

Socio-Economic Importance of Tree Nursery Enterprises in Lagos State, Nigeria

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ABSTRACT: There is a growing interest to understand the role of tree nursery enterprises in Nigeria and the horn of Africa. Tree nursery enterprises, which are vital economic activities in major cities of Nigeria and particularly in the city of Lagos are not adequately studied and well documented. Therefore, this study seeks to fill a gap in understanding the socioeconomic importance and profitability potential of tree nursery enterprises. Multistage sampling technique with a 3-stage design was adopted in this study using aquantitative data collection techniques through the use of structured questionnaire administered to 120 nursery entrepreneurs. Data were analyzed using descriptive, inferential, and budgetary analysis. The result revealed that tree nursery entrepreneurs are literate, mostly male in their youthful age. Furthermore, the total annual revenue earned by the respondents was ¥1,712,222.22 with a mean annual net income of \$1,458,038.72 while the return per naira invested was \$5.71. This shows that tree nursery enterprise is profitable in the study area. However, most entrepreneurs were faced with shortage of land for establishments of tree nursery in the study area. Therefore, appropriate actions in reducing cost of land lease/purchase are recommended to encourage new entrepreneurs and strengthen the sector's development.

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Locally in Nigeria, people are gradually becoming aware of the need for a beautiful, manageable and sustainable environment. This has accounted for the recent increase in attention and patronage that the ornamental tree nursery enterprises have observed in Lagos state and Nigeria as a whole (Bota, 2008). A major feature of the urban landscape is now the establishment of tree nurseries, springing up mainly along major roads and highways, abandoned lands, along streets, foot paths and even in private homes. This has created viable employment opportunities and means of livelihood for quite a number people thus improving the national economy (Asiedu, et al., 2012).A tree nursery is a well-managed site, designed to produce seedlings grown under favorable conditions until they are ready for planting out in the field (Dedefoet al., 2017). A tree nursery can be an informal, small scaled arrangement or a large commercial enterprise (Roshetkoet al., 2010). Nurseries vary in size, facilities (supplies, tools, equipment, etc.), types of seedlings produced, and operations. They also differ significantly in quality and quantity of planting stocks produced. The tree nursery enterprise involves the production and marketing of various plants including trees, shrubs,

grasses, perennial and annual flowers, and fruit trees. In a tree nursery enterprise, plants are managed through various stages of production until they have grown to a saleable size (Larinde and Santus, 2014). Urbanization is a global phenomenon which is currently sweeping through developing countries like a wild fire. Many of such growing urban areas are in times are confronted with recent serious environmental challenges hence the need for tree planting in those areas is paramount. Lagos, Southwestern Nigeria, is one of the fast growing urban cities in the developing world which has been identified with resultant effects such as global warming, environmental degradation, poor urban health and low production of oxygen, compared to high quantity of carbon-dioxide generation from industries and automobiles among others (FAO, 2009). Therefore quite a number of strategies which include afforestation, urban agriculture, forest conservation and soft landscape planning among others have been put in place to improve urban green space for sustainable city ecological growth and development (Chaudhy and Gupta, 2009). Over the last two decades, the World Agroforestry Centre (ICRAF) has worked with hundreds of small-scale and large-scale tree

nursery enterprises across the world. For example, in Indonesia and the Philippines to promote land rehabilitation, forest conservation, livelihood enhancement through creating opportunities like nursery establishment. Seedlings produced in nurseries are always used by the nursery operators themselves. individuals, and community organizations, farmer groups, government agencies, and non-government organizations, corporate or private customers. Nurseries may often provide income generating opportunities for the operators and enhance the social capital, technical capacity and skills of (WAC, leadership communities 2010). According to Babalola, (2008) a small-scale tree nursery is a self-employment business that can contribute to income generation and socio-economic development of the state but it has not been embraced because little or no information exists on costs and returns from the investment. However, tree nursery enterprises are beneficial because of the inherent financial gains, and the ecological benefits they confer. Tree plants provide revenue and income to Government and the people. Ecologically, they minimize disasters like soil erosion, environmental degradation, wind effects, and watershed obstructions (Frigeriet al., 2017). Therefore, this study was conducted to examine the socio-economic importance of tree seedlings in nursery enterprises in Lagos metropolis, Nigeria.

MATERIALS AND METHODS

Study Area: This study was carried out in the metropolitan areas of Lagos States. Lagos States has a total area of 3,577 km² about 22 per cent of which is water. The Lagos metropolitan area is comprised of sixteen Local Government Areas (LGAs), including Amuwo-Odofin, Ojo, Ajeromi-Ifelodun, Agege, Alimosho, Ifako-Ijaiye, Ikeja,Kosofe, Oshodi-Isolo, Lagos Island, Apapa, Eti-Osa, Lagos Somolu. Mainland, Mushin, and Surulere. It lies within the geographical coordinate of $3.1^{\circ}E$ to $3.4^{\circ}E$ longitudes and $6.5^{\circ} N$ to $6.8^{\circ} N$ latitude, south-western, Nigeria (Soladove and Oromakinde, 2013; Nkwunonwo, et al., 2016). The metropolis is regarded as one of the fastest growing cities in Africa and Nigeria's commercial nerve centre (Aluko, 2010). It is the most urbanized state in Nigeria with about 70% of the land area covered with towns and cities. (Olaleve, et al., 2015). The most disturbing aspects of the land-use changes in Lagos metropolis are the loss of virgin forests due to urbanization. Large hectares of mangrove swamps and other exotic vegetation have been lost to city development (Lagos State Ministry of Economic Planning and Budget, 2004). Vegetation and water cover have given way to an artificial urban landscape of concrete and tar (LURG, 2009).

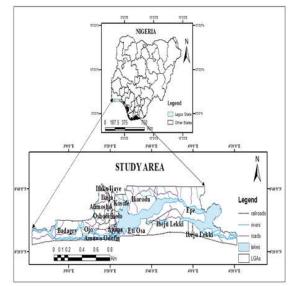


Fig 1: Map of Lagos State showing the study location: *Source*: Computed from Field Survey Data, 2017

Sampling Procedure and Sampling Size: A multistage sampling technique with a 3-stage design was used in selecting respondents for this study. The first stage involved the division of Lagos states into five major administrative areas (primary selection units). Each primary selection unit (administrative areas) represents a stratum. Secondly, the purposive selection of local government areas within the primary selection units with notable tree nursery enterprises was carried out. Finally, the third stage, respondents (nursery enterprises) was purposively selected from each local government area selected from the second stage given a total of 120 respondents selected for this study as shown in Table 1.

Table 1: Sampling Plan for the Study Area				
Division	LGAs	Number Of Respondents		
1. Ikeja	1. Agege	1		
5	2. Alimosho			
	IfakoIjaiye			
	4. Ikeja	30		
	5.Kosofe	3		
	6. Mushin	3		
	7. OshodiIsolo	20		
	8. Shomolu			
Lagos	9. Apapa	10		
	10 EtiOsa	25		
	 Lagos Island 	5		
	Lagos Mainland	8		
	13. Surulere	3		
Badagry	14. AjeromiIfelodun			
	15. AmuwoOdofin	13		
	16. Ojo			
	Badagry*			
4. Epe	18. IbejuLekki*			
	19. Epe*			
5. Ikorodu	20. Ikorodu*			
Total		120		

Source: Computed from field survey data, 2017

Data Collection: In this study, both primary and secondary data were required for assessment. Primary data was collected through the use of structured questionnaire administered to respondents. The questionnaire contained information on socioeconomic characteristics of the respondents, types and prices of trees seedlings on demand, revenue from the sales of ornamental trees and costs incurred of trees seedlings in the study area. Secondary data used for this study were obtained from relevant publications which include: text-books, bulletins, periodicals, journals, annual reports, seminar papers, unpublished materials of relevance to the study, report documents from different ministries and even internet search to obtain the most recent information on the subject matter.

Analytical Techniques: Data collected from this study was analyzed with both descriptive and inferential statistics such as mean, mode, standard deviation, frequencies, and logit estimate. Budgetary analytical tool was used to assess the costs and returns of forest nursery seedling production in the study area (Muhammad-Lawal, *et al.*, 2012) while profitability ratio was used to determine the Rate of Return on Investment (RORI).

Budgetary Analysis: The returns to farmer's labour and management is expressed in Naira per hectare (N/ha). Costs comprise both fixed and variable cost. Fixed Cost (FC) includes cost of depreciation charges on simple garden tools. While variable Cost (VC) include: cost of top soil, manure, seed/cuttings, agrochemical, labour, land rent and labour. Returns are revenues that accrue from the sale of produce.Generally, profit will be determined by:

Gross Profit (GP) = TR—TVC ... (1)

Where; $TR = Total Revenue (\aleph)$, is given by Py^*Y ; Py is the price/unit of the product, Y = Quantity/Output, TVC = Total Variable Cost

Net Profit (NP) = $GP - TFC \dots (2)$

Where; GP = Gross Profit; TFC = Total Fixed Cost; Total Cost (TC) = TVC + TFC ... (3)

Profitability Ratio: Profitability ratio was adapted in analysing economic variables like Gross Income (GI), Net Income (NI) and Rate of Return on Investment (RORI) (Tee and Labo, 2010; Olaleye, *et al.*, 2015). These tools are defined and computed as follows;

Net income (NI): This is defined as gross income (GI) less Gross cost (GC)

Mathematically:
$$NI = GI - GC...(4)$$

Where; GI = Total quantity of product sold over the period prevailing market price; GC = Total cost of production (cost of labour, fertilizer, water, transportation, polythene bags, topsoil).

Rate of return on investment (RORI): This depicts the level of profitability of an investment and is an important criterion in determining the choice of investment. It is determined using the following relationship:

$$\operatorname{RORI} = \frac{PROFIT \ X \ 100}{TOT AL \ COST} = \frac{TR - TC \ X \ 100}{TC} \dots \dots (5)$$

Where; Profit π , =TR — TC

$$TC = TVC + TFC$$

Logit Analysis: It is stated as

Y = Profitability status (1 = Profit, 0 = non-profit); W = Independent variables (i = 1 to 7)

RESULTS AND DISCUSSION

Socio-Economic *Characteristics* of Nurserv Entrepreneurs: The result of the socioeconomic distribution of respondents (Table 2) revealed that a high percentage of the tree nursery entrepreneurs in the study area were male (65%) while 35 % were female. The high involvement of male in tree nursery enterprise suggests that the business is not popular among the women in the study area.Larinde and Santus (2014) made similar observation in their study, male (78.9%) and female (21.1%), Adeduntan (2015) observed male (86%) and female (14%), Fakayodeet al. (2008) recorded male (85.2%) and female (14.8%)), Abegundeet al. (2009) recorded male (93.7%) and female (6.3%) while Khaguli (2007) observed men (87%) and (13%). This may be due to the fact that most of the operations performed in the nurseries are tedious and assumed to be men's work. The dominant age range among nursery entrepreneurs in the study area was between 30 and 39 years representing 36.7%. This implies that nursery enterprises are composed of mainly youths. This agrees with Muhammed-Lawalet al. (2012) who reported the dominant age range of 26-40 years for a similar study in Kwara State, Nigeria. Similarly, Asieduet al. (2012) reported that young and agile people of between 20-49 years make up 75% of the respondent in his study of the nursery industry in Ghana. Olaleyeet al., (2015) reported in a similar study carried out in Lagos that the entire horticulturist

are within the productive age, with about three-quarter (75%) within the age bracket of 20 and 39 years. The results of studies conducted in Eldoret Municipality (Kenya) also correspond with the finding of this study that young people are beginning to venture into tree nursery enterprises, particularly in urban areas (RuttoandOdhiambo, 2017). More than half of the respondents (83.3%) were married. This is supported by Larinde and Santus (2014), who reported 68.4% married nursery entrepreneurs. Also, Shalnim (2009) reported that 90% of the respondents in his study were married. However, Adeduntan (2015) claimed that 59.3% were single, 30.7% were married while 10% were divorced in a similar study carried out in Akure, Nigeria. There was high level of literacy among nursery entrepreneur in the study area as majority had undergone secondary education (32.50%) and tertiary education (24.16%).

Demographic		F	%
Characteristics		г	/0
Gender	Male	78	65
	Female	42	35
Age	< 30 years	19	15.8
	30-39 years	44	36.7
	40-49 years	28	23.3
	50-59 years	19	15.8
	> 60 years	10	8.3
Marital status	Single	15	12.5
	Married	100	83.3
	Others	5	4.2
Educational	No education	16	13.33
Level	Primary school	14	11.67
	Modern	22	18.33
	Secondary school	39	32.50
	NCE/HND/BSC	25	20.83
	MSC/PHD	4	3.33
Years of	1-10 years	80	66.7
Experience	11-20 years	26	21.7
-	21-30 years	10	8.3
	31-40 years	4	3.3
Business	Inheritance	12	10
Involvement	Apprenticeship	52	43.3
	Formal/Professional training	7	5.8
	Personal Interest	49	40.8
Land	By purchase	4	3.33
Acquisition	Inheritance	4	3.33
	Rent/Lease	34	28.33
	Free gift	78	65.00
Source of	Personal savings	120	100
Funds	Help from family and friends	-	-
	Cooperative society	-	-
	Bank loans	-	-

Source: Computed from Field Survey Data, 2017; F = Frequency

These facts indicate that the tree nursery enterprise could be embraced by educated youths that are either unemployed or under-employed in the society. This is in agreement with Larinde and Santus (2014) who had earlier reported that 60.5% had attended secondary school while 36.8% had attended tertiary education. This was further explained to have contributed greatly to the difference in the respondents' ability to manage their enterprise, how they kept their financial record of income and expenditure and how they raise their seedlings. Similarly, Shalnim (2009) reported that 80% of the ornamental plant producers he interviewed had attended tertiary institutions. This high literacy level of the respondents could affect their choice of inputs and also their willingness to adopt improved technologies. Majority of the respondents (66.7%) had 1 - 10 years of experience in the tree nursery enterprise, ascertaining the fact that popularity of the ornamental tree nursery enterprises is a recent development in Lagos State and Nigeria as a whole (Bota, 2008; Asiedu, et al., 2012). Furthermore, 65% of respondents acquired temporary land for their nursery activities as free gift. This is contrary to Shalnim (2009) who reported that 100% of the respondents interviewed acquired their land through annual rent. All of the respondents interviewed in the study area funded their business through their personal savings as little capital was required to start the business.

Identification of Seedlings Raised in the Tree Nurseries Enterprises: The result of this study as revealed in Table 3 showed that forty one (41) different tree species were identified in the nursery enterprises in the study area. The categories of tree species include forest species, ornamental trees, palm species and fruit species. However, it was observed that the nursery entrepreneurs in the study area raise more of ornamental trees and shrubs and varieties of palm species which were in high demand for the purpose of beautification and landscaping of residential and corporate space. While very few of forest tree species and tropical fruits are available in their nurseries. This is partly due to the fact that very little is known of the usefulness of these tree species. Larinde and Santus (2014) reported that the categories of seedlings produced by the nursery operators interviewed include ornamental, horticultural, forestry, medicinal and agricultural seedlings. Muhammed-Lawalet al., (2012) reported that hedges, trees, palms, grasses are the predominant type of floricultural plants produce in the study area. Table 4 showed the frequency of occurrence of individual species. However, the family Palmea was dominant (36.59%) among the species identified.

Costs and Return Analysis of Tree Nursery Enterprise: The total costs incurred during the production process were determined and the results obtained were presented in Table 5.

S/N	Seedlings Categories	Family	Common Name	Scientific Name	Form
1	Forest	Moringaceae	Moringa	Moringaoleifera	Seedlings
2	species	Pinaceae	Pine	Pinuscaribaea	Seedlings
3	-	Verbenaceae	Gmelina	Gmelinaarborea	Seedlings
4		Fabaceae	Flame of the Forest	Delonixregia	Seedlings
5		Meliaceae	Neem	Azardiractaindica	Seedlings
6	Ornamental	Cupressaceae	Thuja	Thujaoccidentalis	Seedlings
7	species	Combretaceae	Umbrella/Step tree	Terminaliarandii	Seedlings
8	•	Moraceae	Green Ficus	Ficusbeaghalensis	Seedlings
9		Moraceae	White Ficus	Ficusbenjamina	Seedlings
10		Annonaceae	Masquerade tree	Polyaithialongifolia	Seedlings
11		Asparagaceae	Cordyline	Cordylineaustralis	Seedlings
12		Asparagaceae	Yucca	Yucca filamentous	Seedlings
13		Araucariacea	Araucaria	Araucaria auricana	Seedlings
14	Palm	Palmea	Oil palm	Elaesisguineensis	Seedlings
15	species	Palmea	Queens palm	Syragrusromanzoffiana	Seedlings
16	1	Palmea	Royal Palm	Roystonearegia	Seedlings
17		Palmea	Cycas palm	Cycas revolute	Seedlings
18		Palmea	Kings palm	Archontophoenixcunningghamiana	Seedlings
19		Palmea	Golden palm	Dypsislutescens	Seedlings
20		Palmea	Fishtail palm	Caryota species	Seedlings
21		Palmea	Foxtail palm	Wodytiabifurcata	Seedlings
22		Palmea	Licuala palm	Licualagrandis	Seedlings
23		Palmea	Areca palm	Areca catechu	Seedlings
24	Palm species	Palmea	Chinesse palm	Livostoniachinensis	Seedlings
25	I	Palmea	Champagne bottle palm	Hyophorbelagenicaulis	Seedlings
26		Palmea	Fan palm	Coccothrinaxspp	Seedlings
27		Palmea	Lady palm	Rhapisexcelsa	Seedlings
28		Streliziaceae	Traveller's	Ravanalamadagascariensis	Seedlings
29	Fruit species	Palmea	Coconut	Cocosnucifera	Seedlings
30	-	Caricaceae	Pawpaw	Carica papaya	Seedlings
31		Anonaceae	Soursop	Annonamuricata	Seedlings
32		Oxalidaceae	Star fruit	Averrhoacarambola	Seedlings
33		Combretaceae	Almond	Terminaliacatappa	Seedlings
34		Anarcardiaceae	Cashew	Anacardiumoccidentale	Seedlings
35		Lauraceae	Avocado pear	Persea Americana	Seedlings
36		Rutaceae	Grape	Citrus paradise	Seedlings
37		Rutaceae	Sweet orange	Citrus sinensis	Seedlings
38		Myrtaceae	English apple	Syzygiumsamarangense	Seedlings
39		Anarcardiaceae	Mango	Mangiferaindica	Seedlings
40		Sapotaceae	African star apple	Chrysophyllum albidium	Seedlings
41		Myrtaceae	Guava	Psidiumguajava	Seedlings

Table 3: Identification of species found in the private nursery in the study area

Source: Computed from Field Survey Data, 2017

The result revealed that the total cost (TC) of production of tree seedlings in the nurseries was ₦255,075.17. The total variable (TVC) cost incurred was №250,382.50 representing 98.16% of the total cost. While the total fixed cost (TFC) incurred was ₦4,692.67 representing 1.84% of the total cost.The result from this study is similar to the findings of Shalnim (2009) who reported total variable cost and total fixed cost amounted to N288, 100 and N28, 204 respectively. Muhammed-Lawalet al., (2012) also reported that the total variable cost (TVC) incurred was №93,291.9 while Tee and Labo (2010) reported that the production cost incurred in private nursery enterprises interviewed in Makurdi metropolis varied from №158,000 to №820,000.Furthermore, a gross margin of ₦1,462,731.39 was revealed from the sales of seedlings within the study period. The result also showed that a nursery entrepreneur could earn average

annual revenue of ₩1712222.22 given mean annual net income of the respondents to be №1,458,038.72. The profit margin percent of 55.8% was obtained while the return on naira invested was ₩5.71. This is an indication that for every naira invested in tree seedlings production \$5.71 will be obtained in return. Olaleyeet. al., (2015) reported in a similar study in Lagos that the net annual income was N44,335,000.00 and N27,865,000.00 in the year 2008 and 2013 respectively with the ROI in 2018 and 2013 as 96.87% and 95.34%. Shalnim (2009) recorded in a similar study in Jos metropolis that the total cost of producing the plants was N316, 304. The net farm income was found to be ₩351, 196 and return per naira invested N1.10. Tee and Labo (2010) also reported that the rate of return on nursery enterprises in Makurdi metropolis varied from 16.9 % to 76.9%, while, net income (NI) varied from ₩36 250 to ₩900 000. This is because

seedlings in some nursery units were usually sold at relatively lower unit prices than in the other nursery units.However, the variation in the estimate may be due to the fact that the unit prices of seedlings are relatively higher in Lagos metropolis. Thus, it could be concluded that tree seedlings production in the study area was economically viable as the benefit-cost ratio obtained was 6.71. This result is similar with (LarindeandSantus, 2014; Tee &Labo, 2010) reported that, small-scale plant nursery enterprise is profitable

S/N	Family Name	Frequency	(%)
1	Anarcardiaceae	2	4.88
2	Annonaceae	2	4.88
3	Araucariacea	1	2.44
4	Asparagaceae	2	4.88
5	Caricaceae	1	2.44
6	Combretaceae	2	4.88
7	Cupressaceae	1	2.44
8	Fabaceae	1	2.44
9	Lauraceae	1	2.44
10	Meliaceae	1	2.44
11	Moraceae	2	4.88
12	Moringaceae	1	2.44
13	Myrtaceae	2	4.88
14	Oxalidaceae	1	2.44
15	Palmea	15	36.59
16	Pinaceae	1	2.44
17	Rutaceae	2	4.88
18	Sapotaceae	1	2.44
19	Streliziaceae	1	2.44
20	Verbenaceae	1	2.44
	Total	41	100.00

Source: Computed from Field Survey Data, 2017.

Table 5: Summary	y of Cost and Return analysi	s
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S/N	Variable	Total Amount
1	Total Revenue	1712222.22
2	Total Variable Cost	250382.5
3	Total Fixed Cost	4692.67
4	Total Cost= (TFC+TVC)	255075.17
5	Gross Margin (R+TVC)	1462731.39
6	Net Income= (GM-TFC)	1458038.72
7	RORI = (R-TVC)/TVC	5.71
8	RORI (%)	571.26
9	BCR	6.71

Source: Computed from Field Survey Data, 2017.

Socioeconomic Factors Affecting Profitability of Tree Seedlings Production:Logit regression estimate was carried out to determine the socio-economic factors influencing revenue generation in nursery enterprises in the study area and the result are presented in Table 6. These factors include: Age (W1), Years of formal education (W2), Land acquisition (W3), Household size (W4), Years of experience (W5), Marital status (W6) and Gender (W7). The result showed the coefficient of age to be negative (-0.174381) and significant at 5%. This means that an increase in age by one year will decrease the total revenue by 0.17. This is because the ability of nursery entrepreneurs to do tedious work diminishes as they lose their youthfulness. This is in line with the findings of Muhammed-Lawalet al. (2012).

More so, the coefficient of land acquisition was found to be negative (-0.6899949) and significant at 5%. This indicates that increase in cost of land acquisition process will reduce the total revenue by 0.70. The coefficient of years of formal education is also negative (-0.19716) and not significant. This indicates that increase in level of education has negative influence on nursery productivity and thus insignificant. This could be as a result of the fact that operating a nursery enterprise is open to everyone regardless of their area of specialization in school and their level of education.

However, this is contrary to *a priori* expectation, as years of formal education is expected to have a positive influence on the productivity of the entrepreneurs. Furthermore, the coefficient of experience in nursery enterprise was positive (0.0978015) and significant. Increase in experience in nursery enterprise by one year will result in increased productivity by 0.1%.

This indicates that individuals who have mastered the business by virtue of the length of their years of experience tend to increase in productivity because they are conversant with certain trade secrets which new entrant into business may not be aware of. Gender is statistically insignificant this is because both male and female nursery entrepreneurs require the use of hired labour in order to enhance productivity.

Table 6: Summary of	Logit Regression of Socio-Economic Factor	ors Affecting Tree Seedlings Production
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, e	0				
Variables	Parameters	Coefficients	Standard Error	T-Value	R2
Constant	W0	7.845821	2.605557	3.01**	
Age	W1	-0.174381	0.0485828	-3.59**	
Years of Formal Education	W2	-0.019716	0.0526575	-0.37 ns	0.1536
Land Acquisition	W3	-0.6899949	0.3366681	-2.05**	
Household size	W4	0.2248239	0.2097861	1.07 ns	
Years of experience	W5	0.0978015	0.0408834	2.39**	
Marital Status	W6	-0.4454284	0.7033723	-0.63 ns	
Gender	W7	0.3412225	0.4724486	0.72 ns	
a a	1.0		2017 *** 00	. 50/	

Source: Computed from field survey data, 2017.**Significant at 5%

Conclusion: The result of this study showed that tree nursery enterprises are of great value to the economy of the Lagos metropolis, thus, needs to be encouraged and promoted as a means of livelihood among the people. However, most entrepreneurs were faced with shortage of land for establishments of tree nursery in the study area. Therefore appropriate actions in reducing cost of land lease/purchase are recommended to encourage new entrepreneurs and strengthen the sector's development.

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