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Profitability of ornamental plant business in Akwa Ibom State, Nigeria

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Abstract

Ornamental plant business contributes to income generation and socio-economic development of a country, but due to lack of information on its cost-benefit analysis, it has not been adopted as an applicable business venture in Akwa Ibom State, Nigeria. For this reason, this study, examined profitability of ornamental plant businesses in the state. Forty-two ornamental plant nursery businesses were identified from six Local Government Areas, namely Eket, Oron, Ikot Ekpene, Abak, Uyo and Etinan, which were purposively selected from the 31 Local Government Areas in the State. Data were generated from these businesses via pre-tested questionnaire, oral interviews and direct observation, and analyzed using budgetary technique and multiple regressions. The results showed that the business was profitable with mean return of $369,73 (₦131.622,62) per annum to labor and management. Nursery size, polypots, seed/cuttings and fertilizer/manure had significant positive effects on revenue ($p< 0.01$) and ($p<0.10$) respectively, while rent had significant negative effect on revenue ($p<0.05$). About 88.66 % of variations in the receipts from the business were explained by the variable used in the model. It is therefore recommended that people should be educated on the profitability potential of businesses in order to encourage young school leavers to go into the business thereby sustaining livelihood and also reduce youth unemployment currently experienced in the country.

Keywords: Ornamental plant business, Profitability, Returns to Labour and Management (RLM), Nigeria

Özet

Süs bitkileri ticareti ülkenin sosyo-ekonomik gelişimi ve alternatif gelir olanakları üretme açısından önemli bir potansiyel taşımasına rağmen, bu alanda fayda-maliyet analizinin yeterince yapılmamış olması nedeniyle Akwa Ibom eyaletinde (Nijerya) uygulanabilir bir girişim olarak kabul görmemiştir. Bu nedenle, bu çalışmada, süs bitkisi ticareti ile ilgili işletmelerin kârlılığı incelenmiştir. Eyalette bulunan 31 yerel hükümete ait alanda yer alan ve Eket, Oron, Ikot Ekpene, Abak, Uyo ve Etinan'dan oluşan 6 merkezdeki 42 işletme araştırmaya dahil edilmiştir.. Araştırmada kullanılan veriler, anket, sözel mülakatlar ve doğrudan gözlem yoluyla toplanmış ve Bütçe Tekniği ve Çoklu Regresyon Modeli ile analiz edilmiştir. Elde edilen sonuçlara göre, bu iş sahasının iş gücü ve idarî yatırımının yıllık olarak 369.73$'lık bir getirisi olduğu tespit edilmiştir. Fidanlıkların büyüklüğü, çoklu saksılı yetiştiricilik, tohum/budama ve gübrelemenin gelire sırasıyla ($p<0.01$) ve ($p<0.10$) düzeyinde olumlu katkısı olduğu, kiranın ise olumsuz etkisi olduğu ($p<0.05$) görülmüştür. Değişimlerin %88.66'sı, modelde kullanılan değişkenlerle açıklanabilmiştir. Sonuç olarak, okulunu bırakan genç nüfusun bu iş sahasının kârlılığı hakkında eğitilmesinin hem sosyal kalkınmaya hizmet edeceği hem de genç işsizliğin önünü keseceği öngörülmüştür.

Anahtar kelimeler: Süs bitkisi ticareti, kârlılık, işçilik ve yönetim kârlılığı, Nijerya.

Introduction

Ornamental plants are important aesthetically and economically. Aesthetically, they enhance beauty of surroundings. They are used as decorative materials in the construction of lawns, parks, plaza and various kinds of gardens (Imanishi *et al.*, 1992). Production of ornamental plants became commercially important in the beginning of the 20th century. However, it had begun as an important line of business especially in developed countries (in Holland, the United States of America and Japan) before Second World War, and then in some developing countries such as Colombia, Kenya and Israel (DPT, 2001; Doldur, 2008). Today, in many countries, production of ornamental plants has become an effective commercial sector contributing to economy (Middleton, 2011). The industry has contributed to foreign exchange earnings of many countries. For instance, in 2006, the floriculture items sold at all rated outlets in the United States of America were worth $20.8 billion (Society of American Florists, 2006). Recently in Nigeria, beautification of the environment with ornamental plants, particularly around houses, schools, hospitals, hotels and parks, is spreading rapidly (Salawu and Darabidan, 2010). Moreover, many people in the country are now engaging in its production and marketing as a profitable agricultural venture (Fawusi, 1996; Adeoye, *et al.* 1996; Ezedinma, *et al.* 1999; Bankole, 2002; Oseni, 2004; Babatola, 2004; Nelson, 2015).

The contribution of small-scale private plant nursery business (which is a self-employment business) in economic development both to the individual and to the nation's economy cannot be overemphasized. These business ventures are highly profitable due to the short time between production and sale of most of the plants involved (Aiyeloja and Larinde, 2006; Babalola, 2008; Nelson, 2015). Mailumo *et al.* (2006) in their socio-economic analysis of tree seedling production in nurseries in Abuja, Nigeria found the business profitable with the owners realizing an average profit of $778,39 (₦277,108) annually from an average nursery size of 0.2 ha. This study, therefore, examined ornamental plants business in Akwa Ibom State, Nigeria to ascertain its profitability and the determinants.

Methodology

The study was conducted in Akwa Ibom State, Nigeria. The State is located in the south-south geo-political zone of Nigeria. It lies between latitudes 4º33' and 5º35' N and longitudes 7º35' and 8º25' E. It is located within the tropical rainforest zone (NPC, 2007). The state has common borders with Cross River State to the East, Abia State to the North, Rivers State to the West, and the Atlantic Ocean to the South (AKADEP, 2006). The climate of the state is characterized by two seasons – the wet season, which lasts for about 8 months (mid-March to November), and the dry season (December to early-March). The total annual average rainfall is about 2500 mm (Ekanem, 2010). Temperatures are uniformly high throughout the year with slight variation between 26ºC and 28ºC (AKS, 1989). The soil types found in Akwa Ibom State are associated with one another in an intricate manner, but are very similar (Peters *et al*., 1994).

The sampling technique involved a purposive selection of six local government areas in Akwa Ibom State namely: Eket, Oron, Ikot Ekpene, Abak, Uyo and Etinan. These local government areas were selected because they were the major urban centers in the state where infrastructural projects were on-going, and ornamental plant businesses were found there. According to Abegunde *et al.* (2009), floricultural plants production was mostly restricted to urban centers. Reconnaissance survey was undertaken to identify sites of existing ornamental plants nursery businesses within the six study areas. The target population was made up from ornamental plants nursery businesses in the state. Data for the study were obtained using structured questionnaire, oral interviews and direct observations. Forty-two (42) nursery businesses were identified, and formed the sample size.

Budgetary technique and multiple regression analyses were used to determine the costs and returns to ornamental plants nursery business and to identify the factors affecting receipts from the business. For this purpose, the nursery budgets were analyzed to determine the structure of costs and returns to labour and management (RLM), as explained by Fakayode *et al* (2008). First, Gross Margin (GM) was estimated using Equation 1.

$$GM = GVP - TVC \quad \text{Eqn.1}$$

Where,

GM = Gross Margin;

GVP = Gross Value of Production, obtained by adding the revenue from direct sales of ornamental plants at the prevailing market prices ($);

TVC = Total Variable Cost, that is costs of top soil, manure/fertilizer, seeds/cuttings, paid labour, water, polypots, agro-chemicals, among other expenses including imputed cost of non-paid labour (family labour).

After calculated GM, Business' returns to labour and management were estimated using Equations 2, 3 and 4, as described by Fakayode *et al* (2008) and Muhammad-Lawal *et al* (2012).

$$RLM = GM - (R + D + R_1 + Lu) \quad \text{Eqn. 2}$$

$$TFC = Rent + D + R_1 + Lu = \quad \text{Eqn. 3}$$

$$RLM = GM - TFC \quad \text{Eqn. 4}$$

Where,

RLM = return to business' labour and management;

GM = gross margin;

R = imputed interest on capital;

R_l = imputed rent on land;

D = depreciation charge determined using the straight line method with no salvage value at the end of the useful life for items like watering cans, hoes, cutlasses, shovels, secateurs, pruning knives, rakes and paid rent;

Lu = imputed cost of non-paid labour (family labour);

TFC = Total Fixed Cost. Inputs such as land and family labour were not purchased and therefore the costs were imputed.

Ordinary Least Square (OLS), double log, semi-log and exponential multiple regression analyses were employed to identify the factors affecting receipts from ornamental plant nursery business. They were also used to measure the amount of variability of the dependent variable that could be explained by the independent variables. The regression equations tried were expressed as Equations 5, 6, 7 and 8, here expressed in their respective explicit forms:

OLS regression model

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + - - - + b_9X_9 + \mu \quad \text{Eqn. 5}$$

Double Log Regression model

$$LogY = a + b_1 \log X_1 + b_2 \log X_2 + - - - b_9 \log X_9 + \mu \quad - \quad - \quad \text{Eqn. 6}$$

Semi-Log Regression model

$$Y = a + b_1 \log X_1 + b_2 \log X_2 + - - - - b_9 \log X_9 + \mu \quad - \quad - \quad \text{Eqn. 7}$$

Exponential Regression model

$$\text{Log}_\mu Y = \log_\mu a + b_1 X_1 + b_2 X_2 + - - - - b_9 X_9 \quad - \quad - \quad - \quad \text{Eqn. 8;}$$

Where,
Y= total revenue from the sales of ornamental plants ($);
a = constant; bi, where i =1, 2...9 were the regression coefficients of X_i variable.
X_1 = marital status (married, single, widowed and divorced)
X_2 = educational level (number of years spent in school)
X_3 = training in business was coded as 0= No, 1= Yes
X_4 = cost of seeds/cuttings ($);
X_5 = cost of polypots ($);
X_6 = nursery size (m^2);
X_7 = manure/fertilizer (kg);
X_8 = labour in man days;
X_9 = Rent paid ($); and
μ = factors that were not adequately accounted for but contributed to total revenue.
Log = natural logarithm

The *a priori* expectations of the variables X_1 to X_8 were that a unit increase in any input would have positive and significant effect (increase) on output, in terms of revenue. On the other hand, a unit increase X_9 would have a negative effect on revenue.

Results and Discussions

Costs and returns structure of ornamental plants production

The contribution of floriculture to the livelihood of the ornamental plant producers as obtained using the budgetary technique, is summarized in Table 1, which shows that the average total revenue generated from the sales of produce was $896.20/annum, with an average total variable cost of $342.76/annum and gross margin of $553.44/annum. The mean estimated total fixed cost incurred by the respondents in the production of ornamental plant nursery in the study area was $183.71/annum. Hence, the return to labour and management (RLM) was estimated to be $369.72 /annum (Table 1). This result implies that on the average, floricultural plant production in the study area is profitable and is a reliable means of livelihood for the people. This is in accordance with Fakayode *et al*. (2008) who reported the business was profitable in Nigeria. However, the RLM recorded in the study was lower than the $428.70 recorded by Fakayode *et al*. (2008) for Ilorin metropolis, Nigeria.

Table 1: Summary of costs and returns structure of ornamental plants production

Variables	Total ($annum^{-1})	Mean/Nursery ($annum^{-1})
Gross Margin (GM)		
Total Annual Revenue (TAR)	37,640.45	896.20
Total Variable Cost (TVC)	14,396.07	342.76
Total Gross Margin (TAR - TVC)	23,244.38	553.44
Return to Labour and Management (RLM) ($)		
Rent	4,421.35	105.27
Total Depreciation Cost (TDC)	384.41	9.15
Imputed Rent (R_1)	382.02	9.10
Imputed Labour (L_u)	2,528.09	60.19
TFC = (Rent+TDC+R_I+L_U)	7,715.87	183.71
Gross Margin (TAR - TVC)	23,244.38	553.44
Total RLM = GM - TFC	15,528.51	369.72

Regression analysis and predictors of ornamental plant nursery

As showed in Table 2, the Ordinary Least Square (OLS) model was selected as the model of best fit because it had the highest number of significant variables with appropriate theoretically expected signs and the highest value of the coefficient of multiple determination (R^2). The R^2 value was 0.8066, indicating that the regressors included in the model explained about 80.66 % of the variations in income among the ornamental plant producers. The F-Statistic of 14.82 was highly significant at $p < 0.01$ indicating that the regressors included in the model impacted significantly on the total revenue among the producers. Marital status (X_1), education level (X_2), training in the business (X_3) and labour (X_8) were not significant (Table 2).

The coefficient for the seeds/cutting variable (X_4) was positive (2.650) and significant ($p < 0.10$). The variable conformed to the *a priori* expectation. This implied that an increase in the quantity of seeds/cuttings used, every other variable held constant, would result in an increase in the output and hence revenue of the business. According to Zakaria *et al.* (2009), seeds are of immense biological and economic importance as both artificial and natural regeneration programmes start with them. They also exercise a profound influence on the success or failure in plant regeneration. In the ornamental nursery, it is the vital input where the investment in the business is made (Badmus and Yekinni, 2011; Sadiq *et al.*, 2013; Nelson, 2015).

The coefficient for polypots (X_5) was positive (12.915), significant ($p < 0.01$) and in conformity with *a priori* expectation that increase in number of polypots used in raising nursery output would lead to a corresponding increase in the output (revenue) of the nursery business. Polypots were used for seed germination or displayed for marketing. Hence, considering the fact that majority of the nursery operators operated their nurseries on small plots, and preferred using polypots in raising their planting stock as they could contain more seedlings and occupy less space, the result would lead to increase in revenue.

Nursery size (X_6) with a positive coefficient (337.630) and significance at ($p < 0.01$) conformed to the *a priori* expectation. The positive sign implied that an increase in nursery size would lead to an increase in output of ornamental plant business. This observation agreed with the findings of Ofuoku *et al.* (2006) and Muhammad-Lawal *et al.* (2012) that nursery size had a positive effect on output.

The coefficient for manure/fertilizer (X_7) utilization was positive (4092.568) and significant ($p < 0.05$), and in conformity with *a priori* expectation that increase in manure/fertilizer utilization would increase nursery output. This would further translate to increased income of the nursery operator. This was in line with earlier report by Ofuoku *et al.* (2006) and Emuh and Ofuoku (2011) that increase in the utilization of manure/fertilizer in crop production would result in higher production output because the plant would be healthy to attract higher bidding price. However, according to Muhammad-Lawal *et al.* (2012), the total revenue drops as excess fertilizer application becomes toxic to the plants and thus reduces productivity of the plant and consequently the total revenue.

The coefficient for rent (X_9) was negative (-4.175) but significant ($p < 0.05$). This was also in line with the *a priori* expectation. The huge amount spent on rent was as a result of the location of the nursery, mainly along major roads which adversely affected revenue, despite the small sizes of the nursery (Udo *et al.*, 2015).

Table 2: Regression analysis and predictors of ornamental plant output

Variable	OLS ++	Exponential	Double-log	Semi-log
Constant	-181583.0	11.403	2.891	-3793793.00
	(-3.328)***	(57.198)***	(1.891)*	(-7.675)***
Educational Status	-31.292.800	-0.148	-0.073	-3484.15
	(-0.970)	(-1.257)	(-0.608)	(-0.090)
Nursery Size	337.630	0.001	0.408	177252.10
	(3.169)***	(2.064)**	(2.448)**	(3.287)***
Labour	24.208	-0.001	-0.037	20598.85
	(0.088)	(-1.047)	(-0.410)	(0.707)
Fertilizer/Manure	4.092.568	0.009	0.111	70080.05
	(2.062)**	-1.305	(0.826)	-1.620
Marital Status	49.923.040	0.178	0.140	31916.35
	-1.310	-1.282	-1.040	(0.731)
Poly Pots	12.915	3.00E-05	0.280	106792.90
	(3.262)***	(2.075)**	(2.233)**	(2.638)**
Rent	-4.175	7.93E-06	0.131	-72053.67
	(-2.432)**	-1.265	-1.154	(-1.957)*
Seeds/ Cuttings	2.650	6.64E-06	0.329	114746.30
	(1.902)*	-1.305	(2.863)***	(3.088)***
Training in Business	-10686.37	-0.088	-0.094	-8639.73
	(-0.320)	(-0.720)	(-0.778)	(-0.222)
R-square	0.8066	0.6113	0.6161	0.7334
Adj. R-square	0.7522	0.5020	0.5082	0.6584
F-statistics	14.8269***	5.5924***	5.7065***	9.7787***

***, ** and * represent 1%, 5% and 10% significance levels respectively. Figures in parenthesis are t-ratios.
++ = lead model

Conclusion and Recommendation

Ornamental plant business has lots of potentials economically, environmentally and socially in the development of a country. The result of this study has showed that ornamental plant production in Akwa Ibom State to be a profitable business with an average return of $369.73 /annum to labour and management. With the high level of environmental modernization in urban areas, coupled with the increasing knowledge on the need for ornamental plants used by individuals and landscape architects for landscaping and beautification of their houses, major roads, hotels, and schools, among others, ornamental plant business would become one of the preferred businesses in the future. This would improve the livelihood status of the people by creating employment opportunities in the face of rising unemployment challenges in the state. However, to improve on the level of profitability, businesses need to increase their nursery sizes and hence the number of polypots in view of the highly significant impacts of these factors on output and revenue.

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