AN ANALYSIS OF AFFORDABILITY OF LAND FOR URBAN CROP FARMING IN LAGOS, NIGERIA

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Abstract
The study highlighted the following major points (1) Recognition of urban crop farming to enhance its continued contribution to sustainable land management. (2) The question whether affordability constraint in land accessibility can affect the productivity of urban crop farmers. Respondents of seven communities were selected through simple random sampling and administered with structured questionnaires. Data collected were analyzed using descriptive statistics while regression analysis was used to investigate the research hypothesis. The study showed that most of the lands used by urban crop farmers were owned by public authorities (65.8%), private organizations (23.9%) and individuals (7.2%). They largely gained access to land through squatting or land grabbing (60.1%) and renting (28.7%) due to high rents or prices. The regression analysis established that affordability constraint (an independent variable) accounted for 10% of farmers' productivity which could be improved by tackling problems associated with affordability. It also provided a blueprint for policy makers that would lead to equitable land distribution in the Lagos metropolis.
Keywords: Land distribution, urban crop farming, sustainable productivity, Lagos, Nigeria

Background to the Study

The population of Lagos State has been growing in leaps and bounds particularly since its creation in 1967. From a population of 25,000 in 1866 (Ayeni as cited in Abiodun, 1997), Lagos transformed through different population levels: 40,000 in 1901, 74,000 in 1911 and 665,000 in 1963 (Abiodun, 1997). Although, the 2006 national population census exercise puts it at 9,013,534, the Lagos State Authorities claimed it was over 18 million people currently. The high rate of industrial growth in the pre-SAP (structural adjustment programme) era undoubtedly precipitated the unprecedented urbanization of Lagos (Enterprise Consulting Group Ltd. as cited in Abiodun, 1997). Thus, the distribution of the available land mass of 109,840 hectares entails fierce competition for the various land uses without any official land zoning for the informal sector activities. Consequently, urban crop farming as an informal sector activity (Howorth, Convery and O'Keefe, 2001; Ndi, 2009) is not considered in the scheme of things and has no official land use zoning. The activity is known to afford households self-sufficiency in food provision thereby enhancing food security, income and employment generation. As an integral part of urban agriculture, urban crop farming is defined as "an industry located within (intra-urban) or on the fringe (peri-urban) of towns, urban centers or cities, which grows or raises, processes and distributes a diversity of food and non-food products, reusing mainly 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" (Mougeot, 2000; Knowd, Mason and Docking, 2006). However, urban farmers, according to Tinsley (2003) do not generally have access to land as they are unable to compete with other uses for the high-valued land. Land is quite critical to the survival of the activity, although other systems of urban crop farming such as hydroponics have been developed particularly in cities where there is acute shortage of arable land. Ukaejiofo (2010) also emphasized the status of land as a source of livelihood, employment and wealth. Affordability constraint in land accessibility indicates whether the urban crop farmer has enough money to purchase or rent land for the activity. That is, can the urban crop farmer afford to access the available

land? This ability is measured by the price or the yearly rent viz-a-viz other costs such as cost of hiring labour, cost of applying fertilizer, cost of purchasing seedlings, cost of harvesting, cost of wetting or irrigating and income generated from farm and non-farm activities. Lack of access to land means the farmer will access land informally and usually marginal lands such as wetlands, steep slopes, road setbacks, buffer zones at airports and etc.

Velez-Gerra (2004) identified multiple means of accessing land for urban agriculture as formal, informal and semi-informal means which are manifested through customary, statutory and hybrid laws. He, however, noted that these modes of access did not confer any tenure security and suggested that the most appropriate mode of accessing land by urban crop farmers was access through customary or statutory law made possible through government recognition and support. Thus, urban crop farmers largely access land by renting, inheritance, borrowing, squatting, leasing and spontaneous occupation. These methods of accessing land were also reiterated by Crush *et al.* (2011). The study of Aina *et al.* (2012) further established that urban farmers accessed land through personal ownership (32.86%), borrowing (21.42%), renting (31.42%) and leasing (14.29%). Reuther and Dewar (2005) however, noted that a potential land shortage posed problem to urban crop farming because of competition with housing development and other incompatible uses such as "ecological corridors and storm water management areas." Asiama (2005) further confirmed that one of the greatest impediments to urban crop farming was access to land as urban land was considered too valuable to devote to agriculture. Urban crop farming is commonly known to be useful as a coping strategy for the urban poor and a key concept in urban development (Adedeji and Ademiluyi, 2009), an ameliorating factor for socio-environmental problems (Odudu 2009), waste water re-use (Ruma and Sheikh, 2010) while its productivity status has hardly been discussed in literature. Mubvami, Mushamba and van Veenhuizen (2003) on the other hand, noted that the poor productivity of urban farmers was because land for the activity was either not available or when available it might not be accessible, and when accessible it might not be useable for a particular form of agriculture. Although land for the activity appears scanty because of difficulties of accessibility, crop farmers make concerted efforts to improve on the quality of their lands in a bid to enhance their level of productivity. This paper presents latent problems of equitable land distribution and the use of urban crop farming in achieving sustainable development through productivity of urban crop farmers. The paper is proposing that urban crop farming be validly recognized to enhance its productivity and its function as a tool of urban development. It therefore poses the question whether affordability constraint in land accessibility affects productivity of urban crop farmers and hence resolve the hypothesis that affordability constraint has no significant effect on urban crop farmers' productivity. The current study was therefore conducted as discussed in the next part.

Study Area

The study is limited to metropolitan Lagos which is home to many companies and industries and located in the south-western part of Nigeria. Oni (2001) defined the boundaries of metropolitan Lagos as consisting of the territory within Latitudes 6^{o} 23' N and 6^{o} 41' N and Longitudes 3^{o} 09'E and 3^{o} 20' E. Olayiwola, Adeleye and Oduwaye (2005) also noted that the Lagos lagoon stretches through the eastern boundary; bounded in the south by the Atlantic Ocean while the northern boundary has the landmass of Ikorodu local government

area and Alagbado towards Abeokuta axis in Ifako-Ijaiye local government area. Badagry and Republic of Benin define the Western boundary. Metropolitan Lagos constitutes over 1,140 km^2 (or one-third) of the total land mass (3,577 km^2) of Lagos State. Lagos has since ceased to be Nigeria's capital but still has great impact on the nation's economic development. It is still the commercial nerve centre of Nigeria as more than half of Nigeria's industrial capacity is located here. In the post-structural adjustment programme (SAP) era, many of the companies and industries closed business and this led to continuous retrenchments by both private and public sectors, thus, increasing the population of people in the informal sector as well as making metropolitan Lagos a good location for this study. The pressure on land by the various uses is over-whelming and distribution of land in the metropolis is relatively uneven against urban crop farming. As regards spatial distribution of urban farming communities, the Lagos State Agricultural Development Authority (LSADA) demarcated Lagos State into three agricultural blocs as eastern, western and far western blocs. The western bloc which lies within the Lagos metropolis has a high population of urban crop farmers distributed in ten agricultural circles and each circle consisting of three cells or farming communities. Communities identified included Adiyan, Iju/Grailland, Ayobo/Aboru, Idimu/Powerline, PWD Ikeja, Volkswagen/Ojo and Festac Town. (See Fig. 1).

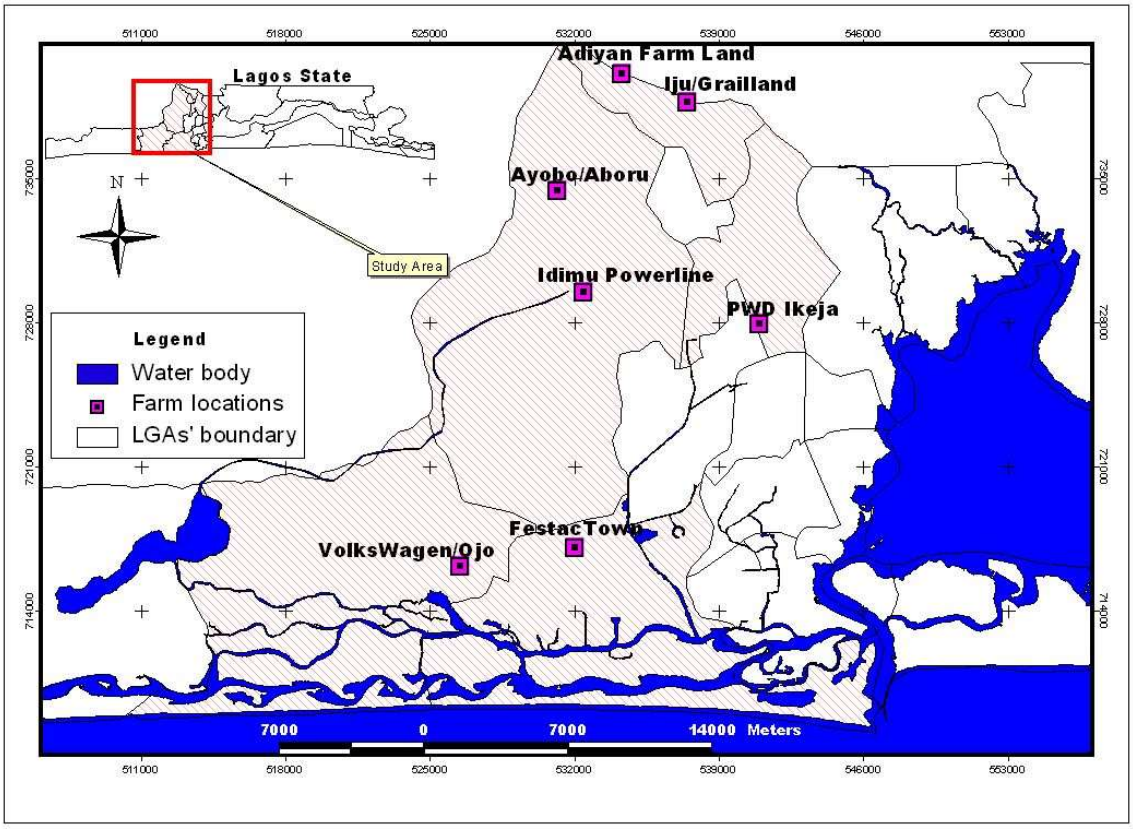

Figure 1: Metropolitan Lagos Showing the Study Locations. **Source:** Geography Department, University of Lagos, 2012

Methodology

The study population consisted of all the practitioners of urban crop farming in the western agricultural bloc (Fig. 1). Multi-stage sampling was adopted for the selection of sample size because of the complexity of the population of farmers which was distributed all over the Lagos metropolis. Purposive sampling was firstly used in this study to select seven agricultural circles from the ten circles in the metropolis. Secondly, a cell or farming community was randomly selected from each circle of three cells. This gave a total of seven farming communities.

Lists of registered urban crop farmers in each farming community were obtained from the Lagos State Agricultural Development Authority Headquarters in Oko-Oba, Agege to enable the determination of the sample size in each farming community (Fig. 1). The elements or respondents in each farming community were selected through simple random sampling from each stratum. Thus, the sample size for each population of farmers in a farming community was determined using Kish (1965) equation (see also Moore, McCabe, Duckworth and Sclove, 2003; Nirab, 2007) which noted as follows: $N = n' [1 + (n'/N)]$

Where:

N = total population (of each farming community) is recorded in the register

n = sample size from finite population

n' = sample size from infinite population calculated from the formula $[n'=S^2/V^2]$ in which,

S^2 = standard error of population elements, $S^2 = P (1-P)$; maximum at P = 0.5

V^2 = standard error of sample population equals 0.05 for the confidence level of 95%=1.96

$n' = S^2/V^2 = (0.5)^2/ (0.05)^2 = 100$.

Presented in Table 1 are the sample frame, sample size and questionnaires returned by the farmers. Copies of structured questionnaire were administered to a total of 376 respondents in the farming communities. Interview schedules with the farmers were carried out by the researcher and eight extension officers of the Lagos State Agricultural Development Authority which took place during meeting days of the various farming communities.

Table 1: Urban farmers' population, sample size and response rate

Farming Communities	**Population**	**Sample size**	**No. of Questionnaires**
Adiyan	120	55	26
Iju/Grailland	56	36	17
Ayobo/Aboru	45	31	17
Idimu/Powerline	55	36	17
PWD Ikeja	150	60	44
Volkswagen/Ojo	325	77	98
Festac Town	430	81	129
Total	1,181	376	348

Source: Field Study

Data collected were analyzed using descriptive statistics such as cross tabulations, frequency and percentages while the hypothesis was tested using linear regression analysis. Affordability variable was investigated via rent paid, quantum of rent paid, rent review clauses, sources of finance and costs of inputs. The ability to pay was measured in likert scale; quantum of yearly rent was measured in ordinal scale, manner of rent review was measured in ordinal scale, respondents' sources of finance were measured in nominal scale while expenditure on inputs was measured in ordinal scale.

Results and Discussion

This section presents data collated from the field study, data analysis, hypothesis testing and discussions.

Land Ownership

The study showed that most lands in the farming communities were owned by public bodies or government except in Idimu/Powerline and Volkswagen/Ojo communities which were highly encroached on by individuals (see Table 2). The land in Volkswagen/Ojo had since fallen into ownership of a private organization following sale of the former Volkswagen of Nigeria Factory complex while a few individuals encroached and were subletting to urban crop farmers. It would be noted that some of the respondents who had been farming in Adiyan, Iju/Grailland, Idimu/Powerline and Festac Town had been in occupation for a long time without problems and were unable to identify the actual owners of the land being used in their farming communities. The findings agreed with the ones of Hubbard and Onumah, 2001; Asomani-Boateng, 2002 that, government owned much of the lands in many cities in developing countries where urban crop farming occurred. The findings also identified serious land use inefficiencies which encouraged unauthorized use of open spaces such as roads and undeveloped public and private sites.

Table 2: Land Ownership in Farming Communities

Farming Communities	Private organization	An individual	Public body	Don't know	Other
Adiyan	0%	0%	24(92.3%)	0%	1(.3%)
Iju/Grailland	1(5.9%)	0%	15(88.2%)	0%	1(5.9%)
Ayobo/Aboru	0%	0%	17(100%)	0%	0%
Idimu/Powerline	0%	16(94.1%)	0%	0%	1(5.9%)
PWD Ikeja	0%	2(4.5%)	40(90.9%)	1(2.3%)	0%
Volkswagen/Ojo	80(81.6%)	5(5.1%)	13(13.3%)	0%	0%
Festac Town	1(0.8%)	2(1.6%)	120(93%)	0%	3(2.3%)
Total	82(23.6%)	25(7.2%)	229(65.8%)	1(.3%)	6(1.7%)

Source: Field Study

Affordability and Land Holdings

The study showed that 34.7% of the urban crop farmers could afford to pay for their lands by cash or farm produce or both while 60.7% could not afford any form of rental payment (see Table 3). Of the various farming communities, Idimu/Powerline and Volkswagen/Ojo farmers could afford to pay rents for their lands. Thus, all the farmers in Idimu/Powerline paid rents for their lands but a majority of farmers could not pay rents in Volkswagen/Ojo, while most of the farmers in Ayobo/Aboru (94.1%) could not pay rents. Generally, a majority of those in Adiyan, Iju/Grailland, Festac Town and PWD Ikeja could not afford payment of rents (80.7-86.4%).

Table 3: Distribution of Respondents in Terms of Affordability and Non-Affordability

Farming Communities	Affordability	Non-Affordability	Missing Values	Total
Adiyan	4(15.3%)	21(80.7%)	1(3.8%)	25
Iju/Grailland	1(5.9%)	14(82.4%)	2(11.8%)	15
Ayobo/Aboru	0	16(94.1%)	1(5.9%)	16
Idimu/Powerline	17(100%)	0	0	17
PWD Ikeja	6(13.7%)	38(86.4%)	0	44
Volkswagen/Ojo	86(88.6%)	11(11.2%)	1(1%)	98
Festac Town	7(5.5%)	111(86.1%)	11(8.5%)	129
Total	121(34.7%)	211(60.7%)	16(4.6%)	348

Source: Field Study

Considering affordability of rents vis-à-vis their land holding ability, only 34.7% of the crop farmers paid rents for their land holdings while up to 60.7% did not pay rent. This was because respondents generally had limited financial resources as they did not possess formal land ownership documents such as certificates of occupancy and therefore could not secure bank loans to purchase or rent land. They therefore resorted to marginal lands or illegal occupation. This therefore implied that many urban crop farmers were unable to afford any rent payment and also the main reason why most of them resorted to squatting or illegal occupation. This finding was reiterated by Bello (2007) which stated that due to the difficulties of accessing government land, 86.95% of respondents in the informal sector resorted to squatting or illegal occupation.

Hypothesis Testing

In order to establish that affordability constraint in land accessibility affected sustainable productivity of farmers, the hypothesis that affordability constraint had no significant effect on farmers' productivity was tested. The regression analysis in Table 4 showed that affordability constraint accounted for 10% of farmers' productivity. It further showed that a fall of 0.383 in farmers' productivity could be expected for a unit increase in affordability constraint while 5.073 represented the mean of farmers' productivity should affordability constraint be completely eliminated. Thus, farmers' productivity could be well improved by removing all problems relating to affordability constraint such as reducing costs incurred in yearly rent, hiring of labour, applying fertilizer, harvesting and irrigation as well as improving income from farm and non-farm activities.

Table 4: Regression Result of the Effect of Affordability Constraint on Crop Farmers' Productivity

Variable	Estimate	Std. Error	t	Sig.
(Constant)	5.073	0.349	14.536	0.000
Affordability	-0.383	0.106	-3.599	0.000*
R	0.317			
R^2	0.100			
Adjusted R^2	0.093			
Std. Error	1.185			
DW	1.451			
F	12.955			0.000

*** Significant at 0.05 level**

The study established that most of the lands in the farming communities were owned by public authorities and farmers were mostly squatting or on illegal occupation as they were

unable to purchase or pay the high rents. The study thus, established that a farmer's inability to afford land was a major constraint affecting urban crop farmers' productivity.

Conclusion and Recommendations

The study highlighted the effect of increasing population and urbanization on the distribution of available land in Lagos. It showed that there was inefficient land distribution which made it inaccessible to many in the informal subsector such as urban crop farmers and in turn affected their level of productivity. Urban crop farmers could not compete with other land uses to access land as they could not afford high land prices and rents prompting them to occupy land illegally. The study established that most of the lands used by urban crop farmers were owned by public authorities (65.8%), private organizations (23.9%) and individuals (7.2%). The farmers therefore largely gained access to land through squatting or land grabbing (60.1%) and renting (28.7%). The study consequently established that 34.7% of urban crop farmers paid rent in cash or farm produce while 60.7% did not pay rent at all. The non-affordability of land was also found to affect the productivity of the crop farmers. The study recommended that there was an urgent need for more comparative data collection on urban crop farming to appreciate its problems and potentials. The Lagos state government through urban planners should identify and make lands available and accessible by clarifying and formalizing land use and land tenure arrangements of crop farmers. The study advised the government to enact an "Agricultural Land Area Act" to prescribe certain areas of the urban areas as "Agricultural Land" in order to enhance the productivity of farmers.

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