Prospects and Challenges of Urban Agriculture in Nigeria: Towards a Policy Framework for Sustainable Food Supply in Urban Centres

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Abstract
The influx of migrants from rural areas in search of better economic prosperity has led to a double edged tragedy. First, it accounts for less food production from rural areas. Secondly, it has led to continuous increase in urban population causing congestion, food insecurity, poverty and deteriorating quality of life. Elsewhere, many nations have incorporated urban agriculture (UA) as a supplementary effort to food supply to urban centres and the food and agricultural organization (FAO) is encouraging this trend vigorously. Urban agriculture is not new or geographically isolated to a country. The United Nations Development Program estimated that fifteen percent of food worldwide is grown in cities. Countries such as Cuba successfully used UA as a means to evade food shortages, while many developing countries have long been farming within cities for income and subsistence. This paper reviewed the status of UA in Nigerian cities, its challenges and prospects for augmenting food supply to urban centres. In Nigeria, UA is practiced but in uncoordinated manner and not much can be deduced from its contribution to food supply in the urban centres due to lack of statistics and none inclusion in urban planning. Scanty literature is available for some cities such as Lagos, Abuja, Jos and Kwara but none exists for several fast growing urban centres such as Port Harcourt city where 90% of petroleum production takes place. Urban agriculture can become a strategic means of meeting the increase demand for food in such cities if well harnessed.

Keywords: Urban Agriculture, Challenges and Prospects in Nigeria, Policy Framework

1.0 Introduction

The influx of migrants from rural areas in search of economic prosperity as well as increasing population in the cities has led to rapid urban population growth in many cities of the world leading to congestion and deteriorating quality of life (Adedayo and Tunde, 2012). By 2020, the developing countries of Africa, Asia and Latin America will be home to some 75% of all urban dwellers, and to eight of the anticipated nine megacities with population in excess of 20 million (Hoornweg and Munro-Faure, 2010). This process is usually accompanied by poverty and hunger because it places huge demands on the urban food supply system. With this
burgeoning numbers, the task of satisfying their hunger with food supply from only the rural area will be impossible. This urban mass exodus is exacerbated by migrants of abled-bodied men and youth leaving the disadvantaged groups (women, children, elderly, retired and people terminally ill) in the rural areas to perform agricultural operations with simple implements which cannot sustain their subsistence production let alone for supply to the cities (Adedayo and Tunde, 2012). Hence, the need to increase food production in urban space in order to meet up with urban food requirements.

Many countries are taking advantage of a complementary strategy called Urban Agriculture which is gaining prominence and recognition all over the world. If well harnessed, urban agriculture can contribute to urban food supply and can represent an important economic activity. Urban Agriculture is not a new concept but it has been receiving renewed interest as a means to boost urban food supply. A United Nations high level task force on global food crisis explicitly recommends that:” A paradigm shift in design and urban planning is needed that aims at reducing the distance for transporting food by encouraging local food production where feasible within city boundaries and especially in immediate surroundings (UN, 2010). Although most global food production has and will continue to take place in rural areas, it is clear that for obvious reasons, urban solutions will have to be found to help keep the cost down, reduce the distance food must be transported and provide fresh food.

Urban Agriculture has been practiced in developed nations with varying degrees of success such as in London (Garnett, 2000), Detroit (Carmody, 2010) in the USA, Sofia (Yoveva et al., 2000), Hong Kong (People and Planet, 2000), China and Singapore (Yueng, 1985), Israel (Freeman, 1996) and in developing nations as Cuba, Bueno Aires (UNDP, 1996), Kenya (Freeman, 1991), Uganda (Maxwell and Zziwa, 1992), Togo (Equziabher et al., 1994), Accra, Kumasi, Nairobi, Dar es Salaam, Dakar (Foeken and Mwangi, 2000; Jacobi et al., 2000; Veenhuizen and Dansa, 2007).

The international importance of UA is well illustrated by the fact that an estimated 15-30% of world food supply is grown in the urban area (UNDP, 1996). UNDP (1996) and FAO, (1999) estimated that about 800 million urban dwellers now participate in urban agriculture, of these 200 million people are market producers employing 150 million people full-time. The numbers are increasing. According to World Bank, (2002), urban Agriculture is a significant economic activity central to the lives of hundreds of millions of people throughout the world. It has also been seen as a pathway out of poverty (World Bank, 2008). Urban Agriculture is critical for improving food security and safety. Appeaning-Addo, (2010) opined that Urban Agriculture contributes 50% to food security and safety worldwide. Many organizations including FAO and UNDP are pursuing this trend UA vigorously by supporting the transformation of Urban Agriculture into recognized urban land use and economic activity, integrating into national and local agriculture development strategies, food and nutrition programmes and urban planning. FAO also provide technical programmes to support the work of urban Agriculture partners in cities and help member countries develop the sector via data collection on Urban Agriculture’s contribution to food security.
In Nigeria, many cities and towns grew out of farming and fishing communities where agriculture had in the past been the major occupation of the inhabitants (Ezedinma and Chukuezi, 1999). This contributed largely to economic development and food security in Nigeria. In the 1960’s, the Agriculture sector employed over 80 percent of the working population and contributed significantly to Gross National Product (GNP) in Nigeria (Adedayo and Tunde, 2012). However, since the 70’s, the oil sector displaced agriculture while able-bodied men and youths migrated to the cities in search of better economic prospects leaving the underprivileged groups to produce food for the nation. Recent studies have shown that UA in Nigerian cities has become more widespread after the structural adjustment of the economy in the 1980’s (Kareem and Raheem, 2012). Many urban dwellers were compelled to engage in Urban Agriculture due to increases in food prices, unemployment and inflation.

Notable research carried out in Nigeria on Urban Agriculture are in Ibadan (Gbadeyesin, 1991), (Aina et al., 2012), Lagos metropolis (Adedeji et al., 2001), Kano(Lynch et al., 2000; Olayiwola, 2008), Kwara (Adedayo and Tunde, 2012), Osun (Oladejo et al., 2011), Nasarawa (Salau and Attah, 2012), Cross River (Ibok et al., 2014). Urban Agriculture in Nigeria like many developing countries is uncoordinated, not recognized and given its rightful place by relevant policy makers, urban planners and government officials as an important urban land use. There is also non-availability of data on the contribution of UA to food supply in the urban area in Nigeria. This paper therefore reviews the status of UA in Nigeria, types of Urban Agriculture, benefits and challenges, success stories of UA practices by countries and policy options on how to integrate UA into the city system to ensure sustainability of food security in Nigeria.

2.0 Rational of Urban Agriculture (UA)

Veenhuizen, (2010) defines UA as the growing of plants and the raising of animals for food and other uses within and around the cities and towns and related activities such as production and delivery of inputs and the processing and marketing of products. According to Mougeot, (2005), UA is the cultivation of crops and rearing of nationals within the perimeters and open spaces of the city. It can also be simply defined as the growing of plants and raising of animals within and around cities (FAO, 2014). Urban Agriculture UA can be practiced on vacant plots, in fish ponds, in school gardens, on open spaces, along railways, below power lines; on river banks, on communal lands for community based gardens, parks, road sides, around institutions such as barracks, prisons and places of worship. With an estimated 2.5 billion people living in cities globally (Akinmoladun and Adejumo, 2010), tackling food security will be top priority for government all over the world for some years to come. The key to solving this problem is by engaging in Urban Agriculture and a viable economic activity augmenting the supply of food from rural areas. The evidence in Africa and other parts of the world show the potential of UA for food security is real and overwhelming if well harnessed (Olayiwola, 2008). UA is seen in many cases as a response to food crisis, an urban livelihood strategy (Sawio, 1994), a food coping strategy (Rakodi 1988) and a poverty alleviation strategy for the urban poor (Jacobi et al 2000; Karcom-Raheeim, 2012).
3.0 Types of Urban Agriculture

Commercial Farms

The USDA defined small farms as those when generate less than $250,000 (N37.5 million) in gross sales. By this broad definition, small farms make up 92 percent of New York’s 32,000 farms into three categories: (1) recreational farms which sell less than $10,000 annually and consist of less than 100 acres; (2) adaptive farms which sell 810,000 (N1.5 million) or more annually of high-value product and are 100 to 200 acres in size; and (3) traditional farms which sell greater than $10,000 annually or high value product and are greater than 200 acres. Recreational farms make up 18 percent of metropolitan farms, 14% adaptive farms and traditional farms account for 33 percent of all metropolitan farms (CSFC, 2003).

Community Gardens

Community gardens are large plots of land that have been divided into smaller plots for each household’s use. The plots can be owned by a municipality, an institution, a community group or private ownership. The farmer keeps production for him/her, family and friends (CSFC, 2003).

Backyard Gardens

Urban backyards are plots around homes, including balconies, decks and rooftop. High yield can be raised even in the simplest of containers. Backyard gardens grow or raise, produce honey, small animal and fish (CSFC 2003).

Institutional Farms

These are lands found within the premises of institutions like schools, government offices, barracks, prisons, restaurants, churches and mosque that are used for agricultural production on a small or medium scale. They produce food, fruits and ornamental plants. Marketing of products is done directly at the gardens, bazaars or at shops that belong to the institution.

Market Oriented Agriculture

Production can take place on private or public properties. Commercial food at small, middle or large scale, diverse type of production methods, ornamental plant production, apiculture, poultry raising, stock breeding. Products are sold in the local market and shops.

4.0 Benefits of Urban Agriculture

Urban Agriculture has brought about substantial benefit to many cities and towns. It has contributed to food security, urban livelihood, and environmental sustainability and strengthen cities resilience to climate change. UA also addresses many other social, economic and environmental concerns.

Women Empowerment

UA can be seen as a form of empowerment for underprivileged people, in that it affords people an opportunity to increase control over their on nutritional intake. This can be particularly significant for women, who have been excluded from food production activities. A study
undertaken in Harare, Zimbabwe (Mbiba, 2005) which found that woman produced 60 percent of urban food production, the majority consumed by household members.

**Energy Conversion**

UA can help contribute to reducing the net discharge of carbon dioxide, one of the gas contributing to global warming from human activities in cities. UA also help to reduce food miles (distance food must be transported from production to consumption) lowering fossil fuel use and transport costs.

**Biodiversity**

A wide range of species can be grown in terms of crops or plants that are not usually found in the area UA also encourages beneficial soil micro-organism, insects, birds, reptiles and animals. It also provides birds and butterflies with food, resting spaces and protection along migratory flight paths.

**Microclimate improvement**

UA helps make a city a heat their lace by the microclimate of an area because vegetation can help increase humidity, lowers temperature and introduces more pleasant odours, captures dust and gases from polluted air, helps break wind and intercept solar radiation creating shades and protected places.

**Urban Greening**

UA can add greenery to cities thus improving the quality of the urban environment and reducing heat island effect. Ornamental plants provide aesthetics and help beautify urban landscape.

**Waste Management**

Organic waste from cities can be composted and used as fertility resource and bio gas production. The application of waste to urban crops can make a significant impact in easing the challenges to the development of urban agriculture in Nigeria existing burden on waste disposal system.

5.0 **Challenges to the development of urban agriculture in Nigeria**

In Nigeria, the existing land use policy make it difficult for poor urban farmers to access land resources. In the absence friendly land use policy, city farmer are subjected to harassment and eviction from even government lands.

**Access to credit and other financial services**

Small farmers continue to face problem in accessing financial services that will enable them carry out their farming activities in a businesslike manner.

**Health**

There are health concerns associated with UA which is frequently affected by untreated waste and other pollutants that are discharged directly into water courses, onto land or into the air. The contamination of soils and water courses can lead to dangerously high heavy metals and toxin levels in agricultural produce.
Lack of Recognition

UA has been largely ignored by relevant city authorities. Government officials, city planner and policy makers perceive UA as a marginal, temporary and archaic, a practice that is actually harmful to consumers, the environment and the city’s appearance, (Urban Agriculture 1996) that does not belong in the city.

Lack of organization among Farmers

Though they may have an “official” association, they have not be able to organize themselves in such a way as to attract official recognition in order to benefit from some government and corporate incentives such as credit, financial assistance and input subsidies.

Lack of support services

Extension services are usually for rural farmers and not their urban counterparts which hinder access to improved seedlings, pesticides, equipment, feed, medicine and technical training.

Vandalism and Harassment

Urban farmers sometimes experience theft of crops when farmers household are far from their farms and harassment by local and state government tax and environmental authorities.

Gender issues in UA

In many cities, studies have shown that it is mostly women who are involved in urban agriculture. There exist legal and cultural biases against women owning or even leasing land making their attempt at UA even more difficult.

Legal and institution constraints

Reluctance to change the legal status of UA stems partly from biases against UA on the part of urban authorities and partly from concerns about food safety, health and environmental impact of UA. In many cities agriculture remains technically illegal despite potential benefits.

6.0 Urban Agriculture in Cuba, Israel, Tanzania and Nigeria

In Havana, Cuba UA has recorded huge success in its implementation. After the collapse of Soviet Union, Cuba which was dependent on food imported from Soviet Union faced a major food crisis. Cuba not only lost a trading partner but an important ally and source of fossil fuel. This situation was further worsened with the U.S trade embargo. This marked the beginning or serious food crisis that shocked the entire country, and most of all, Havana. When these source where cut off and food shortages began, the only solution was to start growing their own food. The scale of the problem was so huge that the president, Fidel Castro declared that people should grow food everywhere available. Havana residents responded, planting crops on porches, balconies, backyards, empty city plots. The Cuban government and Havana city government supported this grass root movement jointly forming the urban Agriculture Department in 1994. Havana UA has taken on many forms ranging from private garden (huertos privados) to state owned research garden (organoponicos) unique to Cuba and Havana’s popular garden (huertos populario). Urban Agricultural work force in Havana is about 117,000 people. They produce 25,000 tons 170,000 birds, 3,500 female rabbits. Produce 58% of vegetables from Havana alone.
In the nation of Israel, 95% of food requirements are obtained from city farming (Freeman 1996). Israel’s is characterized by high technological level, pressure irrigation system, automatic mechanization and high quality seeds and plants. Israel produces 5 million tons of field crops, 1.15 billion litres of milk, 1.6 billion eggs and 1.2 billion flowers for export (Ministry of Agriculture 2006).

Water scarcity is a main limiting factor in Israel’s agriculture so the country depends on irrigation to increase its crop yield; about 50% of the land is irrigated. Of the 1,129 million cubic meters of water used by agriculture per year, 30% of agricultural water is treated waste water for drip irrigation of orchards and non-food crops while 16% is saline water. Dar es Salaam’ contribution of UA production to urban employment, income and food expense savings. 90% of leafy vegetable is produced in the city, 60% of milk, 20%-30% of food consumption produced by 50% of household (Mougeot 2005). UA has received attention and support on various policy levels and is accepted as a land use in the city. In the Strategic Urban Development Plan (SUDP), special land-use zones have been designated for agriculture. In 1993, poultry rearing produced 1.9 million; 33,564 pigs and 40,930 goats (UA Magazine Special Action World Summit, 2002). In 1993, the city’s policy makers found that agriculture in the city contributed substantially (30%) in household food supplies and it became an urban livelihood strategy. UA forms at least 60% of the informal sector and is the second largest urban employer. The annual gross output of over ten thousand urban agriculture enterprises in the city of Dar es Salaam totaled more than 25 million USD (Cofie et al 2003).

General agricultural activities in Nigeria, according to Lawal and Atte, (2006) contributed to the economy in the overall reduction of poverty, accounting for 50% of government revenues in the 1960s with well over 80% of export earning with the sector employing more than two third of the country’s total work force. While in the area of urban and peri-urban agriculture, according to Aina et al., (2012) long sustained practices are not new. It began long before independence in 1960 and received recognition due to economic down turn of the Nigerian economy in the 1980’s as a result of government effort of correcting the economy through the structural adjustment program (SAP). Aina et al., (2012) observed that agricultural activities located within or the fringe of urban areas serve as shock absorbers to the poor, means of livelihood and income to farmers covering horticulture, floriculture, agro-foresting, aquaculture and livestock production corroborating the works of Lynch (1995), Olofin, (2006) and Maconachie (2011) where they explained that in and around Africa, towns and cities have for long shown interest in food production in efforts to attain food security among urban residents. UA is fast gaining recognition as a viable intervention strategy for the urban poor to earn extra income and produce food. Egbuna, (2009) observed that UA in less developed countries is moving the economy and generating a lot of income intense of millions of US Dollars. The report further argued that UA is an important source of supplying urban food and one food security option for poor urban households with about 200 million globally active in the endeavour. In their work on socio-economic analysis of urban Agriculture, Salau and Attah, (2012) revealed that UA bring additional income to farmers, increase household feeding and
generating full time employment opportunities and around fringes of urban areas supporting lots of people, citing Nigerians as one of the most urbanized African country with over 35% of its population living in towns and cities. Salau and Attan, (2012) work in Nasarawa state of Nigeria and reported that UA in their study area has developed a means of bridging seasonal gaps in the supply of fresh fruits and vegetation’s to the urban dweller of the state; supporting the findings of (Andres and Lebailly, 2011; Dossa et al., 2011 and Abdulkadir et al., 2012) in different parts of sub-Saharan Africa. The work of Adeogun et al., (2007) was a specialized one looking at urban aquaculture in Lagos, Nigeria. They studied the producer perceptions and practices of aquaculture as an excluded or neglected area of researchers that worked on urban food security no a result of incessant rural urban drift in Nigeria, they seem to suggest that with focus attention on urban aquaculture, food security will be highly enhanced. Inequalities between men and women in their access to productive resources, services and opportunities are one of the causes of under performances in the agricultural sector and contribute to food insecurity, deficiencies in economic growth and development. In that work on challenges of women in UA in Kwara state (Adedayo and Tunde, 2013) reported that women are the main food producers in developing countries and yet among the most disadvantaged group. Winrock International, (1994) reported that in sub-Saharan African although women make up 60-80% of agricultural labour force, they receive only 4-8% of extension visits. This may not be the case in all African countries but a significant anti-female bias nonetheless does exist in most. Wages for women in agriculture averaged roughly to 20% of men’s wages (Duchin Sinha, 1999). Streffler, (1993) further reported that women engaged in urban Agriculture also have unequal access to markets, inputs, land and credit. In many cultures, women are prohibited from owning land sometimes leasing it. For there to be meaningful progress in UA, agricultural policies should redress gender inequalities. Studies have shown that women dominate urban Agriculture and in some cases South African synonymous with farming by women.

7.0 Prospects of UA in Nigeria and Promotion of UA through Policy and Action

In Nigeria, poor urban household spend between 60-80% of their income on food. For them UA will offer an opportunity for a better diet and increase disposable income spending on other needs such as health care and housing (Rabinovitch and Schmeter, 1997). Most Nigerian cities grew from farming communities and before the discovery of oil in the 1970’s, the agricultural sector contributed significantly to GDP and employed more than 75% of the working population at that time. Nigeria is blessed with fertile soil and good climate to grow variety of crops in our cities. With the right legal and institutional framework and better coordination of the farmers, the prospects in Nigeria are great. Nigeria can also take advantage of a new trend many cities are adopting around the world where re-using of plastic containers, feed sacks and tires are used to grow crops around the house, offices and open spaces. Also in communities that have been devastated by oil spill, farming can be done by making raised beds, constructing hydroponics and aquaponics so that food production can continue to provide a means of livelihood pending when the lands have been remediated.
UA should be regarded as an integral part of the urban economy in terms of income, employment and food system. Therefore the under-mentioned are recommended for policy options and actions.

- The use of a participatory policy making approach. It is imperative that there should be involvement of a broad spectrum of stakeholders with farmers, urban planners, environmentalist, and health officials to deliberate and propose policies that will meet the needs of everyone.
- Provide probative temporary occupancy permit (TOP) for urban farmers using private or public open spaces. This will solve the problem of access to land for the urban poor. Land is lent directly by the landowners or indirectly by the local government.
- Support the organization of poor urban producers to manage UA in more effective ways through training, supply of extension workers, research and educating them on improved methods in crop cultivation.
- Develop effective policies that protect the rights of women and other vulnerable groups.
- Increase public awareness towards the benefits of UA and educating professionals so that it can be integrated into urban and regional planning.
- Agricultural officials should sensitize urban farmers on the advantages on the use of organic manure. Waste management departments should recycle city organic waste into organic manure and make them readily available and affordable to the farmers.

8.0 Conclusion and Recommendations

There is food shortage in the world and developing nations such as Nigeria are worst hit despite availability of massive expanses of arable land. This review revealed that the twin challenge of rural to urban migration of abled bodied men and women and consequent influx of migrants to the cities in search of better socio-economic status has resulted to less food production from the villages and congestion in the urban centres leading to food shortage and accompanied consequences. Urgent steps are required to tackle the food shortage or risk millions of people starving to death. The concept of Urban Agriculture which has been in practice for centuries offers the prospects to be a veritable tool in the hands of well-organized systems of the world for solving or at best augmenting the shortage of food supply to urban centres with varying degrees of successes around the world. In Nigeria, urban Agriculture is evident on almost every open space, plots of lands, gardens and parks and since it is a developing nation, developmental projects normally replaces or at best intercalate with farms in the semi-urban and urban places. Although this farming system is evident in the country, it is not coordinated and faces a number of challenges. In addition, data is scarce on its contribution to urban food supply in the urban centres, a lacuna that needs to be filled to enable policy makers appreciate this veritable tool for augmenting urban food supply. This farming system which has great prospects to augment food shortage to urban centres in Nigeria has remained neglected and obscured.
It is recommended that governments at all levels should not only take advantage of but also promulgate policies to invigorate UA with the aim of sustaining food supply to urban centres in good condition.

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