

FACTORS INFLUENCING GINGER PRODUCTIVITY AMONG SMALLHOLDER FARMERS IN ANAMBRA AND ENUGU STATES OF NIGERIA.

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ABSTRACT

Ginger has a significant potential to promote economic growth and reduce poverty. However, Nigeria's output is low. This study evaluated factors influencing productivity among smallholder ginger producers in Enugu and Anambra states. The study specifically; described the socio-economic characteristics of ginger farmers in the study area; assessed the level of production of ginger in the study area; and determined the factors influencing ginger productivity in the study area. Multi stage sampling technique was adopted in selecting 96 ginger farmers from Anambra and Enugu states. A structured questionnaire was used to collect data. Data was analyzed using descriptive statistics such as frequency, percentage, mean and inferential statistics such as ordinary least squares regression. The study found that majority of the ginger farmers were middle aged and have attained some level of education. The farmers were male dominated. Most of the farmers were married, had averagely sized families, lacked much production experience, were small-scale cultivators of ginger on rented land, and had easy access to extension contacts but poor access to credit. The determinants of ginger productivity included level of education, ginger farm size, farm experience, extension contact, access to credit, and mulching. In order to encourage more farmers to plant the crop, the study suggests educating farmers about the advantages of ginger and empowering them by giving them access to training, soft loans and inputs.

Keywords: Ginger, Productivity, Socioeconomic Factors, Production factors, Smallholder farmers, Anambra State, Enugu state.

INTRODUCTION

A member of the Zingiberaceae family, ginger (*Zingiber officinale* Roscoe) is grown commercially for its fragrant rhizomes. It is regarded for its aroma, flavor, and pungency and is one of the oldest and most well-known commercial spices in the world. Spices are highly valuable, export-focused crops that have a significant impact on the agricultural economies of the countries where they are grown. The most significant cash crop among spices is ginger, which boosts the financial standing of many ginger farmers by offering a source of income. The numerous ways in which people use ginger today have led to an increase in demand for the spice everywhere. India (996,041 metric tons), China (552,192 metric tons), Nigeria (375,305 metric tons), Nepal (293,094 metric tons) and Indonesia (228,707 metric tons) are the top five ginger-producing countries according to 2019 figures (FAO, 2019 as cited in Nation Master, 2020).

Although Nigeria is Africa's largest producer of ginger (FAO, 2019 as cited in Nation Master, 2020), her production is frequently lower than for other exportable goods. Though the output is little, the quality of the product, which is highly sought for on the global market, is excellent. Over 734,000 metric tons of ginger was produced in Nigeria in 2020,

compared to 647,000 metric tons in 2021 (Statista, 2022).

Ginger is grown throughout Nigeria, notably in southern region of Kaduna State and, to a lesser extent, in Keffi and Akwanga Local Government Areas of Nasarawa State (Bokulo, Attahiru and Mohammed, 2015). Recently, ginger cultivation was introduced to southeast Nigeria. Today, the states of Abia, Anambra, Cross River, Ebonyi, Enugu, and Imo grow ginger.

Ginger in the spice sub-sector has a significant potential to promote economic growth and reduce poverty through the creation and expansion of employment opportunities, as well as through the distribution of income and foreign exchange revenues (Sodangi, 2020). However, ginger sector in Nigeria is unorganized, inefficient with low productivity. This is attributed to factors such as poor soil fertility, shortage of improved cultivars, poor agronomic practices and effects of pests and diseases (Amadi *et al.*, 2010).

This study thus, evaluated factors influencing production among smallholder ginger producers in Enugu and Anambra states. The specific objectives of the study were; to describe the socio-economic characteristics of ginger farmers in the study area; to assess the level of production of ginger in the study

area; and to determine the factors influencing ginger production in the study area.

METHODOLOGY

This study was conducted in Anambra and Enugu states. Multi stage sampling technique was used for the study. In the first stage, two local government areas from Anambra and Enugu states were purposively chosen, namely Ogbaru and Anambra East LGAs from Anambra and Ezeagu and Aninri LGAs from Enugu, due to the presence of more ginger farmers in the areas. In the second stage, one community was purposively chosen from each of these LGAs. They are Osamala from Ogbaru LGA and Aguleri otu from Anambra East LGA. In the same vein, Aguobuwa and Nenwe were purposively chosen from Ezeagu and Aninri LGAs, respectively. In the third stage, 12 ginger farmers were chosen at random from the four communities of the two states, for a total of 96 ginger farmers chosen for the study. A structured questionnaire was used to collect data. Data was analyzed using descriptive and inferential statistics.

Descriptive statistics such as frequency, percentage and mean were used to describe the socio-economic

characteristics of the respondents and assess the level of ginger production. Ordinary least squares regression was used to estimate factors influencing ginger production in the study area. The OLS regression equation (1) is given by: $Y = f(X_1, X_2, X_3, X_4, X_5, X_6, \epsilon)$ Where: Y = Quantity of ginger produced per hectare (Kg) and X = Factors: X_1 = Age (years), X_2 = Sex (Male = 1; Female= 2), X_3 = Marital status, X_4 = Educational Level (year). X_5 = Farm Size (hectare). X_6 = Farming Experience (year), X_7 = Income (naira), X_8 = Access to credit (Yes = 1; No= 0), X_9 = Extension contact (Yes = 1; No = 0). X_{10} = Mulching (Yes = 1; No = 0). X_{11} = Fertilizer application (Yes = 1; No = 0), ϵ = error term.

RESULTS AND DISCUSSION

SOCIO ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

Table 1 shows the socioeconomic characteristics of ginger farmers in Anambra and Enugu states. They include educational level, age, sex, marital status, years of experience, household size, membership of cooperative, farm size, extension contact, access to credit and land procurement.

Table 1: Distribution of Ginger Farmers by Socio-Economic Characteristics

Socio-economic Characteristics	Frequency	Percentage
Age		
20 – 29	5	5.20
30 - 39	17	17.71
40 - 49	39	40.63
50 - 59	34	35.42
60 and above	1	1.04
	96	100.00
Sex		
Male	65	67.71
Female	31	32.29
	96	100.00
Marital status		
Single	12	12.50
Married	74	77.08
Divorced	2	2.08
Widow/ Widower	8	8.34
	96	100.00
Level of Education		
No formal Education	7	7.29
Primary Education	8	8.33
Secondary Education	63	65.63
Tertiary Education	18	18.75
	96	100.00
Household size (Persons)		
1-3	17	17.71
4-6	37	38.54
7-9	42	43.75
	96	100.00
Ginger Farming Experience (Years)		
1-5 years	70	72.92
6-10	23	23.96
11-15	3	3.12

	96	100.00
Membership of farmer group or cooperative society		
Yes	38	39.58
No	58	60.42
	96	100.00
Ginger farm size (Ha)		
0.1 – 0.5	82	85.42
0.6 – 1.0	14	14.58
	96	100.00
Mean		0.36
Extension contact		
Yes	55	57.29
No	41	42.71
	96	100.00
Land procurement		
Personal	16	16.67
Lease	14	14.58
Rent	66	68.75
	96	100.00
Access to credit		
Yes	26	27.08
No	70	72.92
	96	100.00

Field survey, 2021

The results of the analysis show that majority (76.05%) of the farmers were between the ages of 40 and 59 years. This implies that the responders were in their mid-life and physically capable of doing the demanding farm labour involved in the cultivation of ginger. This result agrees with earlier studies by Nmadu & Marcus (2012), Ezra *et al.* (2017), Umeh & Ataborh (2007) and Shabu *et al.* (2011).

According to the distribution of farmers by sex, the majority of them (67.71%) were men. This was due to the fact that ginger is a cash crop and favors conventional male tendencies to seek for cash crops over those of women. Men also have greater access than women to productive resources.

The majority (77.08%) of farmers were married, according to the distribution of farmers by marital status. Similarly, the vast majority (92.71%) of farmers have completed various levels of formal education. Education enhances the ability of farmers

to manage an enterprise and contributes to its overall success and efficiency (Amaza, 2000).

The majority of ginger farmers (82.29% and 72.92%) had a household size of 4 to 9 people and 1 to 5 years of ginger farming experience, respectively. Most ginger farmers relied on family members to help out on the farm. The reason for this is that most of the farmers were small-scale farmers who lacked the resources to invest in production mechanization and land expansion. The results support those of Nmadu & Marcus (2012) and Abah *et al.* (2015). The findings also showed that the average size of land under cultivation by ginger producers was 0.36 hectares. The prior claim that the farmers were modest farmers is supported by this.

The majority of farmers (57.29 percent) had contact with extension agents, but only 27.08 percent of them had access to credit. According to the findings, the majority (68.75 percent) of ginger growers cultivate their crop on rented land.

GINGER PRODUCTIVITY IN ANAMBRA AND ENUGU STATES

Quantity harvested per hectare (Kg)	Frequency	Percentage
1,000 – 3,900	79	82.29
4,000 – 6,900	15	15.63
7,000 and above	2	2.08
	96	100.00
Mean		2,693.80

Source: Field survey, 2021

Table 2 shows the quantity of ginger harvested per hectare in Anambra and Enugu states. Results in Table 2 show that most farmers (82%) produced between 1,000 and 3,900 kg of ginger. The average quantity of ginger harvested in the study area was 2,693.80 kg, according to Table 2. According to Statista (February 2022), the quantity of ginger produced in Nigeria in 2020 was over 734,000 metric tons, while output in the study area was about 2.69 metric tons. This indicates that ginger productivity (output per ha) in the study area was low.

DETERMINANTS OF GINGER PRODUCTIVITY

Table 3 shows OLS regression analysis of factors influencing ginger productivity. Exponential form was chosen as the lead equation because it has the highest R^2 value (0.7590) and the highest number of significant variables (R^2 measures the proportion of variation in Y explained by X). This indicates that about 76% of the variation in ginger productivity was explained by variables included in the model. The remaining 24% could be attributed to the variables not included in the regression model.

TABLE 3: REGRESSION MODEL ESTIMATES OF FACTORS INFLUENCING GINGER PRODUCTIVITY IN THE STATES

Explanatory Variables	Linear	Semi-Log	Double-Log	Exponential +
Constant	400.667(1.21)	1073.299 (1.88**)	1.044 (7.10***)	0.418 (14.21***)
Age	69.209 (-1.35)	150.194 (-1.32)	0.146 (-1.49)	0.072 (-1.51)
Gender	94.761 (0.53)	131.934 (0.52)	0.128 (0.94)	0.099 (0.94)
Marital status	71.942 (0.93)	148.709 (1.01)	0.145 (1.24)	0.075 (1.22)
Level of Education	61.365 (-2.83***)	129.789 (-2.22**)	0.126 (-2.87***)	0.064 (-3.41***)
Farm Experience	101.234 (1.60)	151.350 (1.69*)	0.147 (0.71)	0.106 (0.66)
Extension Contact	140.047 (0.56)	131.146 (-0.33)	0.127 (1.09)	0.146 (2.24**)
Access to credit	112.526 (4.60***)	110.713 (4.34***)	0.108 (4.05***)	0.117 (4.34***)
Mulching	134.259 (2.74***)	130.024 (2.84***)	0.127 (2.28**)	0.140 (2.04**)
Fertilizer applicant	116.990 (0.63)	121.905 (0.39)	0.119 (-1.10)	0.122 (-0.80)
Income from ginger	0.001 (-1.01)	90.940 (-0.55)	0.088 (0.07)	7.04e-07 (-0.39)
Ginger farm size	189.662 (5.89***)	78.778 (5.58***)	0.077 (9.13***)	0.198 (8.85***)
R ²	0.6803	0.6972	0.8017	0.7590
R adjusted	0.6395	0.6584	0.7763	0.7281
F- ratio	16.64***	18.00***	31.61***	24.62***

*, **, *** indicates significance at the 10%, 5%, and 1% level, respectively; N = 96

The regression result on Table 3 reveals that five out of the eleven variables considered in explaining ginger productivity were significant. The F-statistic was also highly significant at 1% level of probability indicating goodness of fit. The result revealed that extension contact (5%), access to credit (1%), mulching (5%), farm size (1%) were positively related to ginger productivity while level of education (1%) was negatively related to ginger productivity.

Level of education also indicated a significant negative relationship with ginger productivity. It implies that an increase in an individual's level of education will lead to a decrease in ginger productivity. This does not agree with the a priori expectation of the explanatory variable as stated earlier. The reason for the negative relationship could be due to the fact that the educated ones will prefer to invest their resources in more profitable ventures instead of producing ginger. This is contrary to the findings of Mazzza, Ewuziem and Uwandu (2019). However, a similar result was obtained by Nwaekpe et al, 2021 on utilization of Sweetpotato-based confectioneries among rural households in Abia State, Nigeria

Extension contact indicated a significant and positive relationship with ginger productivity. This implies that extension contacts positively influenced ginger productivity. This implies that those farmers which were visited more by extension officers in ginger farming have a higher possibility of producing more ginger per hectare as compared to farmers with fewer contacts with extension officers. This is because extension education exposes the farmer to improved production techniques which results into the increased farm performance. Similar result was reported by Mmasa & Mhagama (2017) who found a positive relationship between the number of extension visits and ginger productivity among smallholder farmers in Tanzania.

The coefficient for access to credit was positive and highly significant at 1% level of probability. This implies that an increase in access to credit will lead to a corresponding increase in ginger productivity and vice versa. This corroborates the findings of Yusuf (2018). This result suggests that availability of credit is an important factor in accessing inputs for increased productivity. Ekong (2010) asserts that credit is a very strong factor that is needed to acquire or develop any enterprise; its availability could determine the extent of production capacity.

Mulching indicated a significant and positive relationship with ginger productivity. This implies that mulching had a positive effect on ginger productivity. This suggests that mulching ginger leads to an increased yield of ginger per hectare and vice versa.

The coefficient of ginger farm size was positive and highly significant at 1% level of probability. This implies that an increase in ginger farm size will lead to a corresponding increase in ginger productivity. Farmers with more hectares of land under ginger cultivation would produce more ginger leading to higher net returns. This is similar to the findings of Obasi et al., (2013) and Chidiebere-Mark & Ibe (2018) who found that farm size had positive and significant relationships with ginger productivity.

CONCLUSION AND RECOMMENDATIONS

Ginger productivity in the study area was low. Level of education, farm size, extension contact, and access to credit as well as mulching were major determinants of ginger productivity in the study area. The study therefore recommends that: (1) Farmers should be educated on the benefits of ginger in order to attract more farmers to plant it. (2) Ginger farmers should be empowered through provision of trainings and inputs. This will serve as a poverty alleviation outfit. (3) Farmers should be given low-interest loans to help them increase their production.

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