Original Research Article

Dimensions and Constraints Associated with Urban Farming in Edo State, Nigeria

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Abstract

This study investigated the dimensions of urban farmers in Edo State including the constraints that characterize this farming system. It profiled the farmers' socio-economic characteristics, examined the dimension/types of urban agricultural activities carried out and identified important constraints faced by the farmers. Data were collected from 124 urban farmers sampled from the three major towns in each of the three senatorial zones of the State. The data were analysed using frequency distribution, percentage and mean while Cochran Q and Friedman tests were used to test the hypotheses of the study. The findings revealed that most respondents were male (72.58%), married (81.45%) and fairly young (average age was 35 years), and a mean family size of seven. The major agricultural activities practiced by the respondents were vegetable production (49.19%), cultivation of food crops (45.16%) and rearing of poultry (43.55%). Cochran Q test (χ^2 = 186.872; P<0.05) identified these three enterprises to be the most significant farming activities in the study area. The major constraints faced by the farmers were inadequate capital (mean=3.45), high production cost (mean=3.40), high cost of labour (mean=3.35), limited access to credit (mean=3.32) and inadequate land (mean=3.23). Friedman test (χ^2=18.013; P<0.050) revealed inadequate capital, limited access to credit and high production cost to be the most significant production limitations faced by the farmers. In conclusion, the results showed that urban farmers are engaged in several agricultural activities. However, considering the production constraints encountered by them, it is recommended that farmers' access to cheap credit be looked into to enhance their access to capital.

Keywords: Urban farming, dimensions, Edo state, constraints

Introduction

According to the National Bureau of Statistic (2014), the decline in share of agriculture in the GDP shows a substantial variation from 48.8% in the 70s, 22.2% in the '80s, to 35.6% in 2010. In 2013, the agricultural sector contributed about 23.3% to Nigeria's Gross Domestic Product (GDP), with two thirds of the nation's total labour force in the sector. Thus, the agricultural sector largely caters

for the nation's populace. Adesoji *et al.* (2006) asserted that for the agricultural system in Nigeria to be transformed, there is urgent need for farmers to imbibe the culture of innovativeness and utilization of modern systems of farming that are not only cost-effective in the long run, but also effective in meeting the farm families' goals of increased productivity, income and better living standards.

Urban agriculture is practiced in almost all metropolitan areas in both developing and developed countries. It takes place on smaller tracts of land and open spaces that are idle or unsuitable for urban development, and contribute significantly to the socio-economic development of cities throughout the world (Akpabio *et al.,* 2007). Urban agriculture is generating produce valued in tens of millions of US Dollars year in year out, in major least-developed countries' (LDCs) urban centers (Mougeot, 2006). Also, Garrett (2000) projected that by 2020, the number of people living in developing countries will grow from 4.9 to 6.8 billion. Ninety percent (90%) of this expansion will be in cities and towns, accounting for more than half the populations of Africa and Asia. As these events unfold, West Africa will not be left out. For example, Nigeria's population in 2000 was 111.6 million, while the urban population was 49.1 million. In 2006, Nigeria's population was 140 million. Using the 2006 official census figures, Nigeria's population for 2016 was projected to be 185 million, while urban population would be 97.9 million. At this rate of population growth of urbanization combined with lack of economic growth in rural areas, unemployment, poverty and urban food insecurity problems will increase over the next two decades if no action is taken to address the situation (Adeyemo and Kuhlmann, 2009).

The menace of rural-urban migration has increased food demand in the urban areas, and is expected to get worse (Cofie, 2008). This situation demands that an alternative strategy for sustaining the livelihoods of city dwellers be sought. Urban agriculture has been recognized as a veritable tool for cushioning the expanding demand for food and employment (Egbunna, 2001). However, fears have been expressed over the capability of urban agriculture to meet the growing and intimidating challenges of a rapidly expanding urban sector. A major limitation, according to Egbunna, (2008), is the lack of supporting services to enhance the performance of the urban farming system. One of such critical support services is the extension services. The traditional agricultural extension service tends to focus on rural farmers (FAO, 2005), and over time, a knowledge or data base of the rural farming system, focusing on their characteristics, practices and constraints, have been built that enables the extension service agency work with these farmers. Unfortunately, urban agriculture has not received such attention, either from the government or its relevant agencies (Grain, 2009). Thus, this study seeks to address this gap by providing answers to the following questions:

i. What are the socio-economic characteristics of urban farmers in the study area?

ii. What are the types of agricultural enterprises or activities engaged in by urban farmers in the study area?

iii. What are the constraints faced by urban farmers in the study area?

Objectives of the Study

The overall aim of this study is to examine the dimension of and constraints associated with urban agriculture in Edo State, Nigeria. The specific objectives are to:

i. describe the socio-economic characteristics of urban farmers in the study area;

ii. examine the dimensions of urban agricultural activities in the study area; and

iii. identify the constraints associated with urban farming in the study area.

Hypotheses of Study

The following null hypotheses were tested:

H_{O1} There is no significant difference among the dimension/types of urban agriculture activities carried out by the respondents.

H_{O2} There is no significant difference among the constraints associated with urban farming in the study area.

Methodology

This study was carried out in Edo State. Edo State is an inland state in south central Nigeria, formed in August 1991 by the split of Bendel State into Edo and Delta states. It is one of the thirty six states of Nigeria with an estimated population of 4,124,835 in 2015 (Annual Population Projection by LGA, Edo State, 2006-2015) and a total land area of 19,794km^2. The state lies approximately between latitudes $5^0$44'N and $7^0$37'N and between longitudes $5^0$44' and $6^0$43'E. The State is in a low-lying area, except to the north, where it is marked by undulating hills rising to a peak of about 672 meters above sea level (Edo State Statistical Year Book, 2013). The State has three agricultural districts - (Edo south, Edo north and Edo Central), and 18 Local Government Areas.

This research was carried out using the survey method. The study covered three major towns namely, Benin City, Ekpoma and Auchi, in the three senatorial districts of Edo State; namely Edo South, Edo Central and Edo North respectively. Data for this study were generated mainly from primary sources, using a structured questionnaire for the lettered farmers, and interview schedules for the non-lettered respondents. Data were collected from 124 urban farmers who were sampled using snowball technique from the purposively selected towns mentioned above. These towns are the major urban areas in the senatorial zones of the State. The data were analysed using frequency distributions, percentages and means, while Cochran Q and Friedman tests were used to test the hypotheses of the study.

Variable Operationalization

Dimensions of urban agriculture

This refers to the types of agricultural activities carried out. This was measured by asking respondents to indicate the type of agricultural activity they carried out.

Constraints to Urban Agriculture

Respondents were asked to indicate the barriers to urban agriculture on a 4-point Likert scale ranging from *very serious* coded (4), *serious* (3), *little serious* (2), *not serious* (1). The weighted mean score was used to determine which constraints were serious or not. This benchmark or mean score was computed as: (4+3+2+1)/4 = 10/4 = 2.50. Constraints with value of 2.50 and above were considered as serious while those having less than 2.50 were regarded as not serious.

Results and Discussion

The pooled results (Table 1) shows that majority (72.58%) of the urban farmers were male, while female constituted 27.42%. The result indicates that urban farming in the study area was dominated by the male folks. This reason for this could be that the men, culturally perceived to have a greater responsibility of catering for the family, must engage in other sources of livelihood in order to accomplish this responsibility. Similar results regarding high (>60%) male involvement in urban farming was reported by Olaniyi (2012). The pooled result shows that a higher proportion of the urban farmers (33.06%) were 31-40 years old, 30.65% were 41-50 years old, while 18.55% were above 50 years old. The average age of the respondents was 35.5 years, implying that most of the urban farmers were in their active and productive age. This finding is in line with that of Ango *et al.* (2011), who reported that majority of farmers of this age category were in their productive years, and better able to effectively cope with the rigors of urban farming.

The pooled result (Table 1) also revealed that majority of the urban farmers (81.45%) were married, 14.52% were single, while 3.23% were widows or widowers. The high participation of married persons in urban agriculture may be because they perceived urban farming as a means of improving their livelihoods as well as those of their families. Similar finding had been reported by Aja *et al*. (2010) and Agbugba *et al*. (2014), who found out that a greater percentage of urban farmers in Ebonyi State were married. The respondents were generally literate, with 37.90% having HND/BSc, 25.81% having MSc/PhD, 19.35% having OND, and 12.10% and 4.84% having secondary and primary education respectively. The preponderance of persons with tertiary education probably reflected the urban nature of the study area and the fact that such areas are home to tertiary institutions. For example, the federal University of Benin is locate in Benin City, the State University is located at Ekpoma, while a Federal Polytechnic is situated at Auchi. The attainment of some educational qualification is expected to positively influence the application of modern farming practices among farmers. Onemolease (2004) and Aja *et al*. (2010) reported that education enhances farmers' understanding and utilization of modern technologies in their enterprise.

The pooled result (Table 1) also revealed that the household size for majority (52.42%) of the respondents was 5-8 persons, followed by household size of 1-4 persons (47.58%). The average household size was 7, showing that the respondents had people depending on them, and which they needed to carter for. This fact is likely to have motivated individuals to engage in urban

Table 1: Socio-economic characteristics of urban farmers

		Edo South (n=40)		Edo Central (n=51)		Edo North (n=33)		Pooled (n=124)	
Categories		Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gender	Female	12	30.00	14	27.45	8	24.24	34	27.42
	Male	28	70.00	37	72.55	25	75.76	90	72.58
Age (Years)	≤ 30	8	20.00	7	13.73	7	21.21	22	17.74
	31-40	14	35.00	17	33.33	10	30.30	41	33.06
	41-50	11	27.50	16	31.37	11	33.33	38	30.65
	> 50	7	17.50	11	21.57	5	15.15	23	18.55
Marital Status	Married	32	80.00	41	80.39	28	84.85	101	81.45
	Single	7	17.50	7	13.73	4	12.12	18	14.52
	Divorced			1	1.96			1	0.81
	Widow(er)	1	2.50	2	3.92	1	3.03	4	3.23
Education	Primary	2	5.00	2	3.92	2	6.06	6	4.84
	Secondary	7	17.50	4	7.84	4	12.12	15	12.10
	OND	11	27.50	8	15.69	5	15.15	24	19.35
	B.Sc/HND	17	42.50	22	43.14	8	24.24	47	37.90
	M.Sc/Ph.D	3	7.50	15	29.41	14	42.42	32	25.81
Family size	1-4	23	57.50	24	47.06	12	36.36	59	47.58
	5-8	17	42.50	27	52.94	21	63.64	65	52.42
Association membership	Non-member	30	75.00	44	86.27	24	72.73	98	79.03
	Member	10	25.00	7	13.73	9	27.27	26	20.97
Occupation	Civil service	14	35.00	29	56.90	15	45.5	58.0	46.8
	Trading	4.0	10.00	7	13.70	4.0	12.1	15.0	12.2
	Private sector	5.0	12.50	5	9.80	4.0	12.1	14.0	11.3
	Artisan	2.0	5.00	1	2.00	1.0	3.0	4.0	3.2
	Others	3.0	7.50	1	2.00	3.0	9.1	7.0	5.7

Source: Field survey, 2016; Freq. = Frequency

farming in order to improve their income levels. This finding is in line with that of Lee-Smith (2010) who stated that urban farming contributes to food security and poverty-reduction in developing countries, where the involvement of the household size is high.

Table 1 also revealed that majority (79.03%) of the respondents were not members of any farm association, while 20.97% belonged to associations. This finding suggests a very low participation in cooperative associations among the respondents, and this may have limited their access to capital for investment purposes. This agrees with the report of Salau and Attah (2010), who asserted that low participation of persons in social/cooperative groups poses a serious disadvantage to them, because they are not likely to enjoy any of the benefits of cooperative or association membership such as access to funds. The major occupation of the respondents was civil service (46.8%), while the least was trading (12.1%); 11.3% of them were workers in the private sector, 3.2% were artisans while 5.7% were engaged in other economic activities.

Dimensions of urban farming

The type of urban agriculture practised by the respondents was categorized into two, i.e. the type of crops grown and livestock reared. Table 2 show that the crops grown by majority of the respondents were vegetables (49.19%), while 45.16% grew food crops such as yam, cassava, potato, okra and maize. An examination of the livestock reared revealed that a higher proportion of the respondents (43.55%) were engaged in poultry production, 13.71% were into sheep and goat while 8.06% were into fish production. This shows that the respondents participated in many forms of agricultural enterprises within the crop and livestock sub-sectors. However, while vegetables and food crops dominated the cropping system, poultry production dominated the livestock system. A study by Hafu (2016) showed that poultry production was the dominant agricultural livestock practice, while vegetable gardening was reported by Agbo *et al.* (2015) to be the commonest crop production enterprise among urban farmers.

Table 2: Dimensions of urban farming among respondents

Type	Edo South		Edo Central		Edo North		Pooled*	
	Freq	%	Freq	%	Freq	%	Freq	%
Crops Grown								
Vegetables	16	40	24	47.06	21	63.64	61	49.19
Food crops	20	50	18	35.29	18	54.55	56	45.16
Cash crops	10	25	8	15.69	4	12.12	22	17.74
Horticultural crops			1	1.96	1	3.03	2	1.61
Livestock Reared								
Poultry	17	42.5	23	45.1	14	42.42	54	43.55
Sheep and goats	3	7.5	8	15.69	6	18.18	17	13.71
Fish	10	25					10	8.06
Rabbits			1	1.96			1	0.81

*Multiple response; Freq. = Frequency
Source: Field survey, 2016

Constraints faced by urban farmers

Based on the mean benchmark of 2.50, the pooled result of Table 3 reveals that all the constraints listed in the table were serious except inadequate market (mean = 2.41) high tax (mean = 2.33) and harassment by LGAs officers (mean = 2.06). However, the pooled result showed that inadequate capital (mean = 3.45) was the most serious constraint. The reason inadequate capital is a major constraint may be as a result of the fact that most urban farmers do not have access to credit, considering that some of the practices recommended by the agricultural extension service require capital for effective implementation. Egbunna (2008) reported that inadequate capital was a major constraint limiting individuals from engaging in urban farming. Studies by Makaru *et al.* (2011) also confirmed this. For most respondents, lack of access to credit (mean = 3.32) was a major

bottleneck in their capacity to maintain and expand their production scale. This finding is in line with Adeoti *et al.* (2010).

Furthermore, the study identified inadequate land (mean = 3.23), high production/inputs costs (3.40) and labour cost (3.35) as major challenges confronting the farmers in the study area. Others include poor produce pricing by consumers (2.67) and inadequate storage facilities (2.94).The general finding suggests the farmers were faced with a myriad of constraints, and this can limit their productivity and income

Table 3: Constraints encountered by respondents

	Edo South		Edo Central		Edo North		Total	
Constraints	**Mean***	**SD**	**Mean***	**SD**	**Mean***	**SD**	**Mean***	**SD**
Inadequate capital	3.40	.87	3.55	.58	3.36	.78	3.45	.74
High production cost	3.55	.68	3.25	.66	3.45	.67	3.40	.67
High cost of labour	3.55	.55	3.31	.73	3.15	.87	3.35	.73
Limited access to credit	3.28	1.06	3.51	.70	3.09	1.07	3.32	.94
Inadequate land	3.38	.77	3.20	.72	3.09	.88	3.23	.78
Inadequate storage and processing facilities	3.03	.97	2.86	1.02	2.97	1.02	2.94	1.00
Poor pricing of produce	2.55	.96	2.76	1.01	2.67	.92	2.67	.97
Inadequate market	2.48	1.09	2.43	1.06	2.30	1.05	2.41	1.06
High Tax	2.28	1.13	2.51	1.08	2.12	1.11	2.33	1.11
Harassment by LGA Officers	2.15	1.03	2.12	.84	1.88	.93	2.06	.93
Average	**2.97**		**2.95**		**2.54**		**2.92**	

**Serious (mean > 2.50.*
Source: Field survey, 2016

Test of difference in urban farming activities of respondents (Cochran test)

Cochran Q test was used to determine the significance of the differences among the dimension or types of urban farming activities carried out by the respondents (Table 4). The Cochran test result ($\chi^2 = 186.872; df = 7; p < 0.05$) was significant, meaning that significant differences existed among the urban farming activities engaged in by the respondents. In other words, the respondents were significantly more engaged in some than in others. The post-hoc test (represented by superscripts) showed that vegetables (49.19%), food crops (45.16%) and poultry (43.55%) were the most significant farming activities engaged in by respondents while the least were horticultural crops (1.61%) and rabbit production (0.81%). The farmers' participation in cash crops (17.74%) and sheep/goat (13.71%) and sheep/goat (13.71%) was not statistically different, but their level of engagement in these activities was significantly higher than that of fishery (8.06%), horticultural crops (1.61%) and rabbit farming (0.81%), with the last two being the least significant.

Test of difference among constrains faced by urban farmers (Friedman test)

Friedman test was used to analyze the hypothesis which states that, there is no significant difference among the constraints of urban farmers. The result is presented in Table 5. Friedman

Table 4: Cochran Q test result for differences in urban farming activities engaged in by respondents

Type	Engagement	
	Frequency	%
Vegetables	61	49.19[a]
Food crops	56	45.16[a]
Poultry	54	43.55[a]
Cash crops	22	17.74[b]
Sheep and goats	17	13.71[b]
Fish	10	8.06[c]
Horticultural crops	2	1.61[d]
Rabbits	1	0.81[d]

Cochran's Q (χ^2) = 186.872; df = 7; critical χ^2 = 14.067

test result, which yields a chi-square value (χ^2*= 318.01; df= 9; p<0.05*) was significant, which means that there was a significant difference among the constraints of the respondents. The post-hoc mean separation, reflected in the superscripts against each mean rank in the table, reveals that though inadequate capital (mean rank=7.21) and limited access to credit (mean rank=6.82) were the highest ranked constraints, their seriousness as constraints was not significantly different from high cost of production inputs (mean rank=6.81), high labour cost (mean rank=6.51) and non-availability of land (mean rank=6.25). However, these constraints were significantly more serious

Table 5: Friedman test result for difference in constraints faced by respondents

Constraints	**Mean Rank**
Inadequate Capital	7.21[a]
Limited access to credit	6.82[a]
High Production cost	6.81[a]
High cost of labour	6.51[ab]
Inadequate land	6.25[ab]
Inadequate storage and processing facilities	5.57[b]
Poor pricing of produce	4.60[c]
Inadequate market	4.08[cd]
High Tax	4.04[cd]
Harassment by LGA Officers	3.12[d]

Friedman test (Chi-Square) = 318.013; df = 9; critical χ^2 =16.919

relative to inadequate storage/processing facilities (mean rank=5.57), low produce prices (mean rank=4.60), limited markets (mean rank=4.08) and high tax (4.04). The least significant constraints were inadequate market (mean rank=4.08), high tax (mean rank=4.04) and harassment by LGA officers (mean rank=3.12).

Conclusion

Urban farming plays an important role in the lives of respondents currently engaging in the practice. The practice has a dual impact; it provides food, and generates money saved for other

uses. The main aim was to identify the characteristics of urban farmers, the dimensions of urban farming and the constraints associated with this form of farming. The study has shown that the major farm enterprises of urban farmers in the study area were vegetable and food crop cultivation, while poultry production was the main livestock reared. These are important livelihood options for low income households. However, another important find of this study was that urban farming system is characterized with several challenges.

Recommendations

Based on the findings, the following recommendations are made;

i. Extension agents should sensitized and educated the famers to make more efficient use of available land by introducing improved farming practices such as improved varieties with potentials for enhanced yield. This will help address the challenge of inadequate land.

ii. The farmers should be encouraged to participate in associations as this will enhance their access to farm credit, which they can invest in their farm enterprise.

iii. Farmers should be encouraged to engage in value-chain processes to ameliorate the challenge of inadequate storage. This will help increase shelf life of product and also reduces produce spoilage.

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