunde [32] studied the motivation for women involvement in urban agriculture in Kwara state Nigeria. Women were attracted to this activity considering food security, access to land and income supplement. As such, income realized from urban farming could then be used to meet other basic needs. The study noted that owing to its potentials, urban agriculture should be encouraged in both small and big towns in Nigeria and other developing countries.

Obuobie and Sarpong [33] conducted an informal study on irrigated vegetable production in urban and peri-urban areas of Cape coast and Takoradi, Ghana. Exotic vegetables found in the area included spring onion, cabbage, carrot, lettuce and cucumber. Insignificant level of irrigated vegetable production was observed in Cape coast due to the saline nature of soil in the area, scarcity of fresh water and unsuitable topography. On the other hand, considerable quantities of vegetables were produced in different production sites across Takoradi. The study found that about 25 farmers were involved in the activity, all of whom were males and aged 28–45 years with about 5 years experience in production of vegetables such as cabbage, carrot, spring onions, cauliflower, lettuce and green pepper. Other vegetables they produced were tomatoes, okra, long bean and black bean. These crops were being produced utilizing mostly family labor on an average farm size of 0.12 hectares. Farmers experienced low pricing for their produce as a result of glut from the sales of similar products that were brought in from outside the urban and peri-urban area. There was also lack of storage system in the peak season which led to perishability of the produce. Despite this, some of the farmers attested that they earned a gross margin of about 2 million Ghana cedis. The study concluded that if the problems mitigating irrigated vegetable production in Cape coast is addressed, the youth will be encouraged to earn a living through this venture, i.e., irrigated vegetable production.

Furthermore, Tornyie [26] examined critical approaches needed to incorporate urban agriculture into urban planning and management in two urban cities—Accra and Kumasi in Ghana. The study revealed that the farmers involved in urban agriculture produced crops such as spring onion, lettuce, cabbage, green pepper, okra, cauliflower. The activity was male-dominated in both study locations; farmers were

literate and some employed other people to assist in their production activities. The main reasons they were engaged in the activity was availability of water and profit being realized. Farmers experienced constraints such as inadequate access to credit as well as safe and cheap irrigation facilities, limited access to land, threat from pest and diseases, and marketing of produce. Moreover, findings showed that no comprehensive plan existed for urban agriculture; the issue was partially mentioned in the bye law of Accra Metro Assembly of 1995. This supported backyard farming and was promulgated with the major aim of maintaining sanitary conditions in the metro assembly and not to promote urban agriculture. The study recommended that good physical planning should not regard agricultural lands as residential lands or those for commercial uses. Also, integrating urban agriculture into city development would require including urban and peri-urban agriculture in zoning plans, construction of urban territorial way, among others. In addition, policy makers should ensure that the needs and benefits of urban agriculture (land tenure, drainage and water availability) should be considered in physical planning.

In addition, the socio-spatial dynamics of household food and nutrition security was assessed by examining vegetable production, consumption and its contribution to diets of households [34]. This was carried out to assess the role of urban and peri-urban agriculture in Tamale, Ghana. The results revealed that okra, pepper and roselle were the most commonly produced vegetables in the study area cultivated mainly for household consumption. A greater proportion of the households produced staple crops compared to vegetables. The results also showed a low consumption of dark green leafy vegetables and limited diversity of vegetables, especially vitamin A rich vegetables and tubers. Urban households had highest dietary diversity and dark green leafy vegetable consumption. This finding could be due to their accessibility to fruit and vegetable markets as well as other food suppliers. However, limited diversity of vegetables consumed was noted in the rural areas.

Lastly, Mugalavai et al. [15] concluded that in Eldoret, Kenya, increasing farming in cities was important to meet employment and food needs, especially for the poor urban population. From the findings of Mkwambisi et al. [27], they opined that urban agriculture should be recognized on the political agenda. This was because it was the second most important source of income for households in Blantyre and Lilongwe, Malawi. The need for investment and support for urban agriculture in terms of extension services, credit access, and so on was observed [28]. The study also observed the need to integrate urban agriculture into urban land use planning [26, 30].

4. Conclusions

The identified benefits of urban horticulture include food security, employment and income generation for producing households as well as individuals employed to work on the urban farms. It also reduces the cost of transportation and easy access of healthy food to the teeming urban population.

In order to realize the benefits of urban horticulture in the sub-Saharan African region, it is imperative that governments in the different countries have the political will to actualize the identified benefits. This can be achieved by sensitizing them on the benefits of urban horticulture and integrating this concept into urban land use planning while ensuring environmental sustainability.

Conflict of interest

The author declares no conflict of interest.

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