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Food Security and Challenges of Urban Agriculture in the Third World Countries

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1. Introduction

Interest in food security has been very strong most especially, since the world food crisis of 1972-1974 (Ajibola, 2000, Muhammad-Lawal and Omotesho, 2006).The issue of food and nutritional development in the Third World countries over the years has also generated a lot of concerns and interests among the social scientists, researchers and both governmental and Non Governmental Organizations. This came out of identified incessant problems within the agricultural sector coupled with the dwindling resources and poverty levels among these countries. In many African countries, food insecurity is on the increase with the share that purchased food takes of the household budgets especially in the urban centers.This has also led to increase in the proportion of urban farmers. This increase in the number of urban farmers is in a way affecting positively food security in our urban environment.

Sawio (1993) indicated that urban populations worldwide are growing fast as a result of natural growth and rapid migration to the cities as people escape rural poverty, land degradation, famine, war, and landlessness. Feeding urban population adequately is a major problem in developing countries. Rural areas could no longer produce enough food to feed both rural and urban people and food importation is constrained by lack of sufficient foreign exchange. Countries like Zimbabwe, Kenya, Nigeria, Malaysia, Sri Lanka, Pakistan and Columbia spent a large proportion of their resources to develop agriculture as it is a very important contributor to their Gross Domestic Product, foreign exchange earner and a major employer of labour. The aim of this chapter is two folds. Firstly, to examine the issue of food security as it affects the rapidly growing third world countries, and secondly, to examine the issue of urban agriculture in these countries as a panacea to solving the emerging food crises and to proffer appropriate solutions to the challenges accruing from this development.

Food Security: Meaning and development. Food security has been recognized as an important goal the world over. This is in view of the resolution of the various world food conference and the establishment of the World Food Council among others (Muhammad-Lawal and Omotesho, 2006:71) The persistent hunger and famine in the developing world means ensuring adequate and nutritious food for the population will continue to be the

principal challenge facing policy makers in many developing countries in the 21st century. As part of the Millennium Development Goals, the world leaders have in different occasions pledged to reduce poverty, hunger and improve accessibility to public goods and services.

Food security has been described as a widely debated and much publicized issue over the years with different authors giving meanings to reflect different purposes and objectives. According to Olayemi, (1998, and Ajibola 2000: 58) food security has individual, household, national as well as international perspectives. Food security is defined as "access by all people at all times to the food required for a healthy life" It addresses the risks of not having access to needed quantities and quality of food (Von Braun et,al 1993). This involves food availability, food accessibility, food utilization and the ability to acquire it. In the same vein, Demery, et al (1993) defined food security as access by all people at all times to enough food for an active, healthy life. Its essential elements are the availability of food and ability to acquire it. Thus, Tunde (2011) opined that food security is an objective of every family and household in the developing world, whether in urban or rural areas. A household is food secured if it can reliably gain access to food of a sufficient quality and quantities that allow all its members to enjoy an active and healthy life.

On the other hand, food security exists when all people at all times have physical and economic access to enough safe nutritious food to meet their dietary needs and food preferences for an active and healthy life style (World Food Summit, 1996). More than this, the availability and the quality of food available as well as its utilization are very essential. Food availability and accessibility are often associated with food production and supply, while utilization has to do with the nutritional aspects of food intake. Furthermore, Chung, et al (1997) adopted a conceptual framework to explain the relationship between the various forms of food security. These include food availability, accessibility and utilization. This framework according to them would help us to identify which food security indicators to tackle in order to bring in, efficient food security in a nation. From the framework, it is evidenced that while food availability is a function of resources utilization and production process, food accessibility relates positively to income and consumption while nutritional development arises from the process of food utilization .In the same vein, the work of Demery, et al, (1993) also showed a link that exists between agricultural Food Policy and food security within a National framework. This involves wholly, a Macro Economic Policy trend that would eventually increase household Income, food consumption and then Nutritional Status of the citizenry. Such policies may include trade, fiscal, monetary and employment policies among others .For the Third world to be food secure, a series of events and strategies would have to be put in place. Such issues include:

a. residents must have food all the year round and in every part of the country,
b. people must have access to a large supply of food and food products either being produced internally or being imported without stress,
c. a large proportion of food production should come from the local content, and,
d. the level of nutritional development would have to be on the increase.

Current evidence in many of the developing countries of the world reveals that apart from being food deficit nations, countries are characterized by escalating food prices, food scarcity, famine and post harvest losses. Many countries indigenes are having poor nutritional development especially those countries that experience incessant famine and

drought. They include countries like Sudan, Ethiopia, Somali and Niger to mention a few from the African continent. This is because, apart from the natural catastrophes they experience, their national aggregate production of food is not balanced since demand can not meet the supply flow. According to Bergman and Renwick (1999) about 14% of the World population is chronically hungry today, with sub Saharan Africa as the most troubled region. Problems encountered in the process of increasing food production include in-efficient application of fertilizers, lack of incentive for many farmers, and problems of land ownership among others. Since Malthus published his theory, the human population has increased from 1 billion in 1804 to almost 7 billion in 2011. The mass starvation he predicted however has not occurred, but a near occurrence is being experienced in several parts of the world, thus making food insecurity a threat that deserves attention.

Food insecurity on the other hand is when livelihood systems (capabilities, assets, quality of life) change or fail to adapt to the challenges and shocks of their external environment. These shocks include sudden price increases and unavailability in food, emanating from environmental, socio-economic and political problems among others. This also means that accessibility to food as well as its availability is affected widely, leading to an extensive low nutritional development and eventually starvation.

2. The emerging food crisis in the third world countries

Over the years, there has been short falls in food productivity and increase in food importation into many of the third world countries. For example in Nigeria (like many other developing countries) agriculture has always been the mainstay and livelihood for millions of people. Before independence in 1960, agriculture was the most important sector of the economy accounting for more than one-half of the annual GDP and for more than three-quarters of export earnings. Following the discovery and production of petroleum, the agriculture sector suffered severe decline. Between the mid 1960s and mid 1980s, Nigeria moved from position of self-sufficiency in basic food stuff to one of heavy dependency on imports.

In most of the developing countries of the world (like Nigeria, Ghana, Zimbabwe, Venezuela, Kenya, and some far east Asian countries) where agriculture has remained a mainstay of the economy, various efforts have been deduced to effect and ensure food security in the last five decades. Extensive areas that were scarcely utilized for farming in the past ages have been opened to productive agriculture by many nations. The United Nations report that between 1980 and 1993 for example, the World cropland area increased by another 3%, this has drastically increased to over 10% by 2009, and not less than 60% of these are found in the developing world. Most of these lands were opened by irrigation. Similarly, many food crops and improved seedlings have been transported to new areas by donor Agencies and Non Governmental Organizations to farming locations in the Third world countries. Apart from these, transportation and storage facilities development are on the increase while a large proportion of these countries have been developing improved land management techniques that would increase food productivities over the years. Large scale commercial farming through Agricultural Development Projects were also established to improve agricultural productivities coasting Billion of Dollars, and agricultural extension

services are on the increase. Bergman and Renwick (1999:291) indicated that from the 1950s, an extensive effort was launched to develop new grain varieties and associated agronomic systems and to establish them in developing countries. It focused on certain crops (rice, wheat) and certain techniques (breeding for response to fertilizer inputs), this focused effort was known as green revolution. These and others were also adopted by various governments of the developing nations. There were other scientific revolutions which are on going in many of the developing nations that would make them self sufficient over the years to come, all things being equal. However, not all these developments have taken place equally everywhere.

Despite all these efforts to improve food productivities by developing countries, a large proportion of them still depend on food importation. For example up to 70% of the world's exportation of rice in 2010 is diverted to the developing Nations. Similarly, as at 1994, out of the ten greatest importers of Rice seven of them are from these developing countries of the world as shown on Table 1. The situation now however is more than doubled.

Exporters		Importers	
Thailand	4,859	Japan	2,536
USA	2,822	Brazil	987
Vietnam	1,970	Indonesia	630
China	1,630	China	517
Pakistan	984	Iran	475
India	891	Saudi Arabia	434
Myanmar	643	South Africa	431
Italy	619	Hong Kong	358
Australia	585	Nigeria	350
Uruguay	408	United Arab Emirates	350

Source : Adapted from Bergman and Renwick (1999)

Table 1. Top Ten Exporters and Importers of Rice (In Thousands of Metric Tons).

Apart from huge deficit between the exportation and importation of food in most of the developing world, there is a wave of emerging food crises around the corner. The amount of nutrients needed per capita in each country varies greatly, despite this, there has been a short fall in food production. The sub Saharan African countries clearly face the greatest problems of over all national food supplies. The United Nations in August 2011 indicated that over 605 of Southern Somali is hungry due to famine and ravaging wars over the years. In rich countries of the developing world (like Nigeria, India, China, Venezuela and Libya) many people are well fed but a large proportion of the people are poor. Most countries here are both importers and exporters of food and a few countries are net exporters of food despite the fact that portions of their own populations are under nourished. This may be because of injustice or strive and political instability as in the case of Sudan, Ethiopia and Somali.

Many reasons have been suggested as being the cause of the short falls and emerging food crises in these countries, they include among others:

i. reduction in food production as a result of rural-urban migration;
ii. the spread of food scarcity as a result of drought in the Sudano-Sahelian locations;
iii. reduction of food production as a result of logistic and transportation problems;
iv. poor accessibility to land and crude occupancy/tenure systems;
v. limited accessibility to capital, finance fertilizer and modern chemicals;
vi. competition from other form of production especially cash crops for export markets;
vii. lack of agricultural extension services, storage facilities, improved seedlings and modernization;
viii. fragmentation of land due to poverty, poor input and subsistence productions;
ix. effects of climate change causing excessive dryness, late onset of rain and flooding in some locations;
x. increase growth rate ,urbanization and rising debt servicing components; and
xi. poor and crude land management systems that progressively reduce fertility and farm output over the years;
xii. incessant famine in and around the desert areas of the world and dry areas especially in Somali and the surrounding vast land areas; and,
xiii. social injustice, poverty, unemployment, strife, wars and political instability.

With these and other problems facing food production in the developing countries, various measures are being taken by various levels of government. This ranges from expanded food policies to various planning options. The issues of women in agriculture and urban agriculture are thus on the increase. Urban agriculture is thus seen as one of the ways of creating food security in some of the developing nations.

3. Urban agriculture and food production

Urban agriculture has been defined by various scholars but the work of Axumite, et,al (1994) indicated that it refers not merely to the growing of food crops and fruit trees but that it also encompasses the raising of animals, poultry, fish, snails, bees, rabbits, guinea pigs, or other stock considered edible locally. In the same vein, Mougeot (1994) stressed that urban agriculture involves the production of food and animal husbandry, both within (intra) and fringing (peri) built up areas. Mougeot (1994…p18) expressed further that informal urban agriculture is one livelihood strategy that the urban poor use in combination with other strategies.

In order to meet a part of the food needs of poor urban dwellers, urban agriculture came into being, especially among the poor nations. Urban Agriculture, defined here as "crop growing and livestock keeping in both intra-urban open spaces and peri-urban areas" is becoming a common phenomena in urban areas in the developing world.(see, for example: Sanyal 1984,Wade 1986, Sawio 1993 and Tunde,2011).Urban agriculture has recently become familiar, almost permanent feature all over tropical Africa and in many developing countries, however, research on this social pattern is limited. Mougeot (1994…p18) expressed further that informal urban agriculture is one livelihood strategy that the urban poor use in combination with other strategies. A review of definitions commissioned by International Development Research Centre (IDRC) led Mougeot (2000) to propose the following:

"Urban agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a cit or a metropolis ,which growsand 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 supplyinghuman material resources, products and services largely to that urban area".

Cai, et al (2004) remarked that the concept of urban Agriculture originated from the United States of America (USA) in 1950s, (although un-documented facts indicated that this form of agriculture originated from Africa) . It refers to agricultural activities in urban and peri urban areas by making use of the land, natural ecology and environmental resources. This is the growing ,processing, and distribution of food and other food products through intensive plant cultivation and animal husbandry in and around the cities.

For the purpose of this review and with our experience in Nigeria, Urban agriculture is any form of economic activities involving food production, farming, marketing and animal husbandry being practiced by the urban residents, within the city, around the city; and on rural land areas surrounding the city, using both human and non human resources that have affiliation with the urban set ups. These include free ranged poultry and animal productions found within and along urban roads as well as small scale and commercial productions in and around the city.

4. Types and structure of urban agriculture

In the course of this investigation, five major types were identified on the basis of location within and around the city areas. These are:

a. Market Gardening

This is practiced for the production of staple foods and perishables. They are found near homes, riverbanks, dumping site and other locations at the outskirt of the town. In Nigeria for example, these are financed through self sponsored irrigation projects in the wet areas and fadama regions along the city ways. These are commonly seen at the low density regions and urban fringes in places like Lagos, Ilorin and Ibadan among others in Nigeria. Some of these examples are also common in Yaoundé, Nairobi and Kampala. The farmers here are usually non indigenes and they produce vegetables like Lettuce, Spinach, Orchards and wine tapping especially in Southern Nigeria. Over 20% of the vegetables produced in urban areas in Nigeria are on these farms, especially along irrigation ponds.

b. Compound and Yard farming

This is commonly found within fenced houses especially in the core areas, newly developed locations, and within residential quarters scattered all over the town. These kinds of farms are not usually large scale and they are often fenced. Farmers here produce mainly perennial crops and grains for local consumption.

c. Subsistence farming on open lands

Urban cultivators and local farmers on surrounding villages land mostly own them. Landowners who have not developed their lands are also involved in these types of farming where most productions are for home consumptions and to supplement income. It was

revealed that about 16% of urban dwellers are involved in Nigeria. This form of farming is mainly found among farmers who produce crops for consumption and for commercial purposes. This is the commonest of agriculture on urban landforms. The major crops involved here are grains, vegetables, tubers, orchards, and fadama farming on irrigated lands.

d. Expanded Commercial farming

These are found at surrounding villages and owned mostly by urban land owners, 'big time farmers' retirees, itinerant farmers and migrants among others. Large hectares of land are managed for fish farming, piggery, cattle rearing grain crops and in some cases mechanization is added. Modern fish farming are done in ponds, corporation fish farms, fishing on main rivers, lakes and pond around the city locations. 4.5% of urban farmers are involved in one form of fish production or the other.

e. Constricted surrounding land farming

These are farmlands in surrounding villages where farmlands have been engulfed by the growing city. The villagers owned and tilled the land for commercial productions. Live stock production is also commonly done here. Livestock production includes commercial poultry farming, local poultry farming, piggery, local animal husbandry, cattle rearing and domestic animal keeping and in addition to urban crop farming, 22% of urban farmers in Nigeria keep poultry for commercial purposes..

From the survey here in Nigeria, about 66% of urban families can survive with self produced food. 32% of them sell some of their products within the urban environment while about 15% women food vendors grow their own vegetables as supplement to other productions. The main urban crop production is done on multiple cropping in which a farmer combines more than one crop at a time. Rain fed cultivation of maize, corn, and tubers has also been found to be common especially on the upland locations. Presently, a farmer may cultivate as large as 1.5 hectare especially on farms found at the outskirt of the town while smaller sized farms are found within the town. Similarly, Fadama cultivation is common throughout the year on locations beside rivers.

5. Significance of urban food production

In a recent work by Tunde (2011:132) on motives of urban women farmers in Kwara State, Nigeria, three main motives of women in urban agriculture were isolated. These are food security, income supplement and accessibility to land. This means that women are involved in urban agriculture in order to boost food security, income generation and as a result of accessibility to land. An earlier work on urban farming in Ilorin, Nigeria (Olawepo, 2008) has also identified the issues of income, employment, food security, leisure and poverty alleviation as the main significant factors in urban agriculture. One of the goals of the study was to understand who was practicing urban agriculture. Table 2 shows the distribution of the occupational structure of the respondents in Ilorin. Three occupational categories dominate farming occupation among the 240 urban farmers. They include the urban permanent cultivators who are full time farmers (39.1%), these people are found mainly at the outskirt of the town and in the new developed areas of the city. The second group is the

Occupation	Total
Fulltime farming	94(39.1%)
Professionals	32 (13.3%)
Trading	28 (11.7%)
Civil Servants	54 (22.5%)
Un-employed	14 (5.8%)
Others	18 (7.5%)
Total	240 (100%)

Source- Local Fieldwork, 2007.

Table 2. Occupational Structures of Urban Farmers in Ilorin.

middle income civil servants and other public officers, about 22.5% falls into this category. These are people who majorly farm to supplement their income, and they are mostly found on open lands, and other un-used lands majorly at the outskirt of the town and the surrounding villages.

The professionals who are usually the artisans ranked third with about 13.3% of them in this category while about 11.7% of them are traders. About 5.8%of the un-employed are also involved in urban agriculture. The occupational categories referred to as others include casual workers and migrants who are just settling down in the last one year and they represent a large number of urban poor. This distribution shows that a large proportion of people add urban farming to their fulltime jobs to supplement income or a source of food security to feed immediate family.

The scarcity of food and unemployment has forced many urban poor into farming-at least to feed themselves and extending sale to the community. It is therefore a source of urban employment. This is true for a large portion of rural residents who migrate to the urban areas in search of employment. Many itinerant farmers are also engaged in farming related jobs in the urban areas. It is also clear that urban agriculture in many locations in developing countries makes a significant contribution to food self-reliance in major cities especially in Africa. Food self-reliance is not self-sufficiency but it can go a long way towards reducing food insecurity of vulnerable groups of people. Urban agriculture also supplements a significant share of cities needs and the quality of food they depend upon.

There are also indications that urban agriculture contributes to producers' well being in several ways, such as nutrition, health, cash saving and income generations Mougeot (1994:8) indicated that self-produced food accounted for as much as 18% of total household consumption in East Jakarta, while Olawepo (2008:294) indicated that this accounted for about 22% of urban local consumption in Ilorin, Nigeria. The percentages are much higher in some African countries. Thus in poorer countries and among the lower income groups, self produce food can cover considerable share of household's total food intake and can save or release larger share of household cash incomes. More and more people in our cities are trying to grow some of the food they need, even if it is not much nationally. Urban food

production worldwide is for consumption and it can increase household income. Large proportion of urban farmers is doing it for commercial purposes while local productions support family expenditures and food security.

Despite the criticisms levied against urban agriculture in various urban centres in Nigeria, there has been a growing awareness on the need to recognize its relevance in contemporary Nigerian environment. It is not a small object that has generated attention especially in Nigeria, where the urge and need to feed 'more mouths' is on the increase. The increase in the area coverage of agricultural lands is a pointer to the fact that more people and migrants to urban centers are probably involved in farming practices as a result of its contribution to food production and income generation in time and space. It is a noticeable fact in Nigeria today that the successive Governments in the last three decades have been encouraging mass involvement in agricultural productions both in Nigeria's rural and urban centers. The introduction of government programmes such as the Green Rrevolution, Operation Feed the Nation (OFN) and better life for rural women among others has further boost the morale of men and women in agricultural practices in different locations, urban centres inclusive. This is noticeable in places like Lagos, Ibadan, Oshogbo, Oyo,Jos, Uyo, Sokoto, Maiduguri and Enugu to mention a few.

6. The challenges of urban agriculture

The problems of urban agriculture are numerous and they vary according to the types of farming or the locations where they are found. A recent study of Urban food production in Ilorin, Nigeria has afforded us the opportunity to share parts of the challenges of Urban Agriculture in developing World. Table 3 shows the list of urban agriculture problems from a recent study in Nigeria. For example, the expanded commercial farming at the surrounding villages face similar problems like those of other farmers in other locations in the state.85% or urban farmers indicated the problem of disturbance on farms from intruders and animals as the main problem. This affects majorly those in close locations to the city. This is so because most of the urban agriculture in developing world are not usually organized, except those owned by corporate organizations and governments. There are however variations from countries to countries. For example, commercial ranching is organized in countries like Kenya, Tanzania, Ethiopia and Zimbabwe. Whereas in a country like Nigeria, organized ranching are few while free ranged animal husbandry is common both within the city and at the outskirt of the city.

This problem was followed by unreliable supply of inputs such as fertilizers, agro-chemicals, and farm extension services. This problem is common among African urban farmers generally as a result of poor accessibility to capital which invariably is a constraint to increased agriculture and urban food production generally. Following closely is insecurity of tenure on farmland especially farmers within developed areas. This problem is on the increase as a result of sustained increase in the economy of most developing countries' urban set up. The rate of urban growth is creating increased demand in land use for both industrial and residential development. More land owners are demanding for their lands even before harvesting periods. Many at times, farmers will forfeit their crops with or without compensation from land owners.

Another important problem ranked high by 65% of farmers at restricting locations and ranked fifth by others is the issue of threat from Government officials especially those in charge of the city beautification. For example in Ilorin, Nigeria this includes the State Waste Management Corporation and Ministry of Land and Housing. This comes in the wake of Government's advocate for environmental protection within the city as 'defacing' the green acres and beauty of the town. Other problems faced in order of their importance include lack of financial support from the government, shortage of water for irrigation, poor yield due to late onset of rain, lack of storage facilities, dwindling price of agricultural products and insufficient time to work on the farm.

Problem	Rank	Remark/Causes
Disturbance from intruders & animals	1	Lack of fence and demarcation
Unreliable supply of inputs	2	Poor attention from government agencies
Insecurity of tenure on lands	3	Continuous development of land
Threat from government agencies	4	Misplaced priority
Poor financial support	5	Poor accessibility to fund
Shortage of water	6	Irrigation problem
Poor yield	7	late onset of rain the previous year
Dwindling price of farm products	8	Glut in the market
Insufficient time to work on the farm	9	Demand from primary occupation

Source: Local Fieldwork, 2007.

Table 3. Major Problems of Urban Agriculture

When asked to suggest the way out of these problems, the major consensus of the farmers is focused extensively on government recognition and provision of extensive farming land outside the main city location. This will boost production and improve food availability in the city. Food security will also be ensured not only in the urban setup, but in the surrounding localities. Various governments in the third world countries should lay emphasis on diversification of their economies. This would reduce dependency on single mode economy which relies mostly on a mineral resource. Apart from this, policies that would increase incomes and food productivity with high proportion of local content should be encouraged. In conclusion, in view of the importance of urban agriculture in the third world as indicated by these findings, urban agriculture should be retained as a part of the

city's economy. This might entail zoning certain areas of the city for specifically agricultural uses (on the green belt model). We can alternatively alter existing bylaws to permit farming in certain parts of our urban cities-most notably in the residential suburbs and the more peri-urban areas. More must also be done to formulate planning policies that will directly increase the chances of the urban poor to enhance their livelihood by supporting urban agriculture, a promising but largely undeveloped sector.

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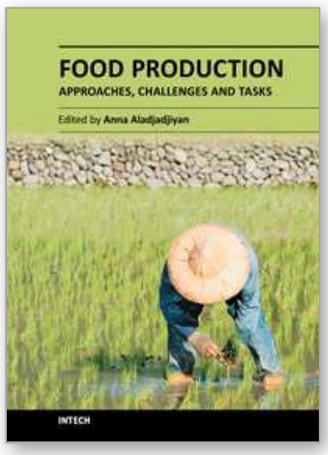

Food Production - Approaches, Challenges and Tasks

Edited by Prof. Anna Aladjadjiyan

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This book is devoted to food production and the problems associated with the satisfaction of food needs in different parts of the world. The emerging food crisis calls for development of sustainable food production, and the quality and safety of the food produced should be guaranteed. The book contains thirteen chapters and is divided into two sections. The first section is related to social issues rising from food insufficiency in the third world countries, and is titled "Sustainable food production: Case studies". The case studies of semi-arid Africa, Caribbean and Jamaica, Burkina Faso, Nigeria, Pacific Islands, Mexico and Brazil are discussed. The second section, titled "Scientific Methods for Improving Food Quality and Safety", covers the methods for control and avoidance of food contaminants. Substitution of chemical treatment with physical, rapid analytical methods for control of contaminants, problems in animal husbandry related to diary production and hormones in food producing animals, approaches and tasks in maize and rice production are in the covered by 6 chapters in this section.

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