

# An Assessment of Ornamental Nursery Operation in Akwa Ibom State, Nigeria

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## Abstract:

This study assesses ornamental nursery operation and factors that influence gender composition variation among the operators in Akwa Ibom State, Nigeria. Data was collected using a structured administered to all the nursery operators in the study area being 42 operators. Descriptive statistics and ordinary least square regression were employed in analyzing the data collected. The findings revealed that majority of the respondents were male (66.67%), married (71.43%), literate (95.24%), between the age class of 25-54 years (85.77%), had been in operation for >6years (71.43%), acquired training in the operation (66.20%) and earned an annual income of ₦301,000-₦400,000 (47.62%). Also, majority of them obtain the seeds/cutting from mother trees (41.18%), preserved their seeds by drying (48.84%), used paid labor (68.89%), operated ornamental nursery size of <0.05ha (88.10) and operated all year round (100%). The result of regression analysis showed that the factors accounted for 67.9% of the variation in gender composition in nursery operation and was significant at  $p < 0.001$ . Age (-0.403,  $p < 0.001$ ), years in business (-0.209,  $p < 0.05$ ), income (2.751,  $p < 0.05$ ) and training in business (0.541,  $p < 0.001$ ) were the major determinants of gender variation. It is recommended that considering the annual income of the ornamental nursery operators, more people should be encouraged to venture into the business in order to expand the ornamental nursery sector in the state.

## Keywords:

Ornamental Nursery, Gender, Silviculture

## 1. Introduction

Production of ornamental plants became commercially important in the beginning of the 20th century [1,2]. Today, in many countries, production of ornamental plants has become an effective commercial sector contributing to the economy. In Nigeria, the concept of raising ornamental plant seedlings for environmental modernization and urban development is relatively a new concept as compared to other developed and developing countries. However, its spread in the country and cities, in particular, has been remarkable because of its aesthetic value and economic potentials [3].

Awareness on the importance of having plants both inside and outside residential areas is therefore on the increase [4]. Ornamental plants provide various benefits to

the environment, including protection of soil and buildings and may be used as hedge which screen or provide privacy, provide edible fruits, and above all, beautify the environment [5,6,7]. Consequently, there is an increase in the number of the ornamental nursery operator and these nurseries have been receiving increasing attention and patronage as more people plant trees, shrubs and grasses around their buildings.

However, while vegetables and fruit trees attract greater appreciation and attention from investors, industries, restaurants and food organizations with appreciable impact on the national economy, landscape and ornamental horticulture in Nigeria appear to be isolated and relegated to the background in terms of production and marketing of ornamental plants as compared to other countries [8].

A couple of studies conducted on the operation of ornamental nurseries in the country indicates that majority of the operators are male, hence this study apart from assessing the operation of the nursery in the study area also considered what are could be the major determinant for more male operators in the ornamental nursery business than the female operators.

## 2. Materials and Methods

### 2.1. StudyArea

The study was conducted in Akwa Ibom State, located on the south-south geo-political zone of Nigeria. The State lies between latitudes 4°33' and 5°35' N and longitudes 7°35' and 8°25' E and is within the tropical rainforest zone [9]. It 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 [10]. The climate of the state is characterized by two seasons (rainy or wet season and the dry season). The total annual average rainfall is about 2500mm [11]. Temperatures are uniformly high throughout the year with slight variation between 26°C and 28°C. The soil types found in Akwa Ibom State are associated with one another in an intricate manner, but are very similar [12].

### 2.2. SamplingandDataCollection

The target population for the study was the ornamental plant nursery operators in Akwa Ibom State. Specifically, six local government areas namely; Eket, Oron, Ikot Ekpene, Abak, Uyo and Etinan were selected after a reconnaissance survey was undertaken to identify sites of existing ornamental nurseries within the study areas. Total sampling was carried out as the overall population in the entire six locations was forty-two (42) nursery operators. This formed the sample size of the study. Structure questionnaire were used to obtain information on the production of ornamental plant nursery in the study area.

Descriptive tools such as tables, frequency tables, percentage and bar chart were used to examine the socio-economic characteristics of ornamental plant nursery producers.

Least square regression analysis was used in computing the determinants of rural household poverty incidence for the study area. The formula is indicated in equation 3 as specified by [13,14,15]:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \dots + b_7X_7 + \mu$$

Where

Y	=	Gender of operator (Male=1 and Female=0)
a	=	Constant
bi	=	Parameters estimates to be computed and i = 1,2...7, which are the regression co-efficient of X <sub>i</sub> variable.
X <sub>1</sub> (Age)	=	Age of nursery operator (years)
X <sub>2</sub> (Maritalsta)	=	Marital status of nursery operator (Married=1, Notmarried=0)
X <sub>3</sub> (YrsofBusi)	=	Years in Business (Years)
X <sub>4</sub> (TrainBus)	=	Years of residence (1= born in the community and 0 = otherwise (migrated)
X <sub>5</sub> (Edu)	=	Educational status of nursery operator (years)
X <sub>6</sub> (Income)	=	Annual income of nursery operator (₦)
X <sub>7</sub> (Labour)	=	Labor source of nursery operator (Paid labor = 1, Not paid labor = 0)
μ	=	Factors that may not be adequately accounted for but contribute to total income

**Table 1.** Definition of dependent and independent variables included in the econometric model and expected signs (aprioriStatement).

Variables	Typeofvariable	Expectedsigns	
Age	Continuous	+	-
Maritalstatus	Binary/dummy	+	-
YearsinBusiness	Continuous	+	-
TraininginBusiness	Binary/dummy	+	-
Educationalstatus	Continuous	+	-
Income	Continuous	+	+
Labour	Binary/dummy	+	+

### 3. Results and Discussion

#### 3.1. Demographic Characteristics of Respondents

The demographic characteristics of ornamental plant producers in the study area revealed that majority (66.67%) of the ornamental plant nursery operators were male (Figure 1), implying more male operators than their female counterpart in the ornamental plant nurseries. This dominance has been attributed to the arduous nature of ornamental plant nursery business [16,17,18].

The majority (85.71%) of the nursery operators' age ranged between 25 and 54 years old, while the least (4.76%) were those whose age were below 24 years old (Figure 1). Those in the dominant age range were composed of youths and this predominance could be attributed to them being young, agile and energetic people capable of making good production decisions and having the potential for high productivity. This finding corroborated that of [19] which reported a dominant age range of 26-60 years in a similar study in Kwara State, Nigeria in addition to the finding of [20] and [21] that defined economically productive age in a population to be 19 - 49 years.

Figure 1 also shows that majority (71.43%) of the respondents were married, while 23.81% were single and 4.76% widowed. This was an indication that majority of the respondents had families and a burden to cater for them, thus placing a huge demand

on them to produce more ornamental plant for marketing to generate income for the upkeep of the families.

According to [22], [23] and [24], education enhances a person acquisition and utilization of information on improved technology as well as his/her innovativeness. Therefore, considering that majority (95.24%) of the respondents had formal education to make them literate (Figure 1), they found it easy to understand and adopt new technological innovations and methods of production that made them more efficient in their production. On the other hand, many of those that had no formal and primary education were used to a particular method of raising their plants (*i.e.* through seeds and cuttings) except for those who had been in the enterprise for a long time. Thus, higher level of education may lead to better management of farming activities because educated ornamental operators were more likely to access information easily and use it to make well informed decisions [23].

The income level of the respondents (Figure 1) indicates that majority (47.62%) of them earned between ₦301,000- ₦400,000 revenue annually while those in the least income level (2.38%) earned ₦501,000 and above per annum. This implies that the business is profitable and a reliable means of livelihood for the nursery operators, hence then high rate of those who have been in the business for a long time.

Continuous practice in an enterprise over a long period presumably makes one more experienced and productive in a venture [16,18]. Considering that majority (71.43%) of the respondents had been in the nursery operation for not less 6 and more than 15 years (Figure 1), they possess the experience and are more productive to continue in the business irrespective of the economic situation than new comers into the nursery operation business.

Majority (66.2%) of the respondents had training for the ornamental nursery operation. The training acquired by majority (71.42%) of them was through apprenticeship and experience from their former work places. However, 23.80% of the respondents had training through workshops/seminars and secular academic training (Figure 2). Nursery crop production requires highly technical and specialized production skills, particularly in propagation, the plants growing conditions, insects, and diseases to achieve efficient production [22].

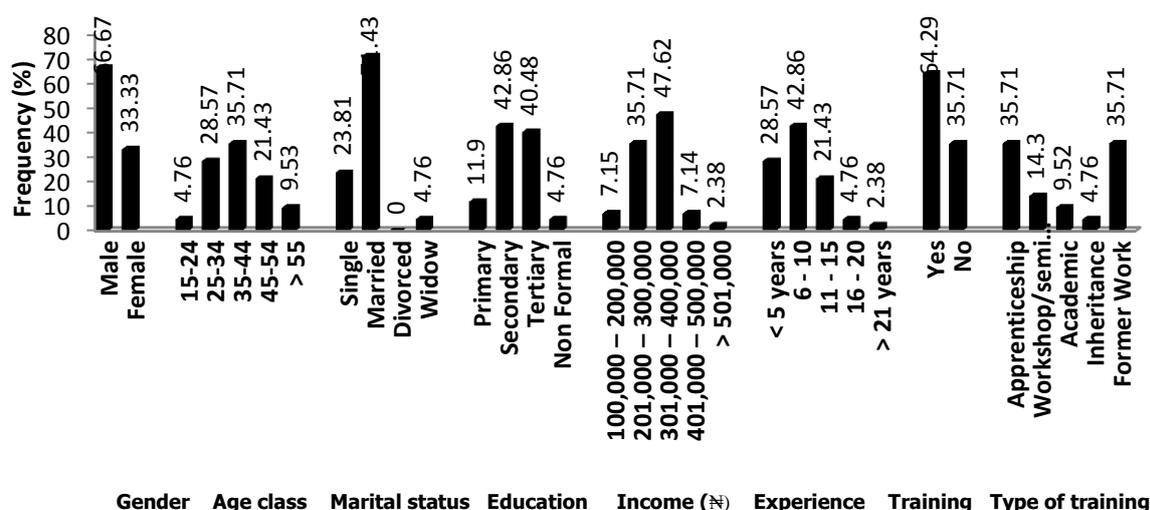


Figure 1. Demographic characteristics of ornamental plant nursery operators.

### 3.2. Ornamental Nursery Establishment

The quality of a seedling is determined by the genotype of the seed from which it originates [25]. About 41.18% and 33.33% of the respondent respectively obtained their seeds/planting stock mostly from the mother plants and markets, while Research institutes was the least (2.94%) sort area (Figure 2). This agrees with the observation of [26] that nursery operators obtained their seeds/cuttings mostly from sources they are sure and knowledgeable that they would produce the desired trait in their stocks. Furthermore, the acquisition of seeds/cuttings from the mother plants reduces the cost of seeds/cuttings procurement/production, thereby increasing the profit return.

Majority (48.84%) of the respondent preserved their seeds mainly by drying while stems/cuttings were preserved by raising the cuttings/stems for the next planting season (Figure 2). Only 2.32% of the respondents used cold storage method for seed preservation. The widely used drying method is attributed to it being at no costs to the farmer, but increases profit margin [27]. Also, the low patronage/usage of cold storage is attributed to the lack of reliable electricity supply and the provision of a cold store rooms for cooling of produce is almost impossible considering the huge financial implication of running them.

Nursery output mainly depended on nursery size. A number of studies indicated that the size of farm affected the efficient utilization of resources [28,29,30,31]. The result in Figure 2 indicates that majority (88.10%) of the respondents operated on a nursery size that were generally less than 500m<sup>2</sup> (0.05ha). This finding agreed with that of [32] that about ninety percent of ornamental plants production in Nigeria was operated on small land sizes.

Majority (68.89%) of the respondent employed paid labour in nursery operations, while only 31.11% of the respondents employed family labour for the operations (Figure 2). The hired labour varied from daily paid labour to monthly paid staff. However, the rate of family labour varied with the observation of [33], who recorded that 86.6% of poultry owners in Imo state, Nigeria used family labour only. This was attributed to poultry requiring sensitivity and prompt execution of basic operations such as feeding, sanitization, vaccination, etc, which could conveniently be provided by the family.

The main source of land for majority (90.48%) of the ornamental plants nursery operators were lease/rented lands (Figure 2). This is attributed to the location of the nurseries. These sites are owned statutorily by the government. The sites are located along major roads which are good for ornamental plant nursery establishment as they are easily accessed by consumers within the city metropolis.

All business ventures including the nursery business require large capital investments to cover the cost of land, equipment, buildings, supplies, labour, and stock [22]. As indicated in Figure 2, majority (85.71%) of the respondents used personal fund in the establishment of the ornamental plant nursery as a result of their inability to acquire credit facilities from the bank. This observation agrees with [34], [35] and [36] who attributed the decline in the contribution of agriculture (floriculture inclusive) to the nations' economy to the lack of a formal national credit policy and paucity of credit institutions that could assist farmers in the provision of inputs that would improve their economic condition to be self-sufficient and reliant in food production.

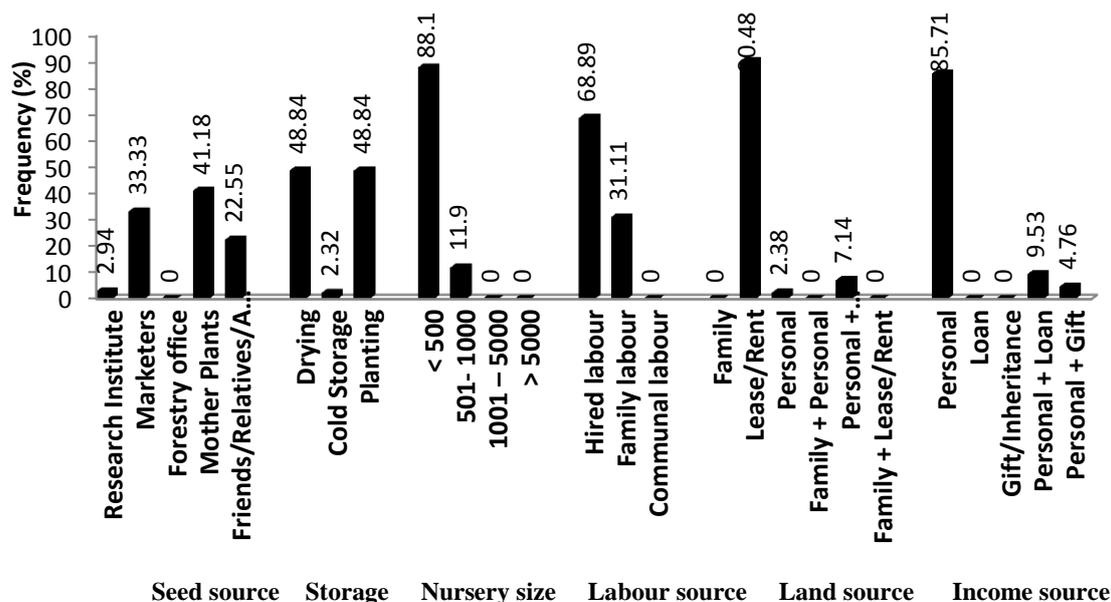


Figure 2. Input sources for ornamental nursery establishment in Akwa Ibom State.

### 3.3. Ornamental Nursery Production

The containers used in ornamental nursery production are presented in Figure 3. About 36.84% and 35.96% of the respondents respectively used old cement bags and polypots in raising their stock, while only 6.14% used germination beds for producing their nursery stocks. Polypots were the generally accepted containers for seed germination or transplanting. However, due to the high cost of procuring the polypots, the operators also reverted to the use of ‘pure water’ sachets and old cement bags. The old cement bags were very useful in raising ornamental trees (*Terminalia mantaly*, *Araucaria rivularis*, *Hura crepitans*), palm seedling (*Archontophoenix cunninghamiana*, *Hyophorbe lagenicaulis*) and older plants which could not be transplanted into polypots as they helped the roots to spread without restriction. The non-patronage of the germination beds for seedling production in the study area agreed with the observation of [37], which directs sowing into polypots is suitable for small nursery operators. This method allowed undisturbed seedling growth and thus reduced stress for the seedling that could have been introduced during transplanting [37]. Furthermore, planting in the polypots saved time, labour and money, because the extra step of preparing a seed-bed and transplanting is eliminated. Also, considering the small sizes of the nurseries, the nursery operators were unable to operate germination beds on the same plots where the seedlings were displayed for sale.

Figure 3 also revealed that majority (59.70%) of the respondents operated retail nurseries while 37.31% operated a combination of both retail and wholesale nurseries. Due to the fact that output was dependent on farm size [28,29,30,31], the retail ornamental nursery operators raised mostly plants form that were in high demand. Those who operated a combination of both retail and wholesale nurseries sold their nursery stock to their colleagues, contractors and institutions on request.

All the respondents (100%) in the study area produced their nursery stock all year round (Figure 3). Production of ornamental plants was done in both dry and rainy seasons. This finding agreed with the observation of [38] that nursery stocks could be produce all year round. Also, there was little need to protect the plants from low or high temperatures as majority of the nursery stocks (over 93.86%) were grown in

containers and the nursery sizes were small, so that they were easily managed in all seasons.

The ornamental nursery operators used various types of pre-germination treatments to enhance seed germination (Figure 4). However, cold water soaking (38.18%) was the most used method followed by soaking seeds in chemical (28.19%) and hot water soaking (27.27%). Cold water treatment was the most used method because it was cheaper and easier to apply than all the other methods without fear of damaging the seeds [25].

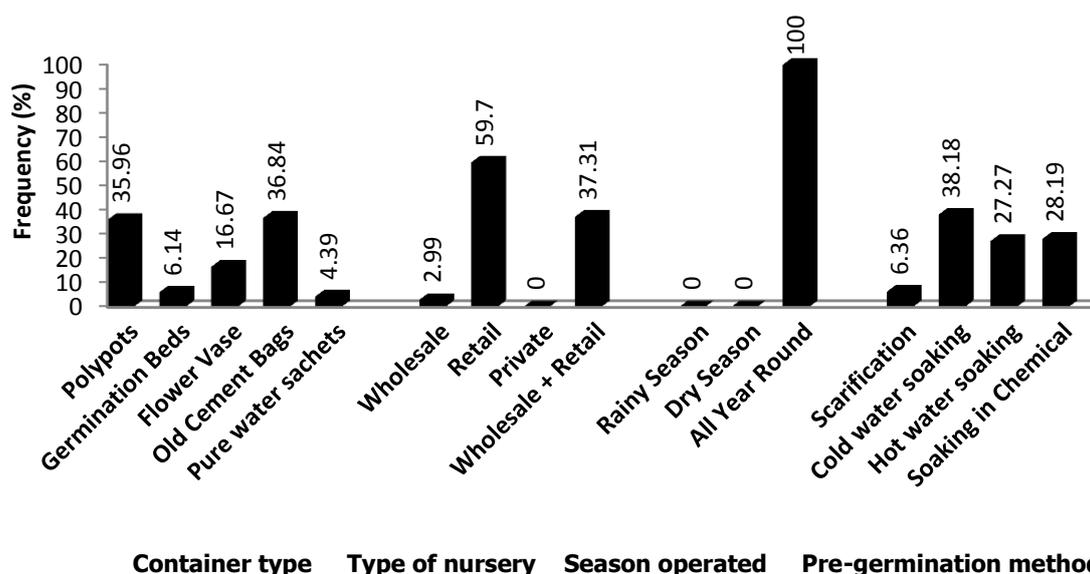


Figure 3. Ornamental nursery operated in the study area.

### 3.4. Determinants of genderoperation of ornamental nursery in Akwa Ibom State, Nigeria

Ordinary Least square (OLS) regression result in Table 2 depicts the factors affecting operation of an ornamental nursery in the study area. Gender of operator varied from one nursery to another and was influenced by factors such as age, education, marital status, income, labour, years in business and training in business. The model indicated that 67.9% of the observed variations in gender of nursery operator were explained by these factors. The regression was significant at ( $p < 0.001$ ) suggesting the model has a strong explanatory power (Table 1). Age (-0.403,  $p < 0.001$ ) and years in business (-0.209,  $p < 0.05$ ) of nursery operator were inversely (negatively) related with variation in gender of operator, thus conforming to the *a priori* statement. The implication of the negative or inverse relationship of age with gender of operator could be attributed to the fact that as operator aged, more experienced is gained and there is increased ability to take risk and diversify livelihood strategy and *vice versa*, thus confirming with findings of [39,40] and [15]. More so, years in business increase the variation in gender composition of ornamental nursery operators. In other words, continuous practice in an enterprise over a long period presumably makes one more experienced and productive in a venture and to continue in the business irrespective of the economic situation [16,18].

Training in business (0.541,  $p < 0.001$ ) was positive and had significant relationship with variation in gender composition of nursery operators. This indicates that an increase in training in the business and income increases the variation in gender

composition of nursery operation. This did not conform to the *a priori* statement. This could be attributed to the type of training needed to be undertaken, duration of training and cost of training. More so, the male gender is more favoured to undertake and longer duration of training irrespective of the cost than their female counterpart. Also, income (2.751,  $p < 0.05$ ) was positive and had significant relationship with variation in gender composition of the nursery operators, thus agreeing with [41] that income influences the selection or choice of work a women undertake. Also, [42] and [43] also provide evidence of more women workers at the lower-earning occupations, including those in the food sector.

On the other hand, marital status (-0.044,  $p < 0.001$ ), and educational status (-0.128,  $p < 0.001$ ) were negative and insignificant with variation in gender composition of the nursery operators (Table 2). The negative implication of these variables implies that their increase will decrease the variation in gender composition, thus conforming to the *a priori* statement. The negative value of marital status shows that marriage reduces the gender variation in composition of the nursery operators because, both couple can be engage in the same business making it a family business which also provides for a source of labour (Figure 3). Also, the negative value of education is in agreement with the observation of [22,23,24] that education enhances a person acquisition and utilization of information on improved technology as well as his/her innovativeness to make well informed decisions which therefore reduces variation in gender composition.

Furthermore, labour (0.008,  $p < 0.05$ ) was positive and although it did not have significant relationship with variation in gender composition of the nursery operators. The positive sign of the labour conform to the *a priori* statement, implying an increase in gender composition variation among the ornamental nursery operators. Figure 4 indicates the nature of the work being arduous and tasking, hence majority of the operators used paid labour to operate their nursery. Also, considering the age class of majority of the nursery operators, most feminine gender would not like to be engaging in difficult job, especially in the urban area, thus contributing to the variation. This agrees with the observation of Nelson (2015).

**Table 2.** Determinants of gender operation of ornamental nursery in Akwa Ibom State, Nigeria.

Explanatory Variables	Coefficients	Standard Error	t-value	Significant Level
Constant	1.145	0.207	5.545	***
Age	-0.403	0.097	-4.159	***
Marital Status	-0.044	0.141	-0.310	ns
Years in Business	-0.209	0.092	-2.263	**
Training in Business	0.541	0.170	3.185	***
Educational Status	-0.128	0.126	-1.012	ns
Income	2.751E-6	0.000	2.129	**
Labour	0.008	0.157	0.049	ns

\*\*\* =  $p < 0.001$ , \*\* =  $p < 0.05$ , \* =  $p < 0.10$ , ns = Not significant,  $R^2 = 67.9\%$ ;  
 Dependent variable = Diversity of total income

#### 4. Conclusions

There are very few people in the study area operating ornamental nursery business, hence there exist opportunities for the expansion of the business considering its

contribution in livelihood of the people and the growing market of ornamental plants in the country. Efforts by relevant authorities and agencies must be intensities to enlighten the public on the social and economic benefits to be accrued form the business.

## Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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