Economic Analysis of Exotic Vegetable Production among Urban Fadama Women Farmers in Akinyele Local Government Area Oyo State, Nigeria

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Abstract: There is a steady increase in the number of people living in and around cities. The costs of supplying food from rural areas to urban areas are also rising. In urban areas, a few part-time growers devote time to the production of exotic vegetables at backyards as urban and marginal farms. This paper examines the economic importance of exotic vegetable production under Fadama system in Akinyele local government area of Oyo state. One hundred respondents were chosen using multistage sampling technique and information was collected from them with the aid of a well-structured questionnaire. Data were analysed using descriptive statistics such as frequencies and percentages as well as profitability analysis to determine the profitability level of the enterprise. Results obtained from various profitability ratios showed that exotic vegetable farming is a profitable venture that requires little capital and has become a source of livelihood to the farmers in the business. The significant variables that influenced vegetable production include farm size, quantity of fertilizer, insecticide, as well as labour. Profit can be maximised with the following in place; extension services, use of insecticides, availability of exotic vegetable seeds and provision of incentives to the exotic vegetable growers. The increase in their output level and profit will contribute significantly to food security in the country.

Key words: Urban agriculture, Fadama, profitability analysis, Nigeria

INTRODUCTION

The world's population is rapidly becoming urbanised as the world's urban population increased from 30 percent in 1950 to 47 percent in 2002 (Kennedy, 2003). Thus the number of people living in and round cities is on the increase. About 50 percent of the world's population now lives in cities; 77 percent of Latin Americans live in cities, while in Asia and Africa the proportion is currently 39 per cent, climbing at a rate of 3 and 4 per cent per year respectively. The numbers of urban poor are rapidly increasing. Urbanisation in sub-Saharan Africa is growing at alarming trends such that as population grows at an annual rate of 2.8 percent, urban population grows at a rate of 6.8 percent. In Nigeria, population grew at an average of 2.83 percent between 1999 and 2004 while urban population grew at the rate of 4.7 percent within the same period. This rapid increase in urbanisation poses new and different challenges for food security. It is hard for most cities in developing countries to provide sufficient employment for their rapidly increasing population. Meanwhile, transmissible diseases such as HIV/AIDS have eroded the income-earning capacity and assets of millions of urban households. As a consequence, the

urbanisation process goes hand in hand with increase in urban poverty, dubbed the 'urbanisation of poverty' (Haddad et al., 1999). According to UN-HABITAT, slum populations in urban areas of developing countries were estimated at 870 million in 2001 and are expected to increase by an average of 29 million per year up to 2020. The costs of supplying and distributing food from rural areas to urban areas or importing food for the cities are also rising. The distribution within cities is again uneven. As a consequence, urban food insecurity will continue to increase (Argenti, 2000). The problems associated with this trend demand creative and multi-dimensional approaches. The city authorities are therefore faced with challenges of creating sufficient employment, providing basic services such as drinking water, sanitation, health services among other socially sustainable strategies for the communities. Thus, cities are fast becoming the principal territories for intervention and planning of strategies that aim to eradicate hunger and poverty and improve livelihoods, requiring innovative ways to enhance the food security and nutrition of the urban poor and vulnerable households. Interventions into urban systems must therefore recognise and reflect the complex interaction of social, economic and environmental factors that drive the daily life of cities.

Urban agriculture is one such strategy that enhances food security, stimulates local economic development, and facilitates social inclusion and poverty alleviation (Hovorka and Keboneilwe, 2004). Urban agriculture is therefore a response to the market demands resulting from rapid urbanisation. It includes activities such as production of food and non-food plants, tree crops and animal husbandry within and at the fringes of cities. Urban agriculture, when conceived as an intervention, positively affects a wide variety of urban issues. In addition to its direct contribution to urban food security and nutrition, urban agriculture also touches on public health, economic development, social inclusion as well as urban environmental management.

Urban agriculture (often differentiated as intra-urban and peri-urban agriculture) can be defined as the production of food (for example, vegetables, fruits, meat, eggs, milk, fish) and non-food items (for example, fuel, herbs, ornamental plants, tree seedlings, flowers) within the urban area and its periphery. The activity may be purposely for home consumption and/or for the urban market, and related small-scale processing and marketing activities (including street vending of fresh or prepared food and other products). In many places, urban agriculture is also closely linked with recycling and use of urban organic wastes and wastewater. Urban agriculture takes place on private, leased, or rented land in peri-urban areas, in backyards, on roof tops, on vacant public lands (such as vacant industrial or residential lots, roadsides), or on semi-public land such as school grounds.

More than 70 percent of the working population of sub-Sahara Africa depends on agriculture and related business for their livelihoods. While farming has traditionally been restricted to the rural area, farming within Nigerian cities is increasingly becoming an important economic activity among a section of the urban dwellers given the increasing number

of small garden and vegetable plots springing up in different parts of the country. This is because it serves both as a quick source of food thereby improving nutritional status as well as an employment opportunity for many urban dwellers. Besides, the potential for significant increase in food production can be exploited through the water resources that are available on the flood plains. Farming in Fadama areas is therefore, a major livelihood asset for urban dwellers. Fadamas are flood plains and low-lying areas underlined by shallow aquifers. Put in another form, Fadamas could be described as 'wetlands' in 'dry lands' or lowland around a river that flood or becomes wet when the river is high. The lands often have large deposits of organic matter and soils richer than the surrounding top lands. While these lands are relatively small compared with the overall available area, the Fadama lands have the potential for extended seasonal use and provide the opportunity for production diversification (Roger and Ingawa, 2004).

Leafy vegetables are an important feature of Nigerian's diet that a traditional meal without it is assumed to be incomplete. In developing countries, the consumption of vegetables is generally lower than the FAO recommendation of 75kg per year in habitant (206g per day per capita). In urban areas, where the village pattern is being replaced by a more sophisticated way of life, many people in the community cannot produce their own vegetables and a few part – time growers devote their spare time to the production of their own supplies of exotic vegetables as a backyard, urban ad marginal farms.

METHODOLOGY

The study was conducted in Akinyele Local Government Area of Oyo State, Nigeria. The local government has a land area of 575 square kilometres and the climate supports the growth of both local and exotic vegetables such as cabbage, cucumber, lettuce. The study area is also characterised by bimodal type of rainfall; hence two growing seasons are recognised. Population of the study comprises of all persons cultivating vegetable in urban and peri-urban areas in the local government area. Snowball technique was used to select 100 respondents for the study.

This study made use of data from both primary and secondary sources. Data were collected from the respondents using well structured questionnaires, Focused Group Discussion (FGD) and key informant interview procedures were also conducted to collect qualitative data for the study.

The data collected were described using frequencies and percentages while cost and return analysis was used to calculate the profitability level of vegetable production by considering the total cost of production and the total revenue generated. Multiple regression analysis was also used to establish the relationship between the total output and the input factors.

Profit made is the differences between total revenue and total cost; $\pi = TR - TC$

Where

π=Profit

TR=Total Revenue in Naira/ha

TC=Total Cost in N/ha

TC=Total Fixed Cost (TFC) + Total Variable Cost (TVC)

TC=TFC+TVC

The various profitability ratios computed from the above analysis includes: benefit-cost ratio, rate of return, expenses structure ratio, gross margin ratio and gross revenue ratio.

Multiple regression analysis was used to determine the relationship between vegetable output and the inputs used. The implicit function is,

Y=f(X1, X2,X3, X4,X5, X6,X7,X8,μ)

Where,

Y=Vegetable output value (Kg)

X1 = Farm Size (ha)

X2 =Cost of Planting materials (Seeds)

X3= Fertilizer (Kg)

X4 =Herbicide (Kg)

X5 =Insecticide (Kg)

X6= Cost of Hired labour (Man-days)

X7= Cost of Family labour (Man-days)

X8= Cost of Farm implements

μ= Error term

RESULTS AND DISCUSSION

Table 1 shows the cost and returns of exotic vegetable production. The total revenue generated from the sales of the produce for a typical farmer was N829,489.00 while the total fixed and variable inputs cost amounted to N163,998.85k to give a profit of N665,490.15. This shows that exotic vegetable farmers under Fadama system actually made profit.

Table 1: Average cost and return for exotic vegetable farmers/ha

Items	**Amount (Naira)**
Planting material	6977.04
Fertilizer	16472.00
Herbicide	7870.59
Insecticide	10192.65
Labour	102325.00
Total Variable Cost (TVC)	143837.28
Land rent	7630.00
Hoe	2066.17
Cutlass	1565.83
Basket	1593.50
Pumping machine	5339.34
Watering can	1966.74
Total Fixed Cost (TFC)	20161.57
Total Cost (TC = TVC + TFC)	163998.85
Cucumber	127726.92
Carrot	185345.28
Lettuce	135316.67
Cabbage	211160.87
Water Melon	169939.26
Total Revenue (TR)	829489.00
Net Farm Income (NFI = TR - TC)	665490.15

Table 2 shows the percentage of the total cost allocated to fixed and variable inputs. For a potential farmer that wants to invest in exotic vegetable production under the Fadama system, 56.31 percent of the total cost of production would be expended on hired labour, 4.25 percent on planting materials (seeds), 10.04 percent on fertilizer, 4.80 percent on herbicides and 6.22 percent on insecticides. For the fixed cost items, 4.65 percent would be expended on land, 1.26 percent on hoe, 0.95 percent on cutlass, 0.97 percent on baskets, 1.20 percent on watering can and the highest portion of the variable cost items of 9.35 would be expended on water pumping machines from the total cost to be incurred from the exotic vegetable production.

Table 2: Cost Structure for a typical exotic vegetable farmer under Fadama System.

Cost items	Amount (N)	% of TFC	% of TVC	% of TC
Fixed cost				
Land	3815	18.92		2.325
Hoe	1033.085	5.00		0.63
Cutlass	782.915	3.89		0.475
Basket	76.75	3.95		0.485
Pumping machine	2669.67	13.24		4.675
Watering can	983.37	4.875		0.6
Sub total	10080.785	50.00		9.19
Variable cost				
Planting material (seed)	3488.52		2.425	2.125
Fertiliser	8236		5.725	5.02
Herbicides	3935.295		2.735	2.4
Insecticides	5096.325		3.545	3.11
Labour	51162.5		35.565	28.155
Sub total	71918.64		50	40.81
Over all total	81999.425			50

Table 3 gives the summary of the regression analysis. The lead equation was the linear regression model in which the sign of the coefficients followed a priori expectations. The F-statistic of 29.02 was significant at 1% level of significance, meaning that all the explanatory variables put together explained the variability of Y.

The lead equation is given below:

$$Y = 15167.6 + 199364.9^{*}X_1 + 3.627X_2$$
$$(6.77) \quad (0.81)$$
$$+ 348.947^{***}X_3 + 177.224X_4$$
$$(1.74) \quad (0.76)$$
$$+317.908^{***}X_5 + 1071.55^{*}X_6 +$$
$$(7.25) \quad (0.22)$$
$$683.921X_7 + 6625.795X_8$$
$$(1.86) \quad (1.18)$$

From the regression above, four explanatory variables were significant at different levels. These include farm size (X1), fertilizer (X3), insecticides (X5) and labour (X6). The farm size (X1) was significant at 1% level and had a positive relationship with the dependent variable (exotic vegetable production). This means that if the farm size increases, the output of vegetable production will also increase. Also, the quantity of fertilizer (X3), the quantity of insecticide used (X5) and the labour employed (X6) were significant at 10, 10 and 1% levels respectively. All these variables were positively related to the exotic vegetable production. Therefore, any increase in these variables will equally translate directly into an increase in the output of vegetable produced.

Table 3: Summary of Multiple Regressions Analysis

Model	Linear Equation	Semi-Log Equation	Double-Log Equation
X0	4550.28	32105.34	4.46
X1	199364.9*	1.38100.4*	0.29279.2**
	(6.77)	(4.98)	(2.57)
X2	3.627	-12992.25	-0.081
	(0.81)	(-0.80)	(-1.21)
X3	348.947***	-28293.95	-0.011
	(1.74)	(-1.08)	(-0.10)
X4	177.224	11401.99	0.069
	(0.76)	(0.41)	(0.61)
X5	317.908***	18073.61	0.018
	(1.86)	(0.64)	(0.16)
X6	1071.55*	126596.5*	0.369*
	(7.25)	(4.69)	(3.32)
X7	683.921	-25389.6	0.961
	(0.22)	(-0.15)	(-1.42)
X8	6625.795	8249.29***	0.325***
	(1.18)	(1.77)	(1.69)
R^2	0.71	0.60	0.34
Adj.R^2	0.69	0.57	0.28
F- stat	29.02*	17.78*	6.01*

* Significant at 1% level of significance ** Significant at 5% level of significance
*** Significant at 10% level of significance

CONCLUSION

Exotic vegetable production is a profitable business and it has provided a means of livelihood to the operators of the business. Profit however can be maximised if government intervenes in the area of extension services, importation of improved exotic vegetable seeds and provision of adequate incentives to the exotic vegetable growers. This would increase their output level and also contribute significantly to food security in the nation as a whole and the urban areas in particular.

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