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Effect of Urbanization on Agricultural Production in Abia State

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Abstract

This study examined the effect of urbanization on agricultural production in Abia State. Specifically, it categorized the land tenancy status of the farmers, analyzed the effect of urbanization on agricultural productivity and identified the constraints to agricultural productivity. Multistage random sampling technique was used to select the respondents. Primary data collected using structured questionnaire and interview schedules were analyzed using frequency counts, means, and percentages and regression analysis. Results showed that majority (81.7%) of the respondents cultivated both on owned and rented farms. Only 10% and 8.3% of the respondents cultivating solely on owned and rented farm lands respectively. The regression result of the effect of urbanization and other factors on agricultural productivity showed that the significant variables influencing productivity were farm size, urbanization, fertilizer/ agrochemical, land tenure system, duration of land use and cost of farm land. The major constraints to increased productivity as noted by the respondents based on their degree of effect were lack of capital for agricultural investment, lack of improved farm inputs, high cost of land, land fragmentation, high population and high cost of planting materials. The study therefore recommend that specific areas should be earmarked for agricultural use only and protected from encroachment and other competing uses through appropriate legislations and policies.

Keywords: Urbanization, Agriculture, Production, Availability

1. Introduction

The term urbanization has been described as an inter-sectorial phenomenon involving all aspects of the human society and economy (World Bank, 2000). The World Development Report 1999/2000 noted that urbanization is the outcome of the social, economic and political developments that lead to urban concentration and growth of large cities, changes in land use and transformation from rural to metropolitan pattern of organization and government. Urbanization affects all spheres of human life both in the rural and urban setting.

Urbanization - increased residential population and expansion of non-farm business and industry - increases the pressure on farmers and makes it more costly and difficult to farm in the traditional way. The issue is complicated by the fact that population and business industry growth often takes place in prime agricultural areas (Asamoah, 2010). Rapid urban population growth means an increasing demand for urban land, particularly for housing, but also for various other urban uses. Urbanization has led to land use conversion from agricultural land to urban land use, such as for infrastructure, industrial, residential or commercial uses. Such land use conversion often reduces the most fertile land, and therefore the impact on agricultural production and food security is often larger than the absolute amount of land involved (Francis *et al.,* 2013). Recent research shows that such urban land use conversion is often driven by economic factors, with positive feedback loops between urban land use expansion and economic

growth in the city, as well as in the region (Bai, 2012).

Regmi (2014) noted that recent research reports indicate that virtually all of the future world's population growth will occur in urban areas; partially reflective of rural-urban migration trends driven by relative livelihood opportunities. He stated that approximately 35% of current urban population growth globally is attributed to rural-urban migration and in sub-Saharan Africa, urban population is expected to triple in the next 40 years. Growing urbanization across the globe, therefore, has important "push" and "pull" implications for agricultural research for development.

Pramanik *et al,*. (2010) noted that urbanization and population growth has serious effect on agriculture. Iheke and Nto (2010) noted that urbanization is an important driving force in migration and commuting because urban areas offer many economic opportunities to rural people through better jobs, new skills and cultural changes. They noted that the relative proximity of urban populations to farming land may be a root cause behind the factors that contribute to loss of agricultural land and agricultural intensification. Population pressure essentially has led to suburbanization, the spreading of out of urban areas and lower density leaving for a substantial fraction of the population. This has produced a land use and quality of life problem, using up large amount of fringe areas with loss agricultural and ecological benefits.

The supply of land for urban development is determined by the customary land owners and the demand for the urban land comes from the private sector, public sector and the civil society (individuals). Such lands are put into uses that will benefit the urban populations to the neglect of agriculture. A great deal of fragmentation of holding have been going on in most densely populated areas of West Africa and the nations have always attempted to intervene in order to reverse the dominance of small holder agriculture and increase the size of production units. Urbanization leads to the inaccessibility of land, land fragmentation, change in land supply, and rapid increment in land values. This does not create a favourable environment for the development of agriculture.

It is widely recognized that in addition to the direct effects development has on agriculture (the loss of land that had been in agricultural production), development also affects the remaining agriculture indirectly (Berry, 1978; Berry and Plaut, 1978; Plaut, 1980; Lopez *et al.,* 1988; Lockeretz, 1989; Adelaja *et al.,* 1998). These indirect effects can be placed in four categories (Lopez *et al.,* 1988): regulatory effects, technical efficiency effects, speculative effects and market effects. For the most part, these indirect effects of development increase costs and thereby reduce the profitability of staying in production agriculture.

Motamed *et al.,* (2010) noted that locations with more favorable natural agriculture endowments tend to get urbanized earlier in history. Improvement in agricultural productivity is hence believed to be an important contributor to the urbanization process. The argument is that higher agricultural productivity provides food and other agricultural products with less manpower and thus allows for a shift of labor out of agriculture and into industry.

This study therefore examined the effect of urbanization on agricultural production in Abia state, Nigeria. Specifically, it identified the land use practices (land tenure systems) prevalent in the study area; analyzed the effect of urbanization on agricultural productivity and identified the constraints to agricultural productivity.

2. Materials and methods

The study was conducted in Abia State, in the South- East Agro-Ecological Zone of Nigeria. With a population of 2,833,999 persons, the state has a population density of 578 persons per square kilometers (National Population Commission, 2007). The State lies within latitudes 4° 40' and 6° 14' North of the Equator and longitudes 7° 10' and 8° 00' East of the Greenwich Meridian. The State shares common boundaries with Imo State on its Western part, on the North and North East with Anambra, Enugu and Ebonyi State bound it. Cross River and AkwaIbom State bounds it on the East and South East while it shares its Southern borders with Rivers State where the Imo River demarcates the two states. The major occupation of the rural inhabitants is agriculture, with cassava, yam, cocoyam, maize, okra and melon as their major crops. Oil palm and rubber are the major cash crops produced in the State. Abia State is made up of 17 Local Government Areas, and three Agricultural Zones namely: Aba, Ohafiaand Umuahia Agricultural Zones (Abia ADP, 2004).

Multistage random sampling technique was used to select the respondents. In the first stage, 2 Local Government Areas (LGA)were selected from each Agricultural Zone by simple random sampling technique. In the second stage, 10 arable crop farmers were selected from each LGA, giving a sample size of 60 respondents.

Primary data collected using structured questionnaire and interview schedules were analyzed using descriptive statistical tools like frequency count, mean, percentage, etc. and inferential statistical tools like regression analysis, using the

ordinary least squares (OLS) estimation technique. The model is specified implicitly as:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8)$ (1)

Where; Y = Agricultural productivity measured as total value of output/ total value of input; X_1 = farm size in hectares; X_2 = capital (naira) (depreciation in farm tools and implement, land rent, interest on borrowed capital, etc); X_3 = urbanization measured by decrease in farm size; X_4 = value of planting materials (naira); X_5 = fertilizer / Agrochemicals; X_6 = Duration of land use; X_7 = land tenure system practiced by respondent (own land=1; rented land=0), and X_8= cost of farm land (naira)

3. Results and discussion

3.1 Land ownership status

The distribution of the respondents based on the ownership status of the farm land cultivated is presented in Table 1.

Table 1. Distribution of respondents based on land ownership status

Land acquisition	Frequency	Percentage
Owned	6	10
Rent	5	8.3
Combined	49	81.7

The result showed that majority (81.7%) of the respondents cultivated both on owned and rented farms. Only 10% and 8.3% of the respondents cultivated solely on owned and rented farm lands respectively. Tenancy status of a farmer is an important factor affecting farmers' productivity. Deb *et al.* (2015) noted that positive association exists between land ownership and productivity. With insecure land use rights, the farmers find it difficult to make improvements aimed at enhancing productivity on the land. Iheke and Echebiri (2010) noted that insecurity of tenure associated with leasehold or renting of land serves as disincentive to farmers from investing meaningfully on the land as the land goes back the to the owner after the cropping season. An owner of a resource with a well-defined property right has a powerful incentive to use that resource efficiently because a decline in the value of that resource represents a personal loss. Farmers who own the land have an incentive to fertilize and irrigate it because the resulting increased production raises income level. Similarly, they have an incentive to rotate crops when that raises the productivity of the land.

3.2 Urbanization and agricultural productivity

The regression result of the effect of urbanization and other factors on agricultural productivity is presented in Table 2. From the Table, the semi log functional form was chosen as the lead equation based on the magnitude of the coefficient of multiple determinations (R^2), the number of significance variables, the conformity of the signs borne by the coefficient of the variables to *a prior* expectation as well as significance of the F - ratio. The coefficient of multiple determinations was 0.7831. This implies that 78.31% of the variations in productivity of the farmers were explained by the variables included in the model. The F -ratio was significant at 1% level of significance indicating the goodness-of-fit of the model. The significant variables influencing productivity were farm size, urbanization, fertilizer/ agrochemical, Land tenure system, Duration of land use and cost of farm land.

The coefficient of farm size was significant at 1% level of significance and positively related to productivity. This implies that productivity of the farmers increases with increase in farm size. Iheke (2009) noted that positive relationship between farm size and productivity could be as a result of the application of superior technology and mechanization which is only possible for large farms.

The coefficient of urbanization was significant at 1% level of significance and negatively related to the productivity of the farmers. This implies that increased urbanization would lead to decrease in agricultural productivity. This could be as a result of loss of farm lands or decreasing farm size leading to in most cases continuous cropping of available land with the consequent decline in soil fertility and hence decreases in productivity.

The coefficient of fertilizer/agrochemical was significant at 5% level of significance and positively related to productivity. This implies that productivity of the farmers increases with increase in fertilizer/ agrochemicals usage. Fertilizer applications improve soil fertility, thereby enhancing soil productivity and the use of pesticides and herbicides helps in reducing on-field crop losses.

The coefficient of duration of land use was significant at 5% level of significance and negatively related to the productivity of the farmers. This implies that increased duration of land use would lead to decrease in agricultural productivity. Increased duration implies declining fallow periods and increasing land intensification, which without supporting farm inputs such as fertilizer and other technologies leads to decline in productivity.

The coefficient of land tenure system and cost of land were positive significant at 1% level of significance respectively and positively related to productivity. This implies that increase in these variables would lead to increase in productivity. This does not conform to a prior expectation. Cultivators pay high rent cost for the lands under adverse

circumstances, productivity is causality. Also the high man – land ratio in the developed countries of the world is contrasted by low man-land ratio in the developing countries, overcrowding in agriculture has resulted in fragmentation of land and pseudo-unemployment in agriculture. Currently, land accessibility particularly for farming purposes is becoming increasingly difficult. Mabogunje (1992) observed that, this is so because customary land tenure operates alongside Western tenurial systems in many urban centers resulting in great ambiguity surrounding land policies and objectives. A major bye product of this is the disintegration of customary land tenure systems.

3.3 Constraints to agricultural productivity

The distribution of the respondent based on major constraints to agricultural productivity is presented in Table 3. The major constraints to increased productivity as noted by the respondents based on their degree of effect were lack of capital for agricultural investment, lack of improved farm inputs, high cost of land, land fragmentation, high population and high cost of planting materials. These problems must addressed if the productivity of the farmers are to be enhanced and if the nation's goal of achieving self-food sufficiency is to be realized. Particularly, the failure to invest adequately in agriculture and the rest of the food system can choke off the process of structural transformation and hunger alleviation. Not only is the food system a major employer of the poor, but it also generates capital, inputs, and demand necessary for expansion of non-agricultural sectors.

Table 2. Regression estimates of effect of urbanization and other factors on productivity

Variables	Linear	Exponential	Double log	Semi log +
Intercept	2.800936	1.06126	-0.1460876	12.32086
	(1.86) *	(4.40)***	(-0.15)	(3.61)***
Farm size (X_1)	1.716354	0.068292	0.0653028	0.0439824
	(2.46)**	(2.12)**	(1.18)	(3.67)***
Capital (X_2)	-0.0000215	-3.95e-06	0.0001733	0.0373929
	(-1.03)	(-1.18)	(2.24)**	(0.06)
Urbanization (X_3)	0.0313334	0.0083881	0.0551071	-1.201073
	(0.44)	(0.74)	(0.59)	(-2.61)***
Planting material (X_4)	0.0972479	0.0343528 (0.31)	0.7749819	0.5673878
	(0.14)		(2.32)**	(0.82)
Fertilizer agrochemical (X_5)	-0.1328026	0.0000296	-0.2895308	1.226404
	(-1.15)	(2.39)	(-2.59)**	(2.17)**
Duration of land use (X_6)	0.189115	0.0361123	0.7404134	-1.845013
	(1.38)	(1.65)	(3.34)***	(-2.45)**
Land tenure system (X_7)	-0.0884062	0.0125434	0.4874133	1.317673
	(-2.48)***	(2.43)	(2.25)**	(2.60)***
Cost of farm land (X_8)	21.75335	0.02943048	0.262893	0.4083106
	(2.06)**	(2.13)**	(0.28)	(2.29)***
R^2	0.6677	0.6202	0.7252	0.7831
Adjusted R^2	0.6068	0.5662	0.6612	0.7569
F. ratio	5.16***	4.52***	5.17***	6.18***

*** = significant at 1%, ** = significant at 5%, * = significant at 10%, + = Lead equation and the values in bracket are the t - values.

Table 3. Distribution of the respondent based on constraints to agricultural productivity

Constrains	Frequency ***	Percentage	Rank
Lack of capital for investment in agriculture	60	100.0	1st
Lack of improved farm inputs	53	88.0	2nd
High cost of land	48	80.0	3rd
Land fragmentation	39	65.0	4th
Increased population	39	65.0	4th
High cost of planting material	18	30.0	5th

Source: Field survey, 2015.
*** Multiple Responses recorded

4. Conclusion

It could be concluded from this study that increased rate of urbanization causes loss of farm lands/decreasing size of cultivated farm lands; leading increased land use intensity which in the absence of supportive technologies and inputs result to decrease in agricultural productivity. Therefore, specific areas should be earmarked for agricultural use only and protected from encroachment and other competing uses through appropriate legislations. Also, policies that will grant farmers secured right to use land should be implemented for increased productivity.

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اثر شهرنشینی در تولید محصولات کشاورزی در ایالت ابیا

اونووچکوا رافائل ایهکی و اوکاندا ایهوما

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چکیده

این مطالعه اثر شهرنشینی بر تولید محصولات کشاورزی در ایالت ابیا را مورد بررسی قرار داده است. به طور خاص، اثر مالکیت زمین و شهرنشینی بر بهره‌وری کشاورزی مورد تجزیه و تحلیل قرار گرفته و محدودیت های بهره وری کشاورزی شناخته شده است. روش نمونه‌گیری تصادفی چند مرحله‌ای بوده است. اطلاعات اولیه با استفاده از پرسشنامه ساختاریافته و مصاحبه برنامه‌ریزی شده جمع‌آوری گردید. با استفاده از فراوانی، درصد و تحلیل رگرسیون داده‌ها مورد تجزیه و تحلیل قرار گرفتند. نتایج نشان داد که اکثریت (۸۷/۷٪) پاسخ‌دهندگان به هر دو شکل اجاره‌ای و بهره‌برداری ملکی نسبت به کشت محصول می‌پردازند. فقط به ترتیب ۱۰٪ و۸/۳٪ از پاسخ‌دهندگان به صورت ملکی و اجاره‌ای فعالیت می‌کنند. نتیجه رگرسیون اثر شهرنشینی و عوامل دیگر در بهره‌وری کشاورزی را نشان داد. متغیرهای مهم مؤثر بر بهره‌وری تولید عبارت بودند از: اندازه مزرعه، شهرنشینی، میزان مصرف کود و سموم شیمیایی، سیستم اجاره‌داری، مدت زمان استفاده از زمین و هزینه کشاورزی. محدودیت‌های اصلی در افزایش بهره‌وری شامل فقدان سرمایه‌گذاری کشاورزی، عدم نهاده‌های بهبود یافته، هزینه‌های بالای زمین، خرد بودن اراضی، جمعیت بالا و هزینه‌های بالای کاشت بود. توصیه می‌شود که مناطق ویژه برای کاربری کشاورزی اختصاص داده شده و از تغییر کاربری برای دیگر بخش‌ها که با این بخش در رقابت می‌باشند از طریق قوانین و سیاست‌های مناسب محافظت شود.

کلمات کلیدی:
شهرنشینی،
کشاورزی، تولید،
در دسترس