

Review Effects of Urban Agriculture in Nigerian Cities

Gladys Ogochukwu Chukwurah

University of Nigeria

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Abstract

Urban agriculture is becoming an issue of concern because of food insecurity in the country. This paper examines the types and effects of urban agriculture in Nigerian cities for sustainable urban planning and development. Based on qualitative approach, the study employs the secondary sources of data such as internet search engine. Descriptive analyses were used for the analyses. Findings revealed, crop cultivation, street landscaping, forest gardening, animal husbandry, dairy farming, poultry farming, aquaculture/ fish farming, bee keeping/ farming (apiculture). Findings also shows some of the benefits of urban agriculture such as food security, environmental conservation and employment, among others, while water pollution, air pollution, food contamination among others are the likely negative effects of urban agriculture. The study therefore recommends that urban agriculture be integrated into the land use planning with policy measures to ameliorate the negative effects for urban sustainability.

Key words: *Urban Agriculture, Effects, Environment, Urban Sustainability*

Introduction

urban agriculture, is one of the tools in achieving a sustainable environment, through ensuring food security, reducing the cost of leaving by ensuring easy access to inexpensive and healthy food, environmental preservation and conservation (Ratta, N.2001). Urban Agriculture can be seen as a changing concept that composes of a variety of farming systems, ranging from subsistence production and processing at the household level to fully commercialised agriculture (Aldington T 1997). The definition of urban agriculture is diverse because a large variety of urban farming systems is encountered, based on the local socio-economic, geographical and political situation (Brown, N.2008). Urban Agriculture can be seen as industries located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) 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. Urban agriculture entails Crop production, animal raising as well as fish-farming in and around cities, food production as well as non-food production (flowers, trees, pot plants for example), processing and marketing of food and non-food products produced in and around the urban area, it uses compost and (treated or untreated) urban wastewater as resources and may take place on open land areas in the city as well in backyards or on rooftops (Bonhotal, J., 2008).

According to World Food and Agriculture Organization (FAO, 2007) urban agriculture is defined as “the growing of plants and the raising of animals for food and other uses within and around cities and towns, and related activities such as the production and delivery of inputs, processing and marketing of products”. Urban agriculture is defined as: all food production (both animals and plants) in the urban and peri-urban area. Urban agriculture in its simplest term can be defined as food production (For example, fruit, eggs, fish, meat, non-food items such as ornamental plants, fuel, flowers and trees seedlings) within cities and its periphery; which could either be for commercial purposes or for home consumption. It is the act of producing food within urban municipalities for both commercial purposes and for household consumption (Dina et al., 2002). The benefits of urban Agriculture include an increase in food supply and income to urban families, urban agriculture also has an important significance to global sustainability (Binns T, Lynch K 1998). The production of food close to the consuming market reduces the need for transportation, therefore reducing the consumption of fossil fuels and the associated emissions of CO₂. It plays a role in addressing urban nutritional deficiencies, unemployment and increasing urban poverty, which were mostly brought about by rapid rural-urban migration, structural adjustment policy, economic transition, and improved agricultural policies (Crush et al., 2011).

Though there are many benefits of urban Agriculture in an urban area, there are still downsides or problems which arises from its practice in an urban area.

Though some studies have been done on urban agriculture, Adedayo (2014), however none of these studies have examine the prevailing types of agriculture practice in the urban area from the stakeholders’ perception. This is a gap which this current study wants to fill. Therefore, this study examines the various types of urban agriculture practiced considering the positive and negative environmental effects. The study is necessary to provide awareness of the prevailing types of agriculture practiced in the urban area. the information from this study will provide a guide for policy makers and land use planners on the sustainability of urban agriculture. It will also serve as a reference for further study.

Lal, Rattan (2014) note noise and air pollution, which is caused by poultry farming or animal rearing caused by the offensive smell from poultry farms. Some of these negative impacts include soil erosion which is due to overgrazing, chemical pollution of the soil which is due to intense use of pesticides and chemical fertilizers for the growth of food crops, water pollution which is caused by chemical and pesticide use in agricultural production. These problems that arise from the practice of urban agriculture have negative impacts on the environment, health, social life of the people and the aesthetical condition of the environment. Nonetheless, many of the above-mentioned issues can be addressed via education, infrastructure development, and intelligent foresight in an effort to create sustainable, inclusive urban agriculture systems that provide environmental, social, and economic benefits to local communities and also applying the efficient method of waste handling and management systems. The practice of urban agriculture in small scale within plots has limited the potentials of urban agriculture ensuring food security, being a means to ensuring foreign exchange and revenue generation for the increase in the standard of leaving of citizens and as well the development of the urban area.

Results and Discussions

Types of Urban Agriculture

Urban farming is more than just a sustainable food trend or a way to organize your harvest. Urban agriculture offers the opportunity to provide fresh, local food to urban communities. The various types of urban agriculture which are obtainable in the contemporary era include:

➤ Crop Cultivation

This is a branch of urban agriculture that deals with the cultivation and production of crops and plant material either in a subsistent quantity or for commercial purpose. Commercial agriculture or crop production will bring about the production of cash crops (Schwarz, 2008). This can bring about food production in a large quantity for a large population of people in the urban area.

➤ Street Landscaping

This is the landscaping of streets for different uses such as community gardens, which are tended to by the people in the neighbourhood. They not only make the streets look beautiful but also purify the air creating a clean environment. Since they are primarily located along the street, their added advantage is their capability of reducing urban storm water runoff.

➤ Forest Gardening

It pertains to the practice of having gardens grown within an urban forest. Forest gardening is achieved by having different crops, vegetables, and fruits grown within urban settings. Forests usually create an environment that is favourable for crop development and for this reason, they help in ensuring that forests are protected and can make deforestation a nonfactor in urban settings. Forest gardening can also be part of afforestation efforts, which encourage the planting of trees as a step towards the fight against global warming in urban areas.

➤ Animal Husbandry

This is the practice of rearing animals for food in urban settings. An urban dweller can choose a location suitable for keeping different types of animals or focus on specific animals such as poultries, goats, rabbits, or sheep. Some cities limit the number of animals one can keep and also the type of animals that can be kept.

Animal husbandry involves livestock raising and selective breeding. It is the management and care of animals in which the genetic qualities and behaviour of animals are further developed for profit (Webster, John, 2013). A large number of farmers depend upon animal husbandry for their livelihood. Animals provide us with a variety of food products which have high nutritional values. Therefore, they require a lot of care and attention. Animals are bred commercially in order to meet the high demand for food. Dairy products from animals like cows, buffaloes, goats, are rich sources of protein. These animals are called milk animals as they provide us with milk.

➤ Dairy Farming

Dairy farming is the agricultural technique concerned with the long term production of milk, which is then processed to obtain dairy products such as curd, cheese, yoghurt, butter, cream, etc. It involves the management of dairy animals such as cows, buffaloes, sheep, goat, etc. The animals

are taken care of against diseases and are inspected regularly by veterinary doctors. A healthy animal is physically, mentally and socially sound. These animals are milked by hand or by machines. The milk is preserved and converted into dairy products industrially, which are then used for commercial purposes.

➤ Poultry Farming

Poultry farming is concerned with raising and breeding of birds for commercial purposes. Birds like ducks, chickens, geese, pigeons, turkeys, etc. Are domesticated for eggs and meat. It is very important to take care of the animals and maintain them in a disease-free environment to obtain healthy food from them. The eggs and meat are a rich source of protein. Sanitation and hygienic conditions need to be maintained. The faeces of birds are used as manure to improve soil fertility. Poultry farming provides employment to a large number of people and helps in improving the economy of the farmers (Cai, T., Pancorbo, et al ,1994).

➤ Aquaculture/ Fish Farming

FAO FIGIS Database (2022) Aquaculture which can also be known as fish farming is the process of raising fish in closed tanks or ponds for commercial purposes. There is an increasing demand for fish and fish protein. Fish species such as salmon, catfish, cod, and tilapia are raised in fish farms. Aquaculture is the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants and implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated. In practice it can take place in the sea or in freshwater, and be extensive or intensive. Whole bays, lakes or ponds may be devoted to aquaculture, or the farmed animal may be retained in cages (fish), artificial reefs, racks or strings (shellfish). Fish and prawns can be cultivated in rice paddies, either arriving naturally or being introduced, and both crops can be harvested together. Fish hatcheries provide larval and juvenile fish, crustaceans and shellfish, for use in aquaculture systems. When large enough these are transferred to growing-on tanks and sold to fish farms to reach harvest size. Some species that are commonly raised in hatcheries include shrimps, prawns, salmon, tilapia, oysters and scallops. Similar facilities can be used to raise species with conservation needs to be released into the wild, or game fish for restocking waterways. Important aspects of husbandry at these early stages include selection of breeding stock, control of water quality and nutrition. In the wild, there is a massive amount of mortality at the nursery stage; farmers seek to minimise this while at the same time maximising growth rates.

➤ Bee Keeping/ Farming (Apiculture)

This involves the rearing of bees for its economic value which is the production of honey.

Bee farming or apiculture is the practice of maintaining bee colonies by humans in man-made hives. Honey bees are reared on a large scale. The bees are domesticated for honey, wax, and to pollinate flowers. They are also used by other beekeepers for the same purposes. The place where bees are kept is known as an apiary or a bee yard.

Fixed comb hives are used in many parts of the world and are made from any locally available material. In more advanced economies, where modern strains of domestic bee have been selected for docility and productiveness, various designs of hive are used which enable the combs to be

removed for processing and extraction of honey. Quite apart from the honey and wax they produce, honey bees are important pollinators of crops and wild plants, and in many places hives are transported around the countryside to assist in pollination.

Effects of Urban Agriculture on the Environment

The studied discovered many positive impacts of urban agriculture, however not without any negative impact. The benefits of urban agriculture extend beyond better nutrition, poverty reduction and jobs for the poor, offering an opportunity for a better diet and a chance to shift household spending toward other needs, such as health care and housing and being a source of financial empowerment to the poor. It has a lot of positive impacts which includes the following:

- Urban Agriculture contributes to food security in several ways, by increasing the amount of food available and enhances the freshness the freshness of perishable foods reaching urban consumers.
- It also offers opportunities for productive employment in a sector with low barriers to entry. The intensive horticultural and livestock production that thrives in peri-urban areas employs workers and produces high value-added products that can yield reasonable income and returns.
- Urban agriculture compliments rural agriculture and also increases the efficiency of the national food supply. It can be a substitute for food imports intended for urban consumption and thus save on foreign exchange. It can also make available good rural agricultural land for export-oriented production (Binns and Lynch, 1998).
- Waste-management (avoided costs of waste disposal), use of under-used resources (rooftops, roadsides, and water bodies), economic diversity/stability, changes in economic value of the land, and possible multiplier effects (business attracted by UA, such as input services or restaurants). These are all indirect benefit of urban Agriculture.
- Urban agriculture also plays a role in environmental conservation, since energy can be saved by shortening the distance between the points of production and consumption and by reducing savings in storage and transport. Urban agriculture so contributes directly to improve the urban environment (or city ecology) by improving the micro-climate, CO₂ balance and biodiversity within cities, by preventing erosion and flooding through planting bare lands and steep slopes (disaster mitigation) and by using urban (organic) wastes (solid waste and waste water) as a productive resource (that is fertilizer and biogas production).
- Urban Agriculture aids in the prevention of heat island effect. During summer's hottest day, the last place where people usually want to be is in a city-centre, surrounded by buildings, cars and grey sidewalks. The reason for it is simple: cities tend to have an average temperature of 5 to 10 degrees Celsius above that of outlying regions. This phenomenon is called "heat island" and is caused by the high concentration of built-up areas in cities such as rooftops and parking lots, which absorb and re-emit the sun's heat. In contrast with urban environments, natural bodies such as forests and gardens produce freshness while improving air quality. Planting vegetables on rooftops is an efficient way to address the heat island effect, absorb carbon dioxide and have greener cities.

- Urban agriculture also aids in the reduction of greenhouses gases. By promoting a more local production of the food we eat, urban farming can contribute greatly to the reduction of greenhouse gases. Indeed, a large part of the fruits and vegetables we consume has to travel long distances before arriving in our plates, which induce great amounts of pollution. By growing vegetables directly in cities, the distance between production and consumers is reduced and thus diminishes the greenhouses gas emitted through the transportation of food. Moreover, like their green fellows, vegetable plants act as air filters and sequester carbon and other polluting gases, which contributes to the improvement of ambient air in cities.
- Urban agriculture has led to the preservation of biodiversity. The multiplication of urban agriculture zones favours the preservation of biodiversity in cities. As a place to eat and live, these initiatives contribute to the diversification of living organisms in the urban environment. The establishment of several varieties of fruits, vegetables, fine herbs and edible flowers in the vegetable garden encourages the support of these insects and organisms which are essential to life. Cultivating in cities is a concrete action that supports both the fauna and flora of urban centres, while contributing to the development of rich and diversified ecosystems.
- Urban Agriculture has led to added value to properties, integrating urban farming to an existing building creates value. Once unused or underutilized areas, these rooftops, terraces, and ground spaces now have the opportunity to become green oasis, where fresh and healthy food grows (Ali M, & Porciuncula P (1999). In addition to positioning institutions as innovative and sustainable, urban agriculture initiatives benefit not only the occupants of these buildings, but the whole society.

Some Negative Effects of Urban Agriculture

There are problems associated with urban agriculture which can pose risks to public health and the environment most of which stems from the improper management of their waste and improper management of their activities. These problems include the following:

➤ Water Pollution

These arise from the inappropriate or excessive use of agricultural inputs including pesticides, nitrogen, and raw organic matter containing heavy metal residues which may leach or runoff into drinking water sources, microbial contamination of soil and water. A great number and non-standard amount of chemical fertilizers and pesticides are used in agriculture; local water resources may be polluted. Also, overuse of nitrate rich fertilizers of hen or pig can lead to underground waters pollution. Particularly, discharge of compact poultry farms wastes can pollutes drinking waters through transporting micro-organism heavy loads to their sources. Pollution of water may lead to waterborne diseases. Chemical and bacterial contamination of the water sources may lead to severe diseases such as cholera, amoebic dysentery, schistosomiasis, and salmonella.

➤ Air Pollution

The pesticides that may be used in urban agriculture may cause air pollution which is a severe threat to cities with dense populations, as the pollutants may travel far and fast in the atmosphere

potentially harming majority of populations, for example poultry farming can cause the release of offensive odour into the environment, thereby reducing the quality of air and contaminating the air making the environment uncondusive for human habitation (Ayanwale et al., 1982). This may lead to various allergic reactions, respiratory illness, cancers, and congenital birth defect, but these can be mitigated if the wastes are being handled properly and disposed of efficiently, it is highly essential that the amount of pesticides and other aerosol chemicals used in urban agriculture is limited and well-regulated by the local authorities

➤ Contamination of Foods

food may also become contaminated due to poor hygiene in urban cities, leafy vegetables can be contaminated through overuse of chemical sprays, while zoonotic diseases and veterinary public health problems can arise from intensive livestock production (Ayanwale et al., 1982).

➤ It Can Attract Dangerous Reptiles into The Environment

Urban Agriculture practiced in small scale within the residential environment can attract reptiles such as snakes, alligators, monitoring lizards and the rest into the environment. These reptiles are dangerous to humans as they are poisonous and can lead to death if persons. If the production system of Agriculture is properly managed by constant fumigation, weeding and making the areas clean, these dangerous reptiles can be avoided and stopped from entering the urban environment.

➤ Water Shortage

Urban agriculture can create water shortages if the water supply is being shared. Overuse of the public water supply of the city for farming can lead to water shortages, which may be extreme in places with a dense population. Some cities have tried to tackle this issue by using wastewater which is treated for irrigation (Primary treatment of Wastewater). Low-cost high-efficiency water technologies can increase water efficiency and may allow the use of low quality water resources.

Conclusion

The studied discovered positive effects of urban agriculture, although there are few negative effects however, Urban sustainable development needs to establish rotary or continuous and highly efficient systems in cities to make the best use of resources and surface (Drescher A, Iaquina D (1999). Such activity is able to decrease the distance between the place of supplying resources and demand place. Sustainability creates the necessity of establishing the concept of neighbourhood in order to increase the efficiency of urban consumption patterns. Accordingly, agriculture in city and around city can contribute to decrease urban poverty and hunger. The study therefore recommends the integration of urban agriculture into the land use planning while measures to ameliorate the negative effects are put in place for achieve urban sustainability.

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