

## **Urban Agriculture: the Implications of the Untapped Potentials for Lagos State**

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### **Abstract**

Promoting farming in poor urban neighborhoods has been found to have a positive impact on the economy of the individual household, but this is hinged on the availability of productive land and water resources. This is an opinion paper that looks at the implications of the untapped potentials of urban agriculture for Lagos state while making suggestions for purposeful urban farming policies that could reduce poverty, enhance food security and improve the overall economy of the country. Urban agriculture is the activity of growing plants and raising animals in and around urban areas. Understanding how much land and water resources in Lagos could be productively used for agricultural practices and how much food could realistically be grown are important steps toward increasing knowledge and establishing a baseline for evaluating the potential costs and benefits of urban agriculture. This study also attempts to identify different spaces that could be allocated to farming in Lagos, including residential gardens, institutional farms, rooftops and vacant space. Considering a range of potential land, water, human and other resources, the ability to make Lagos state self-sufficient in terms of food production is assessed.

**Keywords:** *Urban agriculture; Urban farming; Implications of untapped potentials; Food security*

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### **Background to the Study**

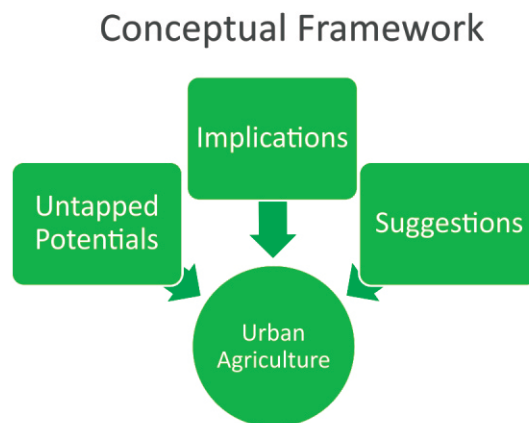
Food production in cities has long been a tradition in many countries around the world, and in recent decades, urban agriculture has become a mainstream in many developed countries, considering the fact that over half of the world's population (7 billion) are living in cities (United Nations Population Fund 2008) and about 200 million urban dwellers are estimated to be participating in urban farming all over the world. Studies also revealed that about fifteen percent of food worldwide is grown in cities (Smit, Ratta, & Nasr, 1996). Some people have the belief that the city is all about manufacturing and services and will be shocked to hear that farming can be a lucrative business in a city like Lagos, forgetting that many towns and cities in Nigeria grew out of farming and fishing communities where agriculture had, in the past, been the major occupation of the inhabitants. Urban agriculture plays an important role in increasing food security and social well-being by contributing to nutritional self-reliance, reducing hunger and malnutrition in urban areas around the world. Countries such as Cuba successfully used urban agriculture as a means to evade food shortages (Murphy, 2004), while many developing countries have long been farming within cities for income and subsistence (Nugent, 2001). Studies have shown that urban agriculture is gaining greater attention and has been expanding in many countries such as China, Singapore, Kenya, Uganda, Togo, Sierra Leone and Nigeria. However, most urban farmers are low-income dwellers who grow food largely for self-consumption and cash income, on small plots that they do not own, with little if any support or protection from the government.

Promoting farming in poor urban neighborhoods has been found to have a positive impact on the economy of the individual household, but this is hinged on the availability of productive land and water resources. This paper takes a look at the implications of the untapped potentials of urban agriculture for Lagos while making recommendations for purposeful urban farming policies that could reduce poverty, enhance food security and improve the overall economy of the country.

Lagos is the world sixth largest megacity, however, it is the least in terms of urban living standard among the twenty-eight megacities in 1991 (Linden, 1996; Oduwaye, 2005). UN study of 1999 predicted that the city of Lagos was expected to hit the 24.5 million population mark by the year 2015 and thus be among the ten most populous cities in the world (Lagos State Government, 2006). Lagos (the Centre of Excellence) is occupying a space of 3,577km square area, including lagoons and creeks. Land in Lagos is very expensive and a precious asset that is jealously guarded and keenly contested for by the governments, traditional rulers, property owners, land grabbers, and just anybody strong enough to peddle influence.

As Nigeria's commercial nerve centre with the highest concentration of manufacturing and service industries, Lagos attracts a high number of new entrants on daily basis from within the country and beyond, the World Economic Forum estimated that Lagos population rises by 85 people per hour; the result of which is high pressure on land, shelter and food. As such, managing the commercial activities should be a major concern for government and all stakeholders, especially when many of its residents approach every engagement from the business perspective and doing all they can to survive. The survival of people, the continuation of culture, and the existence of civilization are all linked to food, it is, therefore, natural that everybody wants and must eat, but curiously very few people are interested in farming particularly the youth who have very negative perception about agriculture. The youth see farming as dirty and non-rewarding, a trend that is a major threat to food security and the development of agriculture in the country especially as the ageing farming population needs replacement.

Statistical data on urban farming in Lagos is scanty but the population of urban farmers is observed to be on the increase. Urban farming in Lagos usually includes a variety of crops, vegetables, livestock, roadside horticulturists, and coastal fishing. As stated by Hardy et al. (1996), most cities draw on rural areas within their regional setting for food resources, but with some innovative approach, it might be possible to grow a decent amount of food within the city as a means of reducing poverty and enhancing food security.



**Figure 1.**

### **Definition of Urban Agriculture**

Although there are many definitions of urban agriculture by various organizations and authorities, a commonly accepted definition is yet to be developed. Urban agriculture is an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within a town, city, or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock (Smit et al.1996).

Urban agriculture is the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities (Bailkey and Nasr. 2000).

### **Types of Urban Agriculture**

Urban agriculture takes a different form depending on where and how it is been done. Common examples are as shown below:

1. **Home-Scale Food Production:** Community gardens, backyard plots, and school/educational youth gardens.
2. **Specialized Techniques and Infrastructure:** Rooftop gardens, aquaponics, hydroponics, and vertical farming systems.
3. **Activities can be anywhere:** Examples are Backyard, along rivers, along set back of public utilities (road, railway, and electricity power lines)

### **Potentials of Urban Agriculture in Lagos State**

Understanding how much land and water resources in Lagos could be productively used for agricultural practices and how much food could realistically be grown are important steps toward increasing knowledge and establishing a baseline for evaluating the potential costs and benefits of urban agriculture. This study aims to identify different spaces that could be allocated to farming in Lagos, including residential gardens, institutional farms, industrial rooftops and vacant space. Considering a range of potential land, water, human and other resources, the ability to make Lagos city self-sufficient in terms of food production is assessed.

Some of the identified potentials for urban agriculture in Lagos state are:

1. Lagos state owned 1,662 Public primary and secondary schools as of the year 2015 (Lagos state ministry of education).
2. About 100 slum settlements have been identified in Lagos state (federated nation). The slums are characterized by illegal and shanty structures, low quality and indecent living.
3. The state is blessed with a large expanse of creeks and the lagoon which used to be hubs of agricultural activities but has since been abandoned and taken over by militants.
4. Lagos Park and Garden agency saddled with greening and beautification of the city, built 327 City parks and garden and planted 6m trees as of 2015, it would be more beneficial if the government converts parts of them into recreational farms since many of the parks stay empty most of the time, while the trees that can provide health and nutritional benefits should be planted.
5. The city is having over 22% water surface area (Akinmoladun and Adejumo,2010).
6. About 1.2m residential buildings numbered out of many in Lagos in 2015 (LASSA).
7. Population over 21 million people (National Population Commission) mostly youths who are not interested in agriculture.
8. Renewed interest of the government in agriculture.
9. Akinmoladun and Adejumo (2005) in their studies reported that Lagos has an estimated 30,087 hectares of potential land (1,197 and 28,890) under federal and state jurisdiction.

### **Implications of the Untapped Potentials for Lagos State**

Here are some of the implications of the untapped potentials of urban agriculture for Lagos state:

#### **Deficit in local food Supply**

There is tremendous demand for foods in the cities far higher than what the cities can produce thus creating a huge supply gap that needs to be supplemented by foods coming from other places. A typical example is the fact that Lagos state cannot meet the fish need of its residents despite having 22% water surface, there is a supply deficit of fish from local sources up to 158,266 m tons in Lagos according to Ashiyanbi (2005).

#### **High Cost of Foods**

If less quantity of foods is grown in the city, it is natural that food will come to the city at very high cost. Incidentally, a huge proportion of the income of urban dwellers goes to food which agrees with the findings of Kerry (2004) that the world's poorest urban households spend between 50 to 90% of their income on food.

### **Food Travel long Distances and lose their Freshness**

Foods in the cities are mostly fresh arrivals rather than freshly harvested. Food must travel through a complex network to supply cities from farm to plate, at the same time expectations of food freshness continue to increase. Food with high durability can make the long journey to supermarket shelves, but the perishable ones get decayed shortly after harvest especially in situations where good storage facilities are not available. As of 2015, 2.3 billion tons of food, about one-third of the global food production, is lost or wasted annually. Loss and wastage occur in all steps in the food supply chain, and in developing countries, most loss occurs during production.

### **Health Risks**

Most food particularly fruits and vegetables get to the cities after long distances and duration of transportation from the farm of which they would have lost their freshness and nutritional value and yet still get consumed by urban dwellers. Also, Frozen foods like Fish, Turkey and Chickens are preserved with dangerous chemicals. According to Prof. Olusimbo of the University of Lagos, consumers of decaying food expose themselves to numerous liver and kidney diseases. The rotten food is a good medium for the growth of bacteria and fungi. They are dangerous to health and cause diseases. Consumers can have renal failure, liver failure and it can also affect the intestine, causing diarrhea and Septicemia, when the bacteria get into the bloodstream.

Medical experts believe that eating imported frozen poultry products can be a silent killer, as its negative effects do not present symptoms, sometimes, even for prolonged periods. The experts explain that such food has formalin, a chemical used to embalm corpse and other dangerous substances that increase chances of having terminal diseases. A Veterinary Doctor, Tito Adebajo, explained that the hazards caused by imported frozen foods to public health cannot be overemphasized since some of the chemicals used in the preservation of the animals could form residues in humans and eventually result in public health hazards.

### **Traffic Congestion**

Lagos markets and traders constitute major challenges to smooth traffic, the environment as well as enforcement of law and order. The popular Mile 12 Market is the destination for most fresh food items in Lagos and known for retailing in farm produce like pepper, tomato, onions, vegetables, fruits, yam and other edible goods, which are all stacked in heaps of baskets. Food of different types comes in from the South West, the East and North Central states. On the corridor of Ikorodu road, it is estimated that at least 50,000 vehicles are caught in the traffic daily with an estimated N8.4 billion been wasted annually in the traffic on the Mile 12 market axis alone. The gridlock also does a lot of damage to the health of motorists. Recently, a new study revealed that long-term exposure to traffic pollution is associated with an 18 percent increase in the risk of heart attacks.

### **Vacant plots and Creeks often Attract refuse or Crime**

The creeks have become criminal havens in Lagos state, the result is a wanton loss of lives and properties. Over four hundred youths called militants died in pipeline fire explosion in Isawo creeks in October 2015. The NNPC also reported a loss of petroleum products worth about N3 billion along the system B pipeline due to vandalism by the militants who also perpetrate other heinous crime like kidnapping, robbery, ritual killings, and pollution of the waterways.

**Other Associated Implications are:** The younger generations living in the cities do not know the source of their food; unemployment; high crime rate; low quality of living; out of school children; Illegal encroachment by illegal structures; the weather and pollution can affect their food supply; people in cities do not relate with farming anymore; political and economic instability.

### **Constraints to Urban Agriculture in Lagos**

Below are some of the constraints faced by urban farmers in Lagos:

1. Land both in terms of access and tenure security
2. Prohibitive urban policies and regulations
3. Limited access to agricultural input
4. Lack of support services
5. Harassment by tax and environmental authorities
6. Theft and insecurity on the farms
7. Marketing to promote direct farmer-consumer selling
8. High production costs coupled with lack of credit
9. Lack of organization among urban farmers
10. Lack of drainage within the farmland is another major challenge the farmers faced in Lagos as they suffer a loss of crops during the raining season. The farmlands get so flooded that farmers can't even enter their farms.

### **Benefits of Urban Agriculture**

Here are some of the benefits of urban farming:

**Increases food security:** Food security is having access to and being able to afford nutritious, safe food and enough of it. This is a major concern for many families all over the world. Fortunately, urban farming contributes to greater food security. The risk of going hungry is reduced through opportunities to grow food where one lives. People who live in food deserts, where no fresh produce is available, are given access to fresh nutritious food. Urban agriculture help guarantees control of one's own food system by empowering people with the right to grow, sell, and eat healthy food. Opportunities are also provided to grow and eat food that is free from chemicals, without paying high market prices. On the other hand, food insecurity means that households didn't know where their next meal was coming from on any given day.

**Community Development:** Urban farming is one way to bring urban dwellers together to establish a sense of community among people otherwise independent and, in some cases, isolated. People are brought together around a common interest, thus promoting positive intercultural interaction. Urban agriculture promotes cultural preservation by giving opportunities to people to grow the ethnic food they grew up with, thus passing on their authentic recipes to new generations.

**Health Impacts:** Urban agriculture promotes the production and eating of fresher, healthier food, herbs, vegetables and fruits which help in preventing food-related health risks and reduction in health care costs. Eating fresh produce reduces the risk of many diseases and the associated costs of treatment. People who are actively or even passively involved in fresh food production tend to cut down their consumption of fast food or other unhealthy food that causes diabetes and obesity.

Urban farming is a veritable tool for raising healthy kids. When exposed to growing food, kids generally eat more vegetables and fruits than those who do not know where food comes from. A healthy diet leads to a healthy life. Urban farming help improves the overall health of the community both physically and mentally. Working in the garden is a good physical activity that can help reduce stress, connect people to nature, quieting the mind and brings a sense of belonging.

**Efficient Use of Land:** We can efficiently use the land we do have to feed the people. Consider rooftop or vertical gardens: they take up minimal space but produce tons of fresh, healthy food. Many hydroponics systems are set up vertically, to fit anywhere even indoors.

**Crime Prevention/Safe Neighborhoods:** Crime rates may be reduced by creating access to affordable food, engaging troublesome youths in farming, creating jobs for the unemployed and reducing the number of vacant plots that are crime hotspots. Abandoned or Vacant plots are converted into beautiful, productive green spaces.

**Economic Impacts:** In a depressed economy with high unemployment, urban agriculture can create jobs, generate income, and promote financial stability. Urban agriculture presents a way for achieving economic stability through; training and business incubation, market expansion for farmers, decreased food expenditures, savings for municipal agencies, and increased home values.

**Environmental Impacts:** Urban agriculture helps in protecting the natural environment, and raising environmental standards. It increases green space, which reduces the urban heat island, storm water runoff, and improves air quality. Locally produced food reduces energy consumption and pollution associated with transportation (reduced food miles). Urban agriculture improves hydrology, soil quality, and biodiversity. Food waste is recycled and reused as compost and animal feed, likewise, waste water is recycled and used for irrigation.

**Education:** Urban farms give city dwellers a chance to produce their own food, and learn in the process. They learn about various gardening techniques, the best nutrient solutions, required sunlight, and controlling temperature, among other things. It engages residents in food systems, teaches them sustainable agriculture, and creates awareness of health and the environment. Apprenticeships on farms as well as involvement in youth and community gardens teach young people where food comes from and engage them in positive activity. Gardening can also be an effective tool in transition programs for people who are incarcerated or undergoing substance abuse rehabilitation.

### **Suggestions**

The following suggestions if implemented will go a long way towards protecting and promoting urban agriculture in Lagos state and Nigeria in general:

#### **1. Urban agriculture should be seen and use as a veritable tool for social and economic development.**

Urban farming is still in its early development in Nigeria. This presents an opportunity for Lagos state to become a pacesetter in urban agriculture and develop a robust economy by utilizing the untapped potentials.

## **2. Establishment of a state urban agricultural agency**

The agency will perform a comprehensive review of the city planning to ensure that urban agriculture and a sustainable food planning are integrated into operative documents as they are modified, renewed or produced, ranging from city's comprehensive plan to general land use plan. The agency which should be replicated at local government levels will be saddled with the regulation of the activities relating to urban farming and advising the government on policy formulation and implementation.

## **3. Formulation of policies to facilitate development of urban agriculture**

Public policy can be a critical instrument to facilitate and regulate urban agriculture. It is important to establish policies to prevent the adverse effects of urban agriculture, such as nuisance issues, and to help the smooth integration of urban agriculture into the urban setting. Established rules help to prevent speculation and conflict. They protect both the farmer's right to farm and the resident's right to enjoy home life. When residents know what to expect, urban agriculture can become a welcome use in urban and suburban areas. The government should make policies to reduce or remove existing, unintentional policy barriers and to adopt policies that help facilitate urban agriculture for instance; a properties and plots owner who participates in urban farming can get generous discounts or waivers on one or more of the charges levied by the state government.

## **4. Continuous land inventory update and allocation for urban farming**

There is the need for continuous land inventory update to be able to determine vacant spaces that could be allocated to urban farming, while vacant plots, creeks, and disputed lands across the city should be cleared and leased to urban farmers for short-term agriculture. Community organizations and garden clubs should be allowed the free use of public lands for community gardens.

## **5. Integration of urban agriculture into land use planning**

There is need to integrate urban agriculture into urban planning by establishing a greenbelt zone to halt urban development activities especially in cities like Lagos. This will also help in erasing the false idea that 'real' agriculture takes place only in the rural areas. With a good integration of urban agriculture into the town planning policies the ugly incident of traffic congestion induced by food market-related activities can be eliminated.

## **6. Provide access to suitable land for urban agriculture activities.**

The land is the most important element for agriculture. Since land is expensive and under development pressure in urban and suburban areas, urban farmers have difficulty with land tenure and security. When permanence cannot be guaranteed, it is difficult to invest. It takes a while to prepare the soil for intensive organic production. Urban farmers need government help to find and secure land for farming.

## **7. Establishment / reactivation of farm in schools**

There is need to create a school garden program and build a farm at every school that will avail school pupils the opportunities to learn and know how to grow their own food. Schools should be encouraged to establish agriculture or gardening clubs as an extracurricular activity.



#### **8. Edible landscaping**

Lagos Park and Garden Agency (LASPARK) should embrace the use edible landscaping as an alternative to conventional landscaping which is another way to promote and facilitate urban agriculture. Edible landscaping is the use of fruit-producing plants in the constructed landscape and parks. Its popularity has been increasing, because it provides not only beautiful urban landscapes but also convenient healthy food. Usually, a combination of fruit and nut trees, berry bushes, herbs, vegetables, and edible flowers are arranged in an aesthetically pleasing way in residential and commercial landscapes. Edible plants are also used in public places such as parks, streetscapes, road rights-of-way of public utilities and medians, and government buildings. Fruit and nut trees may be used as street trees, and berries and herbs may be more appropriate for medians. The produce in these public places can be consumed by the public, which is another avenue to provide access to healthy and affordable food.

#### **9. Water resource management**

The Environmental Protection Agencies in collaboration with water resources should ensure that there are measures to minimize the pollution of water sources to farming. This could be achieved through the provision of guidelines and standards for the industries. At the farmers' level, awareness of water pollution and source protection should be promoted.

#### **10. Promotes composting and use of organic manure**

The government in collaboration with environmental experts should sensitize more urban farmers on the advantages of using organic manure. Composting is the basic necessity of sustainable urban farming. It helps recycle organic waste into nutritious soil amendment or even a medium to grow plants that are far more effective than chemical treatments.

#### **11. Adequate provision of farm inputs and support services**

Necessary farm inputs should be provided to urban farmers to help them increase the amount of food available and enhance the freshness of perishable foods reaching urban consumers. Urban farmers should be provided with training on infrastructures and specialized urban farming techniques like rooftop gardens, aquaponics, aeroponic, hydroponics, and vertical farming systems.

#### **12. Establish community gardens in all neighborhoods**

Community gardens promote food sovereignty, food security, community development, and healthy living. Having a community garden in each neighborhood would increase access to healthy, affordable, and culturally appropriate food, which in turn would help decrease food related illnesses.

#### **14. Promoting the interest of the youths in agriculture**

The interest of the youths in agriculture can be promoted through value addition approach like processing, packaging, drying, fermenting, distilling and transportation; capacity development in agric value chain; organizing reality shows (Celebrities as the role model) where youth can showcase their knowledge of how to grow their own foods. The young generations can also be enticed into engaging in agriculture by establishing urban agriculture summer camps for youth and encouraging youth apprenticing in urban farms. In addition, the success story of youth in agriculture should be celebrated.

## Conclusion

Urban Agriculture can play a crucial role in building more livable cities as it is a common practice among the majority of urban dwellers both the poor and the wealthy. Urban Agriculture should find a place in the city policies as a measure to improve the quality of life of its residents. Furthermore, urban agriculture should be regarded as a veritable tool for poverty reduction, enhanced food security, health benefits, socio-economic activity, environmental protection, education, etc in urban management activities.

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