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EFFECT OF FOUNDATION SEEDS ON THE OUTPUT OF YOUTH VEGETABLE FARMERS IN FCT, NIGERIA.

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Abstract
Effect of foundation vegetable seeds on the output of youth farmers were investigated in Federal Capital Territory, Nigeria. The multistage sampling techniques was employed to collect data from 160 vegetable farmers using a well-structured questionnaire. The data collected were estimated using descriptive statistics as well as Stochastic Frontier Production Function Approach. Results from the descriptive analysis revealed that majority (87.5%) of the vegetable farmers were unmarried, (63.75%) were males, (85.63%) were between 21 and 40 years old, (61.88%) had tertiary education. The mean age, household size, farm size and farming experience were 25 years, 5people, 4 hectares and 6 years respectively. The results from the Stochastic Frontier Production Function for MLE and OLS revealed that factors such as: farm size, fertilizer and seeds improved vegetable output for foundation vegetable seed users while factors such as : farm size, labor and fertilizer impact vegetable output for non-vegetable seed users. The foundation vegetable seed users increased the output of seed users more than the non-users in the study area. The results with respect to farmers production constraints showed that high cost of fertilizer, poor storage facilities, perishability of product, poor credit facilities and poor sales were the major constraints to vegetable farming in the study area. Policy framework to address issues of fragmented farmlands, high input cost and storage facilities were recommended.

Keywords: Foundation seeds, Stochastic Frontier Model, Vegetable Output, MLE, OLS, Youth Farmers, FCT Abuja.

Introduction
Badmus and Yekini (2011) stated that in developing nations Nigeria inclusive, vegetable consumption is often lower than Food and Agricultural Organization's recommendation of 75kg per year (206g per day per capital). Busari *et al*.(2013) reiterated that vegetable Production in Nigeria has been on the increase providing food, income and occupation

for the rising population. Vegetable Production in Nigeria ranges from household backyard garden and fragmented farm holdings for family consumption, to large scale commercial production for domestic markets and export. Vegetable crops such as tomatoes, okra, pepper, cabbage, onions, pumpkin, lettuce, spinach are commonly grown in FCT by smallholder farmers as foods and source of livelihood (Giroh *et al*.,2010). Most vegetables are rich in vitamins, iron, minerals, medicine and largely consumed by the larger population. Despite the high rate of intake of vegetables in Nigeria's traditional foods, there exist a shortfall in the output of vegetable foods across the savannah ecological zones creating a gap between supply and demand for vegetable products (Ayoola, 2014). Vegetable production in Nigeria are constrained by high level of risk and uncertainties. This may be attributed to factors such as: climatic problems (drought, flood, frost), poor harvest, pest and diseases, unstable markets, inadequate production inputs and poor capital.

Material and Methods

The study was conducted in the Federal Capital Territory, Abuja created on 3rdFebruary, 1976 from parts of Kwara, Niger and Plateau states and declared capital of Nigeria on 12th December, 1991.FCT is located in the savannah ecological zones of Nigeria lying between latitude 8.25 and 9.20 North of the equator and longitude 6.45 and 7.39 East of Greenwich meridian. FCT is located north of the confluence of the Rivers Niger and Benue covering a total land area of 7,315km ^{2}(2,824 square miles). The FCT has a population of 1,406,239 (NPC,2006) and 2,238,800 people by 2011 estimate with population density of 190 persons per kilometre square. The FCT mineral resources includes marble, tin, clay, mica and tantalite. FCT is made up of 6 Local Government Areas namely: Abaji, Abuja, Bwari, Gwagwalada, Kuje and Kwali. The language spoken includes Nupe, Hausa, Gade, Egibra, Ashe, Gbagyi, Dibo, Ebira, Gupa-Abawa, Gwandara, Kami and Ganagana.

A multistage sampling technique was used to select the study sample. Stage one involves the selection of the 6 LGA's of FCT. Stage two involves the selection of 5 communities from each LGA to make a total of 30 communities. Stage three involves selection of 5 farmers from each community making a total of 150 farmers. Data for the study were analysed using descriptive statistics (mean, minimum, maximum, percentages, frequencies and standard deviation) and Stochastic Frontier Production Function.

Model Specification

This study used the Stochastic Frontier Analysis (SFA) model to determine the output and technical efficiency of the youth farmers. This model was formulated by Aigner *et al* (1977) and Meriden and Van Den Brick (1977). The model is expressed below:-

$TEi = Yi/Yi^* = Exp(-u_i)$ ……..1

$= f(xi ; B)exp(vi - ui)/f(xi ; B)exp\ vi$ ……..2

Technical inefficiency = 1 – TE……..3

Where : Yi = actual vegetable output (observed production output for the ith farm) in kg/ha

Yi* = frontier vegetable output (highest predicted output for the ith farm) in kg/ ha.
The model can be log linearized to be
lnYi = Bo + € [8]BilnXi+ Vi –Ui……4
ln = natural logarithm
Xi = foundation seeds production inputs
Bi = unknown production function parameters
Bo = intercept
Explicitly, the model is as below
lnYi = βo + β1lnX1 + β2lnX2 + β3lnX3 + β4lnX4 + β5lnX5 + β6lnX6 + Vi –Ui……5
Ei= Vi-Ui
Vi = random error with zero mean and variance N(0, ∂^2)
Ui = truncated random non-negative component of Ei, hinders farm from maximizing output because it is associated with farm factors, TE and ranges between 0 and 1.
X_1 = farm size (ha)
X_2= labor (man-days)
X_3 = Fertilizer (kg/ha)
X_4 = seed (kg/ha)
X_5 = capital (Naira)
X_6 = Agro-chemicals (Litres/ha)
From equation 5 above, which was estimated using the maximum likelihood method to give estimates of Beta, Sigma and Gamma.
Gamma(γ) = variance ratio = $\partial_{U1} / \partial_{U1} + \partial_{U2}$.
Lambda (λ) = ∂u/∂v was determined to evaluate the correctness of the specified normal/ half-normal assumption and the goodness of fit.

Results and Discussion

Table 1: Showing Socio-Economic Characteristics of Youth Vegetable Farmers

Categories	No of Respondents	Percentage	Min	Max	Mean	Stddev
Marital Status						
Married	20	12.5				
Unmarried	140	87.5				
Total	**160**	**100**				
Gender						
Male	102	63.75				
Female	58	36.25				
Total	**160**	**100**				
Age (years)						
<20	20	12.5				
21-40	137	85.625				

41-60	3	1.875				
>60	-	-				
Total	**160**	**100**	**18**	**41**	**25**	**1.670**
Educational Level						
Primary education	21	13.125				
Secondary	40	25.00				
education	99	61.875				
Tertiary education	**160**	**100**				
Total						
Household Size **(**Number**)**						
<4	115	71.875				
5-8	40	25.000				
9-12	5	4.125				
>12	-	-				
Total	**160**	**100**	**2**	**11**	**5**	**2.113**
Farm Size						
1 – 2	85	53.125				
3 – 4	55	34.375				
5 – 6	21	13.125				
>6	-	-				
Total	**160**	**100**	**3**	**6**	**4**	**3.642**
Farming Experience						
1-4	124	77.50				
5-8	22	13.75				
9-12	14	8.75				
>12	-	-				
Total	**160**	**100**	**1**	**10**	**6**	**4.567**

Source: Field Survey, 2022

Table 2 Showing Estimation of Stochastic Frontier Production Function for Foundation Vegetable Seed Using and Non-Seed Using Youth Farmers in the Study Area.

Variables	Foundation vegetable seeds users		Non-Foundation Vegetable seeds users	
	MLE	OLS	MLE	OLS
Constant (X_0)	3.241 (3.221)***	2.217(2.168)***	-2.400(-3.423)	-1.409 (-0.834)*
Farm size (X_1)	0.523 (2.183)**	0.419(2.005)	0.467 (4.966)*	-0.752 (-0.247)*
Labor (X_2)	0.723 (0.892)	0.427 (1.689)**	1.367 (0.423)**	2.178 (0.568)
Fertilizer (X_3)	0.425 (4.665)**	+0.045 (1.678)*	0.050 (1.468)*	0.1423 (0.233)*

Agro-Agro-chemicals (X_4)	1.238 (-1.725)	-0.001(-0.567)	5.218 (0.426)	2.187 (0.968)
Seeds (X_5)	0.235 (0.523)*	0.538 (0.0417)*	7.468 (0.571)	5.777 (0.344)**
Capital (X_6)	1.823 (0.472)	1.592 (0.725)	1.489 (2.198)	1.723 (0.589)
Sigma Square	1.046 (2.347)***		1.0588 (3.587)**	
Gamma	0.000 (4.235667.3)**		2.000 (5.24689.4)*	
Log likelihood Value	- 7.0363***		18.678***	

Source: Field Survey, 2022

*****, **,and *, are statistical significance at 1%, 5% and 10% levels**

Table 3: Showing Constraints Faced by Youths Vegetable Farmers in the Study Area.

Constraints	Frequency	Percentage
High cost of Seeds	10	6.25
High Cost of fertilizer	13	8.13
Poor storage facility	19	11.88
Perish ability of product	15	9.38
Inadequate labor	11	6.88
Bureaucratic factor	9	5.63
Poor credit facility	12	7.50
Marketing Problems	8	5.00
Transport problems	10	6.25
Poor sales	12	7.50
Technical know-how	6	3.75
Low out put	10	6.25
Poor road network	7	4.38
Land ownership problem	6	3.75
Inadequate fertilizer	5	3.125
Inadequate Agro-Chemicals	7	4.38
High production cost	6	3.75
TOTAL	**160**	**100.00**

Source Field Survey, 2022

Table 2 gives a summary of the estimated Stochastic Frontier Production Function by the Maximum Likelihood Estimation (MLE) and the related Ordinary Least Square (OLS) for the foundation vegetable seed users and non-users. The results showed that Sigma

squared, Gamma and Log Likelihood for users non-users of foundation vegetable seeds were significant, this confirm the goodness of fit for the model. The Maximum Likelihood Estimates for both vegetable seed users and non-users are better compared to ordinary least square estimates due to more variables which are significant. Comparatively, the constant term for vegetable seed users is positive and statistically significant at 1% while the constant term non-users were negative and statistically significant at 10%. For the seed users, the coefficient for the farm size(X1), fertilizer (X3), capital (X6), labor (X2) and seeds (X5) were positive, though capital and labor were insignificant under MLE but labor is significant under OLS at 5%. Variables such as farm size, fertilizer and seeds had positive impact on vegetable output. This implies that 0.425, 0.523 and 0.235 units increase in fertilizer , farm size and seeds input will lead to a unit increase in output of vegetable seeds. Agro-chemicals has a negative relationship with vegetable output and statistically insignificant. for the non-users, the coefficient for farm size (X1), labor (X2), fertilizer (X3) were positive and statistically significant at 10%, 5% and 10% respectively. This showed that 0.467, 1.367 and 0.050 units increase in farm size, labor and fertilizer inputs will bring about a unit increase in vegetable output. Agro-chemicals, seeds and capital variables were insignificant statistically.

Constraints Faced By Vegetable Farmers

Table 3 summarized the constraints faced by vegetable farmers in the study area. The constraints are multi-dimensional. The major constraints are: high cost of fertilizer (8%), perishability of product (9%), poor storage facilities (12%), poor credit facilities (8%), poor sales (8%), making a total of 45% of the vegetable farmers. Other constraints includes: high production cost (3.75%), inadequate fertilizer (3.125%), inadequate agro-chemicals (4.38%), land ownership problem (3.75%), poor road network (4.38%), technical know-how (3.75%), marketing problem (5.00%). The results showed that poor storage facilities, poor access to credit, exorbitant fertilizer prices, poor sales and perishability of vegetable produce due to poor storage facilities were constraining factors to vegetable productivity in the study area.

Socio-economic Characteristics of the Farmers

Table 1 summarized the socio-economic characteristics of the youth vegetable farmers. 87.5% and 63.75% of the youth farmers are males and single. This implies that majority of the foundation vegetable farmers are unmarried youthful males who are still agile within the active labor force. The results also showed that about 86% of the farmers are between 21 and 40 years of age indicating availability of labor force in the study area. Majority of the youthful farmers (61.68%) are tertiary education certificate holders indicating high level of literacy among the vegetable farmers. The farm size, farming experience and age had mean of 4 hectares, 6 years and 25 years and their standard deviation were 3.642, 4.567 and 3.642 respectively. The mean values above indicated

that the vegetable farmers had access to economic size of farmland with reasonable number of years of growing vegetables in their youthful age.

Conclusion and Recommendation

The study estimated the effect of foundation seeds on the output of youth vegetable farmers in FCT, Nigeria. Data were collected using well structured questionnaire. Descriptive statistics and Stochastic Frontier Production Function Model were used to analyze the data . The following are the major findings. About 88% of the youth vegetable farmers are single, 63.75% are males, 85.63% are between 21and 40 years, 61.68% are tertiary education certificate holders. The Stochastic Frontier Production Function Model results showed that there is a remarkable improvement in the output of foundation vegetable seeds users compared to non- users. Farmers production were constrained majorly with poor credit and storage facilities, high input cost and perishability of vegetables. The study recommended subsidies on vegetable farming inputs and providing improved storage facilities.

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