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Operational pattern and contribution of urban farming in an emerging megacity: evidence from Lagos, Nigeria

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Abstract. Urban farming is rapidly growing in many cities in Nigeria including a leading African megacity Lagos, although urban stakeholders have paid little attention to the trend over time. The rate of growth of urban farming and its contributions to Lagos state's food supply strategy is worthy of note. In Lagos farming activities are practiced and performed by some able bodied migrants from all parts of the country, who for many reasons could hardly have been absolved by the aggressive urban economy of the city. A close watch on the practitioners reveals a pattern of operation which requires deeper inquiry. A total of 202 urban vegetable farmers were interviewed in four areas of Lagos state to provide primary data for this study. Results from the study showed that an average farmer owns a farm plot of below 120 m by 60 m usually linear and along the expressway, the green vegetable (*Celosia argientes*) alone constitutes about 97% of what is grown, beds are arranged in sizes of about 1.8 m long by 0.9 m wide and 0.3 m high with furrows in between. The farmers use the simplest local tools, chemical fertilizers, and strategically located irrigation wells. It was also found that the farmers use some part of the vegetables for household consumption, sell others to the local marketers, and contribute their own quota to stem the rising prices of vegetable produce in the local markets. It is therefore imperative on the stakeholders to re-examine the relevance of urban farming in the city and provide support for its growth.

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Contents:

1. Introduction

Urban farming is rapidly growing in many cities in Nigeria including a leading megacity Lagos, although urban stakeholders have paid little attention to the trend over time (see Fasona, Adedayo, 2004; Olawepo, 2008). The rate of growth of urban farming and its contributions to the urban centres food supply strategy is worthy of note. Urban agriculture has become very noticeable these days in developing economies perhaps for the role it plays in urban nutrition and employment opportunities (see Averbeke, 2007; Kutiwa et al., 2010; Tefera, 2010). It contributes to food security in several ways. For instance, it increases the amount of food available and enhances the freshness of perishable foods reaching urban consumers. It also offers opportunities for productive employment in the sector with low barriers to entry. Urban farming contributes enormously to the food security of urban households (Kutiwa et al., 2010). Besides these factors, urban farming is a strategy for survival in the city (Hungwe, 2006). Generally, urban agriculture has become a universal trend in all parts of the world and about 800 million urban residents worldwide in income earning are involved (FAO, 1999). Perhaps, all this accounts for the increasing focus of urban researchers on urban farming in Africa over the times (see Zinyama, 1986; Fox, 1988; Saif, 1988; Gbadegesin, 1995; Maxwell, 2000; Kutiwal et al., 2010).

Urban agriculture refers to agricultural practices within and around cities which compete for land, water, energy, and labour resources – that could also satisfy other requirements of the urban population (FAO, 1999). Gbadegesin (1995) however defines urban farming as an agricultural vocation where farmers use small available spaces usually in the suburbs of the city to produce a few crops to sustain their livelihoods. Usually urban agriculture takes place on road setbacks, in backyards, on balconies, verges, vacant plots, in gardens, and even on roof tops (Tefera, 2010). It is generally characterised by a low capital profile, individualistic efforts, fragmented land holdings, and subsistence operations. It involves the growing of food crops such as cassava, vegetables such as amaranthus species (*Celosia argientes*), aquaculture, livestock such as poultry and pigs. Among the varying urban agricultural crops, vegetables are the most visible and their production has expanded in and around cities in many developing countries (see Fasona, Adedayo, 2004; Averbeke, 2007). The broad diversity of horticultural crop species allows year-round production, employment and income. Vegetable growers have realised that intensive production can be practised on small plots, making efficient use of limited water and land resources. Vegetable species have considerable yield potential and can provide up to 50 kg of fresh produce per square metre per year (FAO, 1999). In addition, due to their short production cycle they provide a quick response to emergency food needs. Leafy vegetables provide a quick return that helps families meet their daily cash requirements for purchasing food. Urban vegetable production has another advantage: leafy vegetables are particularly perishable and post-harvest losses can be reduced significantly when the farm is located close to consumers.

However, there are several challenges that urban farmers are encountering in the present dispensation where economies are in a dire condition. One of these challenges is the limitations faced by farmers regarding the available operational tools. Urban farmers often use small operational tools such as hoes, cutlasses, hand sprinklers, low-input processing, and storage techniques. Second, for market sales – including street food, there are limits to the quantities that can be produced and delivered without infrastructure for transportation, storage refrigerators, distributing, and marketing facilities. Support for advanced production implements, transport infrastructure, sufficient lands, storage, and refrigeration facilities could raise the income potential of urban farmers, and improve the safety of food sold by street vendors who rely heavily on urban and peri-urban food production. Other challenges facing urban agriculture include lack of land, poor capital base and insecurity. The few research endeavors that have been conducted in Nigerian cities for example Gbadegesin (1995), Fasona and Adedayo (2004) and Olawepo (2008), examined urban agriculture in the context of diverse agricultural produce such as animal rearing and backyard gardening. None of these works ever emphasised the operational pattern of urban agriculture in Lagos megacity. The idea of megacity is a creation of the United Nations whose purpose is to identify

specifically challenges of rapidly growing cities of the world that are about 10 million population and ensure their sustainability developmentally. In Africa two cities have been conferred with the megacity status and these are Cairo in Egypt and Lagos in Nigeria (UNHABITAT, 2008). Part of the challenges facing the African emerging megacities is inadequate nutrition and it is no more surprising that urban farming has evolved to fill the gap in the food supply equation in the cities. In this paper we therefore take a look at urban vegetable farming from the perspectives of its spatial pattern and contributions to the urban economy of Lagos. Specifically the objectives are as follows: (a) to examine the attributes of urban farmers in Lagos; (b) to analyse urban farming operations; (c) to examine urban farming contributions to the urban economy and household food security; (d) to analyse urban farming challenges, (e) to proffer some policy suggestions on how to mitigate the challenges of urban farmers. The study consists of the following parts: introduction, study area, methodology, results and discussion, conclusion, and policy suggestions.

2. Study area

This study was conducted in four areas of Lagos metropolis: Lasu-Iba, Iyana-Ishasi, Abule-Ado, and the Lekki-Epe roads. Located at the southwestern part of Nigeria, Lagos is geographically positioned on longitude 2°42'–4°20' East and latitude 6°22'–6°42' North. It is bounded on the West by the Republic of Benin, in the North and East by Ogun State and in the South by the Atlantic Ocean. With a population of over 10 million people (NPC, 2007) Lagos metropolitan area is the most rapidly growing region in Nigeria and the second African megacity. Lagos State is a littoral state endowed with riverine regions and wet humid climate. The mean rainfall is about 1,532 mm with double peak regimes in July and October, average daily temperature is about 27°C and the vegetation is luxuriant with mangrove and tropical swamp forests (Odumosu et al., 1999). Naturally, this climatic condition favours the growth of tropical plants and crops such as cassava, vegetables and maize. Lagos soil which is largely sandy weathered rock on the coastal fringe and reddish clay on the northern fringe supports the growth of vegetables and cassava. However, Lagos metropolis has lost a greater part of its vegetative cover due to industrialisation and urbanisation. The economic activities that dominate this region are largely secondary and tertiary and less farming is practised in the state. Twenty Local Government Areas LGAs and thirty-seven Local Council Development Authorities make the present Lagos state. LASU-Iba and Iyana-Ishasi are located in Ojo LGA, Abule-Ado in Amuwo Odofin LGA and the Lekki-Epe roads in Ibeju-Lekki LGA.

3. Material and research methods

Data and methods of data collection: Data for this study were collected from field surveys conducted between September and December, 2010 in four locations in Lagos: LASU-Iba, Iyana-Ishasi, Abule-Ado, and the Lekki-Epe roads, all in the suburb areas of Lagos. A total of 250 farmers were intended to be sampled using structured questionnaires but we were only able to process 202 questionnaires during analysis. 48 questionnaires were voided based on incomplete information. The questionnaire was compartmentalised into four sections depending on the objectives of the study. These sections are farming operations, farming benefits, farming challenges, and farmers attributes. We employed non-random sampling to select the four areas based upon the locations and quota sampling technique to pick the farmers during the survey. The locations were identified prior to the commencement of the survey and an attempt was made to interview any available farmers we could sight. This method was adopted because of the fragmented nature of vegetable farms in Lagos.

Measures of variables: Based upon previous studies for example Olawepo (2008) and Kutiwa et al. (2010), a number of variables were operationalised to perform empirical analysis on the pattern of urban farming operation in Lagos. For purposes of articulation and concision the variables employed in the study are categorised into four: (a) farm operation variables: there are six variables raised to represent farm operation and these are, farm size, maturation period, source of seedlings, storage facility, time devoted, and cost of production; (b) farm benefit variables: there are three variables raised to describe farmers' benefits from farming and these are source of employment, earnings from sales and household consumption; (c) urban farming challenge variables: three variables were employed to describe urban farming challenges in Lagos and these are lack access to lands, financial assistance, and length of tenure; (d) urban farmer attribute variables: seven variables were used to describe the farmers and these are gender, age, marital status, education, religion, ethnic origin, and place of residence in Lagos. In total the number of variables used in this study is nineteen.

Analytical methods: Two analytical statistics were employed to summarise and make inferences in this study. First, we used the univariate descriptive statistics involving cross tabulation and percentages to summarise the collected data. Second, we employed inferential statistics of Pearson Chi-square techniques to determine the significance of the differences between data distribution.

4. Research results and discussions

4.1. The nature and attributes of urban farmers in Lagos

The characteristics of farmers interviewed in this study as contained in Table 1 include gender, age, marital status, educational level, religion, ethnicity, and place of residence. According to gender, 88.6% of the farmers are males and 11.5% are females. This shows that the majority of urban farmers are males as against few females who make their living through farming. Regarding age groups, over half of urban farmers in Lagos are between ages 31 and 40, 33.7% are between 20 and 30 years old. The majority of the farmers are mature young people in contrast to small proportions that are old. Based on marital status 66.8% of the farmers are married, compared to 28.7% that are single, 1.5% widowed and 3.0% divorced. The educational level of famers varies with about 74% having primary school certificate or being illiterates, while 22.8% have secondary education and a negligible proportion of 1.5% are graduates. With regard to religious persuasions, over 76% of the farmers are Muslims, 22.3% are Christians and 1.5% of them are neither Muslims nor Christians.

Table 1. Characteristics of urban farmers in Lagos

Attributes	A	B	C	D	E
Gender:					
Male	179 (88.6)	43 (21.3)	38 (18.8)	46 (22.8)	52 (25.7)
Female	23 (11.4)	4 (2.0)	6 (3.0)	4 (2.0)	9 (4.5)
Age:					
20–30 years	68 (33.7)	23 (11.4)	17 (8.4)	14 (6.9)	14 (6.9)
31–40 years	116 (57.4)	22 (10.9)	19 (9.4)	34 (16.8)	41 (20.3)
41-above	18 (8.9)	2 (1.0)	8 (4.0)	2 (1.0)	6 (3.0)
Marital:					
Single	58 (28.7)	14 (6.9)	21 (10.4)	7 (3.5)	7 (3.5)
Married	135 (66.8)	33 (16.3)	18 (8.9)	42 (20.8)	42 (20.8)
Widowed	3 (1.5)	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)
Divorced	6 (3.0)	0 (0.0)	4 (2.0)	1 (0.5)	1 (0.5)
Education:					
Illiterate	48 (23.8)	9 (4.5)	9 (4.5)	18 (8.9)	12 (5.9)
Primary	101 (50.0)	30 (14.9)	21 (10.4)	26 (12.9)	24 (11.9)
Secondary	46 (22.8)	7 (3.5)	12 (5.9)	6 (3.0)	21 (10.4)
Graduate	3 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)	3 (1.5)
Others	4 (2.0)	1 (0.5)	2 (1.0)	0 (0.0)	1 (0.5)
Religion:					
Christianity	45 (22.3)	7 (3.5)	11 (5.4)	10 (5.0)	17 (8.4)
Islam	154 (76.2)	40 (20.3)	31 (15.3)	39 (19.3)	44 (21.8)
Others	3 (1.5)	0 (0.0)	2 (1.0)	1 (0.5)	0 (0.0)
Ethnic origin:					
Lagos	14 (6.9)	0 0.0)	1 (0.5)	0 (0.0)	13 (6.4)
North	140 (69.3)	42 (21.3)	30 (14.9)	41 (20.3)	27 (13.4)
South east	32 (15.8)	5 (2.5)	7 (3.5)	8 (4.0)	12 (5.9)
South west	16 (7.9)	0 (0.0)	6 (3.0)	1 (0.5)	9 (4.5)
Place of residence:					
Core metropolis	21 (10.4)	0 (0.0)	1 (0.5)	0 (0.0)	20 (9.9)
Far metropolis	31 (15.3)	7 (3.5)	10 (5.0)	3 (1.5)	11 (5.4)
Suburbs	150 (74.3)	40 (20.3)	33 (16.3)	47 (23.3)	30 (14.9)
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010. Values in parentheses are percentages

The preponderance in religious adherence of the farmers towards a Muslim majority finds an explanation in the spatial pattern of the ethnic distribution of farmers, the majority (69.3%) of whom are from the Northern region of the country, followed by 15.8% from the South Eastern region and 7.9% from the South Western region. Farmers of Lagos origin are 6.9% of the whole sample population. What this goes to show is that urban farming is majorly practised in Lagos by migrants, the majority of whom are of Northern stock. Lastly, on the issue of where the farmers live, it is discovered that a vast majority of them, 74.3% actually live in the suburb areas of Lagos very close to where they engage in their farming activities. Only 10.4% live in the City Core and 15.3% live in the Far Metropolis. In summary, and in line with previous observations by Fasona and Adedayo (2004), the background analysis of urban farmers in Lagos has revealed the facts that the majority of them are young, majorly male, less educated, Muslims of Northern origin. Unlike what obtains in less urbanised regions of Nigeria (see Olawepo, 2008), the urban farmers in Lagos are majorly unemployed, mature individuals who find solace in tendering vegetables along city road setbacks and open spaces. Perhaps, these farmers are migrants who are forced to take to this vocation for reasons of pure survival, since they could not easily find white collar jobs in the metropolis and are not entitled to land by inheritance.

4.2. Nature of urban farming operations in Lagos

The nature and patterns of urban farming in Lagos can be analysed through many dimensions. In this study we have approached urban farming operations through farm sizes, nature of the vegetables, maturation period, source of seedlings, storage of produce, time devoted to farming daily and cost of production. In terms of distribution of farm sizes, analysis reveals that the majority of the farmers that is 81.6% operate on a farm plot area of less than 120 m by 60 m (less than 7,200 m^2), 15.4% operate on a farm plot area of 120 m by 60 m (7,200m^2) and 1.7% operate on a plot area of above 7,200m^2 (see Table 2). Variation among the location is significant with χ^2 value of 15.354 being significant at 95% but not at 99.9% confidence levels. The implication of this is that farm area of land per person is too small and can hardly allow large scale production. Even though, the farmers are merely subsistence, there is a need to have more access to land than what is presently the case in the state.

Another area of focus as regards operations is the source of seed available to the farmers. Since, we are considering vegetable farming alone the sources of seeds are categorised into three: government ministry of agriculture, self provided and from other farmers. As can be seen from Table 3, it would be noted that the ministry plays little role in seedling procurement for the farmers. 89.1% of the farmers actually get initial seeds from either themselves or from other farmer friends. The variation in data is significant with χ^2 value of 44.952 being significant at 99.9%. As for the maturation period for the vegetables being cultivated, information from Table 4 shows that the majority of the farmers harvest their produce between 4 and 6 weeks after sowing, while only 19.3% harvest their vegetable produce between 8 and 10 weeks. Perhaps the second group is reacting to the harvesting period of the dry season. Depending on the varieties of vegetable being cultivated the most probable periods for harvesting vegetables should be between 6 and 8 weeks. There is a consistent variation in the distribution with χ^2 value of 100.685 being significant at 99.9% level of confidence. The amount of time devoted to farming by the farmers serves to inform of the exigency of the vocation to them. According to information emanating from Table 5, the majority of the farmers 51.6% use the whole day on the farm, followed by 40.6% that use between 5 hours and 8 hours and 7.9% that use between 1 hour and 4 hours on farming activities daily. The χ^2 value of 59.996 is significant at 99.9% confidence levels, showing that there is inter location variation in the time devoted to farming by the farmers.

Table 2. Farm size distribution

Farm size	A	B	C	D	E	CHI-SQUARE X^2
Less than 120mx60m	163 (80.7)	37 (18.3)	31 (15.3)	49 (24.3)	46 (22.8)	15.354
120mx60m	32 (15.8)	9 (4.5)	11 (5.4)	1 (0.5)	11 (5.4)	P=0.018 at 95%
120mx60m and more	7 (3.5)	1 (0.5)	2 (1.0)	0 (0.0)	4 (2.0)	
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

Table 3. Seedling procurement by farmers

Source of seedlings	A	B	C	D	E	CHI-SQUARE X^2
Lagos ministry	24 (11.9)	11 (5.4)	2 (1.0)	5 (2.5)	6 (3.0)	44.952
From others	82 (40.6)	30 (14.9)	14 (6.9)	26 (12.9)	12 (5.9)	P=0.000 at 99.9%
Self provided	96 (47.6)	6 (3.0)	28 (13.9)	19 (9.4)	43 (21.3)	
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

Table 4. Farm produce maturation period

Crop Duration	A	B	C	D	E	CHI-SQUARE X^2
4–6weeks	163 (80.7)	47 (23.3)	26 (12.9)	50 (24.8)	40 (19.8)	100.685
8–10 weeks	39 (19.3)	0 (0.0)	18 (8.9)	0 (0.0)	21 (10.4)	P=0.000 at 99.9%
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

Table 5. Duration of time engaged in urban farming

Time used daily	A	B	C	D	E	CHI-SQUARE X^2
1–4 hrs	16 (7.9)	0 (0.0)	11 (5.4)	0 (0.0)	5 (2.5)	59.996
5–8 hrs	82 (40.6)	18 (8.9)	23 (11.4)	7 (3.5)	34 (16.8)	P=0.000 at 99.9%
Whole day	104 (51.5)	29 (14.4)	10 (5.0)	43 (21.3)	22 (10.9)	
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Filed Survey, 2010

An important part of the farm operations is the possession of storage facilities which can be used to preserve and store excess produce against damage and destruction. Storage facilities especially fridges and freezers are essential in achieving the goal of averting damage. Usually, the farm produce has a short life span after harvest and if unpreserved may be destroyed by heat, sun and rodents. Given the usefulness of storage facilities to farm operation we sampled the number of farmers that actually have any storage facilities and the results are presented in Table 6. From the information in Table 6, a vast majority 86.4% does not have any form of storage and only 13.4% claim to possess some kinds of storage facility and the χ^2 value of 17.862 is significant at 99.9% confidence levels. The simple implication of this is that the excess produce from the farming activities are unsafe and can be wasted before reaching and after leaving the market.

The last aspect of farm operation is the cost incurred on preparation, fertilizers, seedlings, equipment and labour. In the study we estimate production

Table 6. Possession of storage facility by farmers

Storage	A	B	C	D	E	CHI-SQUARE X^2
Yes	27 (13.4)	3 (1.5)	10 (5.0)	0 (0.0)	14 (6.9)	17.862
No	175 (86.4)	44 (21.8)	34 (16.8)	50 (24.8)	47 (23.3)	P=0.000 at 99.9%
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

Table 7. Farm operational cost

Cost	A	B	C	D	E	CHI-SQUARE X^2
10% of sales	57 (28.2)	10 (5.0)	8 (4.0)	18 (8.9)	21 (10.4)	17.661
20% of sales	135 (66.8)	37 (18.3)	33 (16.3)	32 (15.8)	33 (16.3)	P=0.007 at 99%
40% of sales	10 (5.0)	0 (0.0)	3 (1.5)	0 (0.0)	7 (3.5)	
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

cost as a fraction of sales and invite respective farmers to indicate which applies to him or her. Table 7 contains information on the cost of production by urban farmers in different locations in Lagos. From the analysis, it is obvious that the majority of the farmers representing 66.8% spend 20% of their earnings on production and 28.2% spend 10% of their sales on the required farming inputs. Both 20% and 40% expenditures on farm input are rather on the high side and can whittle down the resultant profit margin of farmers in the long run. Inter location variation is significant as depicted by the χ^2 value of 17.661 at 99.9% confidence levels.

4.3. Contributions of urban farming to urban economy and food security

Urban farming contributions to the economy of the city can be explained in three ways: it provides both part-time and full time employment for a group of urban residents who are majorly migrants and are prepared to farm to survive, it provides a source of food for the farming households thereby alleviating the incidence of food insecurity in the city, and it provides cash for the households engaging in subsistence vegetable farming in the state thereby improving the financial situations of the poor. In our analysis of the contributions of vegetable growing in Lagos to the economy we discovered that 77.2% of the respondents interviewed take the tendering of vegetables as a full time job and 22.8% as a part-time vocation. As can be gleaned from Table 8, this trend is consistent in all the locations where urban farming is popularly practised and the χ^2 value of 13.325 is significant at 99.9% confidence levels. Besides employment provision, urban farming also provides a major source of income to the practitioners as can be seen from the earnings from sales of vegetables as presented in Table 9. Using information from Table 9, it can be observed that 63.9% of the farmers earn between NGN 11,000 and NGN

Table 8. Urban farming as an employment opportunity

Form of employment	A	B	C	D	E	CHI-SQUARE X^2
Part-time	46 (22.8)	3 (1.5)	10 (5.0)	11 (5.4)	22 (10.9)	13.325
Full time	156 (77.2)	44 (21.8)	34 (16.8)	39 (19.3)	39 (19.3)	P=0.004 at 99.9%
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

Table 9. Earnings from sales of farm produce

Earnings from Sales in NAIRA (NGN)	A	B	C	D	E	CHI-SQUARE X^2
5,000–10,000	47 (23.3)	15 (7.4)	21 (10.4)	0 (0.0)	11 (5.4)	
11,000–15,000	129 (63.9)	32 (15.8)	12 (5.9)	47 (23.3)	38 (18.8)	64.619
16,000–20,000	17 (8.4)	0 (0.0)	9 (4.5)	3 (1.5)	5 (2.5)	P=0.000 at 99.9%
21,000 above	9 (4.5)	0 (0.0)	2 (1.0)	0 (0)	7 (3.5)	
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

Table 10. Consumption of part of produce by farmers' households

Household consumption	A	B	C	D	E	CHI-SQUARE X^2
Yes	141 (69.8)	33 (16.3)	20 (9.9)	45 (22.3)	43 (23.3)	17.862
No	61 (30.2)	14 (6.9)	24 (11.9)	5 (2.5)	18 (8.9)	P=0.000 at 99.9%
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

15,000 and about 13.0% made above NGN 15,000 from their sales of vegetables, through market sales. Depending on the number of times this produce is ready for market, there is perhaps a greater possibility that urban farmers can augment their daily expenditures through vegetable growing. A disaggregated analysis of the opportunity to make money through sales of produce using χ^2 value of 64.619, which is highly significant at 99.9%, shows that in all the locations farmers are very likely to benefit more through the growing of vegetables in Lagos.

An important aspect of the contribution of urban farming to the urban economy in Lagos is perhaps the reduction in household food insecurity occasioned by the consumption of some of the produce being generated by the farmers themselves. Analysis of how urban farming could aid food security through consumption of self produced vegetables showed that nearly 70% of the farmers consume some of their vegetables at household level (see Table 10). Invariably, this will reduce the problem of food shortage to the households involving in farming in the state. An examination of the spatial patterns of this event reveals that there is significant difference among the locations as depicted by χ^2 value of 17.862 which is significant at 99.9%. All observations made about urban farming contributions to food security and employment find further support in previous research (see Averbeke, 2007; Olawepo, 2008; Tefera, 2010).

4.4. Challenges that are confronting urban farmers

In spite of the visible contributions that urban farming is making in Lagos, the farmers are faced with immense challenges which can be summarised as lack of accessibility to funds and adequate land for farming activities. As regards accessibility to funds, from our analysis as presented in Table 11, we

Table 11. Lack of financial assistance

Financial assistance	A	B	C	D	E	CHI-SQUARE X^2
Yes	17 (8.4)	0 (0.0)	5 (2.5)	1 (0.5)	11 (5.4)	14.805
No	185 (91.6)	47 (23.3)	39 (19.3)	49 (24.3)	50 (24.8)	P=0.002 at 99.9%
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

Table 12. Accessibility to farm lands

Land ownership	A	B	C	D	E	CHI-SQUARE X^2
Owner	9 (4.5)	0 (0.0)	3 (1.5)	0 (0.0)	6 (3.0)	41.097
lease	54 (26.7)	9 (4.5)	15 (7.4)	2 (1.0)	28 (13.9)	P=0.000 at 99.9%
squatting	139 (68.8)	38 (18.8)	26 (12.9)	48 (23.4)	27 (13.4)	
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

discovered that 91.6% of the respondents deny having any financial assistance from the governments-local, state or federal while only 8.4% maintain that they have received a sort of assistance from the government. There is a significant difference among the responses as shown by χ^2 value of 14.805 which is significant at 99.9% confidence levels. Another serious challenge facing urban farmers in Lagos is lack of accessibility to adequate land for farming purposes. Table 12 contains information about land ownership that characterises urban farming tenure in the state: owner, lease and squatting. Among the three ownership possibilities squatting accounts for 68.8% while lease accounts for 26.7%. Of course, farm land personally owned by farmers, accounts for barely 4.5%. In all the locations, there is a significant difference in the status of land holding as χ^2 value of 41.097 is significant at 99.9%. The implication of these results is that land for farming purposes is highly difficult to procure by the urban farmers in Lagos. From the field observation it is noticed that farmers actually make use of marginal lands that are owned by the federal government and abut the major transport arteries in all the locations.

Having established the fact that the majority of the farmers are squatters we investigate their length of stay on the farm plots on which they perform their farming operations. Investigation reveals that about 74.2% of them have been using the plots between 1 year and 10 years while only 3.5% have used the same plots for 21 years and above (see Table 13). The inter location variation is only significant at 95% but not at 99.9% confidence levels with χ^2 value of 17.819. The outcomes of this inquiry tally with the findings from previous studies in Bulawayo and Gweru by Hungwe (2006) and in Harare by Kutiwa et al. (2010).

As a form of summary, it is evident that urban farmers in Lagos are facing stringent challenges that are far beyond their capacity. The weakness of Decree 1978 Land Use policy has compounded their accessibility to land for farming in the rapidly growing megacity of Lagos. And their financial handicaps place a serious limitation on their ability to purchase land for urban farming (Fasona, Adedayo, 2004). The competing influence of housing and industrialisation in Lagos is one force that has crippled the capacity of urban farming to thrive since the two urban activities are more profitable to the investors than farming. The order of these challenges was also investigated and this information is contained in Table 14.

Evidently as indicated in Table 14, land, fund and insecurity are the three most pressing difficulties facing urban farming in Lagos. Flooding, water supply,

Table 13. Length of stay on farm land

Length	A	B	C	D	E	CHI-SQUARE X^2
1–5 yrs	31 (15.3)	8 (4.0)	4 (2.0)	11 (5.4)	8 (4.0)	17.819
6–10 yrs	119 (58.9)	26 (12.9)	30 (14.9)	32 (15.8)	31 (15.3)	P=0.037 at 95%
11–20 yrs	45 (22.3)	13 (6.4)	9 (4.5)	7 (3.5)	16 (7.9)	
21 yrs and above	7 (3.5)	0 (0.0)	1 (0.5)	0 (0.0)	6 (3.0)	
Total	202 (100)	47 (23.3)	44 (21.8)	50 (24.8)	61 (30.2)	

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

Table 14. Areas where farmers are encountering hardship

Area of difficulties	A	B	C	D	E	RANK
Fertilizers	57.5	12.9	15.8	14.9	15.3	4th
Land	89.9	21.2	25.4	23.2	20.1	**1st**
Fund	85.9	20.5	20.2	22.2	23.0	**2nd**
Water	4.0	1.0	0.0	1.0	2.0	7th
Pest control	47.6	11.6	12.5	12.6	11.9	6th
Flooding	48.8	9.4	10.0	10.9	18.5	5th
Insecurity	75.8	23.5	20.3	20.0	12.0	**3rd**

Explanation: A – all sample; B – Lasu-Iba; C – Iyana-Ishasi; D – Abule-Ado; E – Lekki-Epe

Source: Authors' Field Survey, 2010

pest control and fertilizers seem to be of less concern to the urban farmers than the three major problems. The results are comparable with the conclusions arrived at by previous studies (see Olawepo, 2008; Kutiwa et al., 2010; Tefera, 2010).

5. Conclusions and policy suggestions

From empirical analyses done in this study and facts that have been revealed, it is obvious that urban farming is practised widely in Lagos and has some benefits and of course some challenges. In terms of the spatial pattern of operation, findings have shown that vegetable farming is practised more in the suburbs perhaps for lack of space in the inner core of the city. In the context of benefits to urban residents, it is apparent that beside being source of employment to otherwise idle hands, urban farming also provides food for urban households and some income to the poor migrants that live in the suburbs of Lagos. However urban farmers in Lagos face some constraints which hinder their productivity. The challenges facing urban farmers include lack of access to land, insecurity of land tenure, insufficient funds, and inaccessibility to cheap fertilizers and a little extent flooding. Some of these problems facing urban farmers have something to do with lack of formal recognition of urban farming by the urban stakeholders (see Olawepo, 2008). The findings from this study have serious policy implications for urban sustainability. Much as the city enjoys population explosion (Lagos is a megacity), the future population trend is unpredictable and no evidence to suggest a decline in in-migration into the city in near future. The changing nature of Lagos megacity does not give promise in support of migrants that are either totally unskilled or partially literate. The rural migrants with all the trappings of rurality would continue to have challenges with job location in the city and the only avenue to have something doing for themselves is through small scale farming around the city fringes. It is our suggestion in this paper that urban policy should begin to address the issue of urban farming more seriously. Government should endeavor to encourage urban farmers by assisting them in the areas of funding, provision of cheap fertilizers, special provision for agricultural land zones, and perhaps technical support to assist them in the area of flood water control. In terms of policy, government should find a way of incorporating urban agriculture into the larger agricultural policy framework in the country. The idea of looking at agriculture as an exclusively rural activity should be revisited and a proper integration of the urban farming sector into the urban economy is highly advocated. Increasing trend of urban agriculture in Africa and indeed Nigeria today is a reflection of ruralisation of the urban space. Since the practice of urban farming is generally by the rural migrants as empirically shown in this study, the new wave of urban agriculture in Lagos is a manifestation of urban ruralisation.

Notes

(1) A version of this paper was presented at the 52nd Annual Conference of the Association of Nigerian Geographers, held at the Uthman Danfodiyo University, Sokoto from February 14–18th 2011.

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