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Viability of Floricultural Plants Nursery Business in Southeast, Nigeria

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Abstract:*The sustainability of the environment depends on how all the natural and artificial resources are being utilized. The study on economic analysis of floricultural plant production in Southeast, Nigeria described the socioeconomic characteristics of the producers, identified the different floricultural plant species available in the area, the profit from the production, determined the factors influencing revenue generation from the business, as well as examined the constraints to the production of floricultural plant in the study area. Using the Multi-stage sampling method, data on 100 respondents was described and analysed using descriptive statistics, budgetary technique and multiple regression analysis. The study found that married male producers dominated the enterprise, with an average age of 36 years, the majority were literate and had a mean farm size of 0.23. The species available to the farmers in the study area were Dwarf Ixora, Crown of Thorns, Thuja species, and Murraya/orange amongst others. The floricultural business was profitable with a profitability ratio of 2.11, a return on investment ratio of 1.16 and a profit of USD1,002.03 heavily affected by the cost of seeds and polythene bags. The business was constrained by inadequate capital, and high-cost fertilizer/lack of fertilizer among others. Results of the paired sample t-test showed significant differences between the revenue generated from the different floricultural plants and some socio-economic characteristics that influenced the profit. Thus, the study recommends that the cost of seeds and other production inputs be subsidized and security beefed up to curb theft.*

Keywords: *Business, Floriculture, Nursery*

INTRODUCTION

Floricultural plants are one of the horticultural products that are currently starting to be in great demand by the public. Hence, Ornamental plants include all plants that are in the forms of herbs, vines, shrubs or trees which people consciously plant as components of gardens, home gardens, room decorations, ceremonies, components of make-up or clothing and components of flower bouquet (Geofani, 2020).

Floricultural Crops can be referred to as Garden Plants, Potted Herbaceous Perennials, Potted Flowering Plants, Foliage Plants and Cut Flowers (USDA Floriculture Crops, 2018). Plants from almost more than 2,000 genera are used as ornamental plants, which are divided into floriculture

crops, ornamental shrubs, trees, grasses, and bamboos as well as ornamental aquatic plants. There are Flowering ornamental plants which have Annual and Perennial flowering plants. Examples include; Tulips, Irises, Hollyhocks, Primroses, Lavender, Jasmine, etc (Warren, 2020). Another type of Floriculture Plants are the Aquatic plant species and they include; Arrowhead (*Sagittaria spp*.), Cattail (*Typha spp*.), Cardinal flower (*Lobelia spp*.), Marsh marigold (*Caltha palustris*), Parrot's feather (*Myriophyllum aquatica*), Water iris (*Iris laevigata*) (Warren, 2020).

Floricultural plants are being employed in decoration of lawns, parks, plaza and various kinds of gardens and in some cases, dressing materials. The history of using Ornamental Plants had been traced back to the ancient Roman and Greek Civilizations, for their gardening and decorating of the Emperor Palaces to induce mental satisfaction (Akintoye, Adejumo, Aina and Adebayo 2018). For the purpose of some social functions or activities, the lilies are usually associated with the celebration of Easter and roses are majorly associated with valentine period (Adeduntan, 2015).

There is an increasing preference amongst the younger generation for white collar jobs rather than taking up jobs in the agricultural sector. This may however be connected to the fact that very little is known about the profitable potentials of some of the agricultural enterprises including Floriculture.

METHODOLOGY

The study was conducted in five States in the South-east geopolitical zone namely Abia, Anambra, Ebonyi, Enugu, and Imo. The area spreads over a total area of 26,982.67km^2, representing 8.5% of the nation's total land area with a total population of 16,395,555 million (National Population Commission (NPC), 2006). Mixed farming (crop production and livestock rearing) system is the major source of livelihood for the majority of the population in the area. Crop production is dominated by rain fed agriculture while irrigation is practiced on small scale level. The major livestock reared in the area are goats, sheep, poultry, pigs, and cattle.

Sampling technique and sample size

The study employed three-stage random sampling method to select sample respondents. Multi-stage sampling method was used to select respondents for the study. In stage I, three states (Anambra, Imo and Enugu) were purposively selected from the five States in South East, Nigeria. The basis for selection was the predominance of floricultural plants evidenced from preliminary study and the familiarity of the researcher with terrains of the selected states. Stage II involved purposive selection of two LGAs from each State (six LGAs), and two major flower stands from each of the selected LGAs (twelve flower stands). Finally, simple random method was used to select eight producers from ten flower stands, then 10 producers from two of the twelve flower stands giving a total of 100 respondents. Primary data for the study was collected using questionnaire. The questionnaires were administered to respondents getting information on their socio-economic characteristics of the respondents, production variables and challenges faced by the respondents.

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the floricultural farmers

The result of the socioeconomic characteristics of the floricultural farmers are presented in Table 1. Sex: the Table shows that majority (57.0%) of the respondents are male, while the rest 43.0% are female. These findings revealed that male respondents dominate floricultural production in the study area which is in support with Akintoye, Layade, Aina, Adebayo, Shokalu, Olatunji, Akinwunmi, Oyadeji, Igberaese, Fade-Aluko, James, and Okoyo (2018) who also reported about 73% of male engaged in floricultural plant production in South West Nigeria. These findings were also in line with Adedutan (2015) who reported about 86% male engaged in ornamental nursery business in Akure Metropolis, a part of Southwestern Nigeria. The study revealed that many (38.0%) of the farmers are 26 – 35 years, while the remaining 25.0% are $\leq$ 21 years, 21.0% are 36 – 45 years, 7.0% are 56 – 65 years, 6.0% are 46 – 55 years, and 3.0% are above 65 years. The average age of the respondent was found as 36 years. The implication of this result is that the farmers are young and in their active farm age. They are still vibrant to try new things that may improve their production. The result is almost similar to Akintoye, Idowu, Olufolaji, Adebayo, Olatunji, Aina and Shokalu (2011) who stated that a good percentage of florists were middle-aged. On Marital status, the study revealed that majority (59.0%) of the farmers are married, while the rest 41.0% are single. This finding revealed that married farmers dominated floricultural production in the study area.

Level of education: the Table shows that greater proportion (32.0%) of the respondents attended secondary school, 31.0% had tertiary education, 26.0% had primary education, and 11.0% of the respondents did not attend any school. The average years spent in formal education was 9 years. This shows that majority of the farmers attended secondary school. The table also shows that many (29.0%) of the farmers have 11 – 15 years farming experience, 23.0% have 6 – 10 years farming experience, 21.0% have 1 – 5 years farming experience, 14.0% have above 20 years farming experience, and 13.0% have 16 – 20 years farming experience. The average farming experience was found as 13 years. This indicates that the farmers have been into floricultural production for more than a decade. They have gained enough management skills to improve their production. The combination of education and experience could make the producer to be efficient in managing the business which could lead to increase in productivity, resulting in increase in income (Ahmadu & Oyoboh, 2017 and Ojo, 2002).

Household size: the study found that greater proportion (48.0%) of the respondents have 5 – 8 people in their household, while the remaining 41.0% have 1 – 4 people, and 11.0% have 9 – 12 people in their household. The average number of people per household was 5 people. The findings also showed that majority (88.0%) of the respondents had 0.10 – 0.30 ha, while the remaining 11.0% had 0.31 – 0.60 ha, and 1.0% had above 0.90 ha. The average farm size was 0.23 ha. This implies that floricultural farming is practice on a small scale in the study area. Also, greater proportion (38.0%) of the respondents are farmers, while the remaining 27.0% are civil servant, 26.0% are traders, and 9.0% are artisans. Scale of production: the study revealed that many (59.0%) of the respondents produce at small scale level, while the remaining 33.0% produce at medium scale level, and 18.0% produce at large scale level. Cooperative membership: the study found that majority (65.0%) of the respondents are members of cooperative association, while

the rest 35.0% are not members. These findings show that floricultural plant producers organize themselves into a group to protect their interest.

Channels of sales: the Table revealed that greater proportion (47.0%) of the respondents sell to wholesalers, 28.0% sell to retailers, and 25.0% sell to final users of the plant. Access to credit: the study found that majority (74.0%) of the respondents does not have access to credit, while the rest 26.0% have access to formal credit. Improved access to credit will help the producers to upscale their production in the study area. Source of fund: the study revealed that 46.0% of the respondents sourced their fund from personal savings, 20.0% sourced their fund from informal money lenders, 13.0% source their fund from microfinance banks, 12.0% sourced their fund from cooperative society, and 9.0% sourced their fund from commercial banks. Fund availability will help the floricultural plant farmers to purchase production inputs at the right time.

Table 1: Socioeconomic Characteristics

Variables	Frequency	Percentage	Mean
Sex			
Female	43	43.0	
Male	57	57.0	
Age			
<= 25 years	25	25.0	
26 - 35 years	38	38.0	
36 - 45 years	21	21.0	36.0
46 - 55 years	6	6.0	
56 - 65 years	7	7.0	
above 65 years	3	3.0	
Marital status			
Single	41	41.0	
Married	59	59.0	
Level of education			
0 (No formal education)	11	11.0	
1 - 6 years (Primary education)	26	26.0	9
7 - 12 years (Secondary education)	32	32.0	
Above 12 years (Tertiary education)	31	31.0	
Farming experience			
1 - 5 years	21	21.0	
6 - 10 years	23	23.0	
11 - 15 years	29	29.0	
16 - 20 years	13	13.0	13
above 20 years	14	14.0	
Household size			
1 - 4 people	41	41.0	
5 - 8 people	48	48.0	5

9 - 12 people	11	11.0	
Farm size			
0.10 - 0.30 ha	88	88.0	
0.31 - 0.60 ha	11	11.0	0.23
0.61 - 0.90 ha	-	0.0	
above 0.90 ha	1	1.0	
Occupation			
Farming	38	38.0	
Trading	26	26.0	
Civil service	27	27.0	
Artisan	9	9.0	
Scale of production			
Small scale	59	59.0	
Medium scale	33	33.0	
Large scale	8	8.0	
Cooperative membership			
No	35	35.0	
Yes	65	65.0	
How to sell product			
Wholesaler	47	47.0	
Retailer	28	28.0	
Final consumers	25	25.0	
Credit access			
No	74	74.0	
Yes	26	26.0	
Source of fund			
Personal savings	46	46.0	
Commercial bank	9	9.0	
Informal money lenders	20	20.0	
Microfinance bank	13	13.0	
Cooperative society	12	12.0	

Source: Field Survey, 2024.

Floricultural species available in the study area

The species of floricultural plants produced by the respondents is presented in Table 2. The respondents reported multiple responses to the list of floricultural plants provided. The result was ranked in ascending order to prioritize the respondent's specie production. The study found that 73.0% produce Dwarf Ixora species, 68.0% produce Crown of thorns species, 65.0% produce Thuja species, 60.0% produce Murraya/orange jessamine species, and 57.0% produce other species such as Alocaria, White queen, Yellow fukus, Hibiscus etc. These findings bring to the

reality that the respondents have access to different types or variety of floricultural plant in the study area.

Table 2: Floricultural species available in the study area

Species	Frequency	Percentage	Ranking
Dwarf Ixora	73	73.0	1st
Crown of thorns	68	68.0	2nd
Thuja	65	65.0	3rd
Murraya/orange jessamine	60	60.0	4th
Others (Alocaria, White queen, Queen of the night, Hibiscus)	57	57.0	5th

Source: Field Survey, 2023.

Cost and Returns of Floricultural Plants

The profit from the production of floricultural plant is shown in Table 3. This revealed that the sales of different floricultural plants generated ₦579,019.64. The total variable cost spent in the production was ₦186,220.71 which represented 69.4% of the total cost. The total fixed cost spent in the production was ₦82,130.18 which represents 30.6% of the total cost. The implication is that the respondents spent ₦268,350.89 as the total cost used in production of the floricultural plant. The business returned a profit of ₦392,798.92, and net returns of ₦310,668.75. This was highly profitable with a profitability ratio of 2.11 and return on investment ratio of 1.16. This profitability ratio implies that the enterprise earned twice of its operational capital, whereas the return on investment ratio of 1.16 implies that the enterprise earns ₦1.16 in every ₦1 investment made in the production of floricultural plants. This corroborates with the findings of Akintoye *et al* (2018) which revealed that the rate of return on investment was 0.55 showing that the business was profitable.

Table 3: Cost and returns of floricultural plants

Items	Quantity	Price per flower pot (₦)	Amount (₦)	Percentage
Sales revenue:				
Crown	219.78	400.41	88,002.11	
Dwarf Ixora	277.99	307.79	85,562.54	
Thuja	246.08	519.04	127,725.36	
Orange	193.77	757.78	146,835.03	
Queen of the night	155.23	843.23	130,894.59	
Total revenue			**579,019.64**	

Variable cost				
Seed/cuttings	705.81	62.24	43,929.61	
Fertilizer	28	1544.04	43,233.12	
Labour	6.03	7025.57	42,364.19	
Polythene	875.57	32.12	28,123.31	
Pesticide	4.77	4034.56	19,244.85	
Water	2.19	4258.28	9,325.63	
TVC			**186,220.71**	69.4
Fixed cost (FC):				
Interest on loan			18,603.85	
Shovel	6.64	1527.77	10,144.39	
Cutlass	6.04	1747.19	10,553.03	
Wheelbarrow	2.2	7710.8	16,963.76	
Land rent	1.22	21200.9	25,865.15	
TFC			**82,130.18**	30.6
Total cost (TC)			**268,350.89**	
Gross margin			392,798.92	
Net returns			310,668.75	
Profitability ratio			2.11	
Return on investment (ROI)			1.16	

Source: Field Survey, 2024.

Factors Influencing Revenue Generation in Floricultural Plant

The factors influencing the revenue generated from floricultural plants in the study area is presented in Table 5. The result of the multiple regression analysis gave the linear function as the lead equation. Thus, the coefficient of multiple determinants (R^2) had a value of 0.669, which implies that 65.9% of variation in revenue from floricultural plant production was explained by the joint action of the cost of production factors, while the remaining 33.1% unexplained was as a result of error beyond the control of the farmers in the study area. Again, the F-statistics value of 31.28 significant at 1% level of probability is an indication that the entire model was significant and good fitted model. Thus, the assumption that the cost of production inputs does not influence revenue generation was rejected.

The coefficient of the cost of seed (3.630) was positive and significant at 1% level of probability. This implies that a unit increase in the cost of seed will cause 3.6% increase in revenue generated. The farmer's wants to increase the quantity of quality seed available to them not minding the cost. Again, the selling price of the plants seems to be after careful consideration of the actual cost incurred in the production process.

The coefficient of the cost of polythene (4.068) was positive and significant at 1% level of probability. This implies that a unit increase in the cost of polythene used will cause 4.06% increase in the volume of revenue generated. Polythene is a very important material in the

production of floricultural plant. This suggest while the farmers pay more attention to the material and not the cost.

Thus, it has been established that the factors influencing the revenue generation are cost of seed and cost of polythene.

Table 4: Factors influencing revenue generation in floricultural plant

	Linear		Exponential		Semi-log		Double-log	
Factors	**Coeff.**	**t-ratio**	**Coeff**	**t-ratio**	**Coeff.**	**t-ratio**	**.**	**t-ratio**
Intercept	340568.472	11.78	12.637	132.21	-757067.641	-4.43	10.256	21.08
Seed	3.630	8.88***	0.000	4.89***	115548.886	6.00***	0.206	3.75***
Fertilizer	0.036	0.10	0.000	-1.24	27444.147	1.71*	0.000	0.01
Labour	-0.119	-0.36	0.000	0.39	-7877.021	-0.81	0.021	0.78
Polythene	4.068	5.29***	0.000	3.28***	28747.834	1.29	0.082	1.30
Water	1.400	1.18	0.000	1.53	-4892.361	-1.36	0.003	0.30
Asset	0.834	0.15	0.000	0.68	-25794.987	-0.87	-0.014	-0.16
R^2	0.669		0.418		0.579		0.452	
F-statistics	31.276		11.152		21.349		12.787	
Obs.	100		100		100		100	

Notes: * means Significant at 10%, ** at 5%, and *** at 1% respectively

Source: Field Survey, 2024.

Constraints to Floricultural Plant Production

The constraints to the production of floricultural plant are presented in Table 5. The information about the constraints were ranked with a 3-point Likert-type rating scale with the value, 3 -very serious, 2-moderately serious, and 1 -not serious and 2.0 was set as the threshold mean. Thus, a variable with a mean score of 2.0 and above is assumed to be serious constraint. The grand mean of 2.03 implies that most of the variables were accepted constraints in floricultural plant production. Equally, the grand standard deviation value was 0.797 which is above threshold of 0.5, this implies that the response of the farmers varied greatly to inform a logical conclusion of the result. Furthermore, based on the nine items identified, five had a mean threshold of 2.0 which are: inadequate capital (2.08), high cost fertilizer/lack of fertilizer (2.25), incidence of pest and disease (2.16), lack of water source (2.15), and stealing (2.22). This result is in tandem with those of Fakayode, Adewumi, Rahji & Jolaiya (2011), Akintoye et al (2011) and Adeduntan (2015) who all reported that water unavailability, inadequate land, insufficient capital, pests and diseases attacks as problems facing floriculture business.

Table 5: Constraints to floricultural plant production

Constraints	Mean	Std. Dev.	Decision
Inadequate capital	2.08	0.774	Serious
Lack of improved seeds/cutting materials	1.89	0.709	Not serious
High cost fertilizer/lack of fertilizer	2.25	0.796	Serious

Poor/unavailability of market	1.94	0.708	Not serious
Incidence of pest and disease	2.16	0.861	Serious
Lack of suitable land	1.77	0.815	Not serious
Lack of water source	2.15	0.925	Serious
Stealing	2.22	0.773	Serious
multiple taxation	1.79	0.808	Not serious
Grand mean	**2.03**	**0.797**	**Serious**

Source: Field Survey, 2024.

Significant Relationship between the Socioeconomic Characteristics and Profit Generated from Floricultural Plants

The relationship between socioeconomic characteristics of the farmers and profit generated is presented in Table 7. Ordinary least square approach of linear regression was used to achieve this. The coefficient of multiple determinants had a value of 0.579 which implies that 57.9% of the variation in profit from floricultural plant was explained by the joint action of the respondent's socioeconomic characteristics, while the remaining 42.1% unexplained was as a result of the factors beyond the control of the farmers. Also, the F-statistics value of 13.74 was significant at 1% level of probability. This implies that the model was significant and good fitted model, thus the assumption that socioeconomic characteristics had no significant relationship with profit was rejected. The coefficients of age, farming experience and household size were positive and significant at 1% level of probability. This implies that a unit increase in the age, farming experience and household size of the farmers will increase profit realized from floricultural plant production. This result was expected in a priori expectation since older farmers have gained more experience in the business and as the farmers gain more experience, their production management skills grows which in turn affect their resource allocation ability to make better profit. Also, the findings showed that the household size was large enough to supply cheap family labour to save the amount spent on hired labour.

The coefficient of farm size was negative and significant at 5% level of probability. This implies that a unit increase in farm size of the respondents will cause reduction in profit from the plant. This implies that as the farm holding increases in the absence of mechanization, the farmers tend to employ non-productive labour force which will not cause proportionate increase in profit. The coefficient of cooperative membership was positive and significant at 10% level of probability. This implies that a unit increase in the number of respondents that are members of cooperative settings will increase their profit. This result was expected since being a member will increase their chances of practicing the principles of economic of scale, and protection of their members' right. The coefficient of access to credit was negative and significant at 5% level of probability. This implies that a unit increase in the number of respondents with no access to formal credit will reduce the profit generated from floricultural plants production. Having quality access to credit would have given the farmers opportunity to purchase the right farming inputs that will cause increase in production and profit. The study therefore, established that the socioeconomic variables that influenced profit in the study were age, farming experience, household size, farm size, cooperative membership, and access to credit.

Table 7: Significant relationship between the socioeconomic characteristics and profit generated from floricultural plants

Socioeconomic variables	Coefficients	Standard Error	t-Stat
Intercept	-99423.532	88154.487	-1.13
Sex	-26295.453	41133.513	-0.64
Age	86085.512	13207.826	6.52***
Marital status	29113.663	31213.040	0.93
Level of education	5601.478	3680.801	1.52
Farming experience	12258.519	2638.599	4.65***
Household size	24279.344	8879.308	2.73**
Farm size	-36811.137	15785.740	-2.33**
Cooperative membership	71150.055	43252.860	1.64*
Access to credit	-120070.995	50610.084	-2.37**
R^2	0.579		
F-statistics	13.74***		
Obs.	100		

* means Significant at 10%, ** at 5%, and *** at 1% respectively

Source: Field Survey, 2024.

Significant Difference in the Revenue generation of Floricultural Plant Species

The assumption that no significant difference between the revenue from the different floricultural plants is presented in table 8. Paired sample t-test was used to confirm this assumption which finally established that significant difference existed in the revenue generation as shown in table 4.7. This means that the null hypothesis two was rejected based on those significant values.

Table 8: Significant difference in the revenue generation of floricultural plant species

Flowers	Paired sample t-test Mean difference	Std. Deviation	t-value	Probability
Crown – Dwarf	8862.69	79956.041	1.108	0.270
Crown – Thuja	-48119.58	132706.899	-3.626***	0.000
Crown – Orange	-71285.11	170870.883	-4.172***	0.000
Crown – Queen	-44744.55	127941.075	-3.497***	0.001
Dwarf - Thuja	-56982.27	122199.067	-4.663***	0.000
Dwarf - Orange	-80147.8	172398.552	-4.649***	0.000
Dwarf - Queen	-53607.24	136969.238	-3.914***	0.000
Thuja - Orange	-23165.53	187884.299	-1.233	0.221
Thuja - Queen	3375.03	137430.546	0.246	0.807
Orange - Queen	26540.56	181649.776	1.461	0.147

(*,**,***) Significant at 10%, 5%, and 1% respectively

Source: Field Survey, 2024.

Conclusion and Policy implications

Often times, research have concentrated on analysis of food crops with little attention paid to floricultural plants in Southeastern Nigeria. The findings of the study showed that farmers involved in floricultural plant production in the study area are young with an average age of 36 years. The business earned twice its operational expenses since the study revealed a profit of ₦392,798.92, this suggests that floricultural plant production in the area is profitable. The study equally established that the cost of polythene and seeds influenced revenue generation from the business. The study also established that the socioeconomic variables that influence profit in the study are age, farming experience, household size, farm size, cooperative membership, and access to credit. The study came recommends that financial institutions should be encouraged by the Central Banks of Nigeria through some incentives to make production capital available to the farmers willing to access such funds. The cost of fertilizer and other production inputs should be subsidized by the government and farmers should engage the services of security personnel to tackle theft.

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