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Appraisal of Participation in Contract Farming among Tomato Farmers in Ankpa Local Government Area of Kogi State, Nigeria

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ABSTRACT

This study appraised the participation of tomato farmers in contract farming in Ankpa L.G.A, Kogi State. Multistage sampling technique was employed for selecting of 120 respondents. Primary data were used for the study. Data were collected using a structured questionnaire. Descriptive statistics and Probit model were used to analyse data collected. The results show that the average age of respondents was 37 years, 85% of the respondents were male, 81.67% were married and 69.17% had secondary education. Average household size was 7 people. Mean farming experience was 15 years. Mean farm size was 3 hectares. Also, 97.50% had no access to extension services, 80.83% did not belong to any co-operative society, while 71.67% had no access to agricultural credit. Sex (0.008) was statistically significant 1%, marital status (0.049), co-operative membership (0.019) and extension services (0.034) were all statistically significant at 5% in determining participation in contract farming. It is recommended that more co-operative societies should be formed in the study area to create awareness on contract farming, thereby making more tomato farmers involved in contract farming.

INTRODUCTION

The transformation of Nigerian agriculture from smallholding to commercial level involves intermediate expansion of agribusiness sector, linking agriculture and the manufacturing sectors (Iro, 2017). It is an agreement between farmers, processing and/or marketing firms to produce and supply specified crop(s) under forward agreements at pre-determined prices (Gondalia *et al*., 2017). Buyers of the specified crop(s) may provide embedded services such as upfront delivery of inputs, pre-financing of input, delivery on credit and other non-financial services such as extension service, provision of training for farmers, transport, and logistics (Will 2013). Food policy makers describe contract farming as a remedy to constraints limiting the productivity and income of small-scale farmers in Nigeria. Such constraints include lack/inadequate credit, limited information about production methods, market risk, price volatility and poor market linkages (Odountan *et al.,* 2020). Several attempts aimed at improving the production of tomatoes have been made, including market reforms which allows for the expansion of contract farming in which agro-enterprises contract farmers prior to planting to supply specific agricultural produce, sometimes providing technical assistance, inputs on credit, and an assured market (Barrette *et al.*, 2012). Tomato farming is profitable to the farmers; improving their living standards, create job opportunities in agriculture and agro-allied sectors thereby boosting the overall economy of Nigeria. Quite a few studies have been conducted on tomato farming; for instance, Ayandiji, Adeniyi, & Omidiji (2011) undertook

research on tomato contract farming in Ogun State, Nigeria. Dolapo *et al.* (2022) investigated the Resource use efficiency and profitability analysis of tomato production in Federal Capital Territory, Nigeria. Gondalia *et al*. (2017) provided empirical evidence on the comparative economics of contract and non-contract farming of potato in Gujarat. Nwigwe *et al.* (2020) examined the Cost and returns analysis for small-scale dry season tomato production in Onitsha Agricultural Zone of Anambra State. Also, Iro (2017) provides empirical evidence on contract farming in Northern Nigeria: case study of production of tomatoes among several other studies. Despite these studies undertaken previously on contract farming, farmers in the rural areas of Nigeria still suffer from marketing risks associated with the sale of their produce, price volatility which sometimes discourage farmers from farming and poor market linkages. These challenges have increased poverty level as well as food insecurity among rural farmers especially in the study area. It is against this backdrop that this study was designed to appraise the participation in contract farming among tomato farmers in Ankpa Local Government Area, Kogi State. The objectives of this study were to: (i) describe the socio-economic characteristics of tomato farmers in the study area and (ii) determine factors influencing participation in tomato contract farming in the study area.

METHODOLOGY

This study was conducted in Ankpa Local Government Area of Kogi State, located on the A233 highway in the Eastern part of Kogi State. It is located between latitude 70 15" North and 70 37" North of the Equator and longitude 70 30" East and 70 and 37" East of the Meridian (NPC, 2006). It shares boundaries with Benue State to the East, Enugu State to the South and Omala Local Government to the North. It has 18 districts and estimated population of three hundred and nine thousand, nine hundred and thirty (309, 930) people and a land mass of two hundred and sixty-two (262) square kilometre (NPC, 2006). Agriculture is the major occupation of the people. Farming is traditionally accomplished using primitive tools such as cutlasses and hoes. About 90% of the working population is engaged in crop production. The soil is fertile and supports a variety of crops like Tomato, Okra, Yam, Maize, Cassava, Cowpea, Citrus, Oil Palm, Mango, and Cashew. Major livestock are goats and poultry which are reared extensively. Multistage sampling technique was used to select the respondents. In the first stage, the three (3) major districts were purposively selected. The second stage involved random selection of two (2) communities from Ankpa district, two (2) communities from Ojoku district and four (4) communities from Enjema district based on the preponderance of tomato farmers in those areas. The third stage involved the use of proportionate sampling technique to select 10% of the respondents from the sampling frame, making one hundred and twenty (120) respondents used for the study. Primary data used for the study were collected using a structured questionnaire.

Descriptive statistics such as frequencies and percentages were used to analyse objective (i) while Probit regression model was used to analyse objective (ii).

Model Specification

Probit Regression Model

Probit Regression Model was adopted for the analysis of factors influencing participation in contract farming because the dependent variable (Participation in contract farming) was a binary variable. This was adopted following Ikenna, Zechariahs and Cynthia (2020), who applied the Probit Regression Model to assess agricultural credit Sources and accessibility in Nigeria.

The Probit model is specified implicitly as:

$$Y=f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}) \quad (1)$$

Where: Y=Participation in contract farming (a binary variable; 1, for participation in contract farming and 0, for non-participation in contract farming)

X_1-X_{11}=Vector of explanatory variables (the predictors)

The explicit form of Probit model is as follows:

$$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6+\beta_7X_7+\beta_8X_8+\beta_9X_9+\beta_{10}X_{10+}\beta_{11}X_{11}+\varepsilon_i \quad (2)$$

Where:

Y=Dependent variable (Participation in contract farming) which is a binary response variable predicted by the model (with responses coded as Yes=1, No=0)

$\beta_{1-}\beta_{11}$ = Coefficients of the explanatory variables
β_0 = Constant
ε_i = Error term
X_1 = Age of farmer (years)
X_2 = Sex of farmer (Male=1, Female=0)
X_3=Marital Status of farmers, (Single=1, Married=2, Divorced=3, Widow=4, Widower=5)
X_4=Educational Level (No formal education=1, primary education=2, secondary education=3 and tertiary education=4)
X_5=Household size (Number of persons)
X_6=Farming experience (Years)
X_7=Co-operative membership (Yes=1, No=0)
X_8=Farm size (hectares)
X_9=Annual income (₦)
X_{10}=Access to agricultural credit (Yes=1, No=0)
X_{11}= Access to extension service (Yes=1, No=0)

RESULTS AND DISCUSSION

Socio-economic Characteristics of Tomato Farmers in Ankpa Local Government Area

The distribution of the respondents based on sex, marital status, educational level, access to extension services and membership of co-operatives was presented in figure 1. It shows that majority (85%) of the farmers in the study area were male. This is consistent with Pelemo *et al*, (2022) who found that majority maize of farmers in Niger State were male. Also, majority (81.67%) of the respondents were married. Most rural farmers marry perhaps to have cheap family labour required for agricultural activities. This agrees with the findings of Akubo *et al*, (2024) who found that majority of Tomato farmers in Ankpa Local Government Area of Kogi State were married. Most (69.17%) of the respondents were secondary school leavers. This is in line with Obafemi et al (2022) who found that most of the sesame farmers in Kogi State had secondary education. Majority (97.50%) of farmers had no access to extension services. This is in tandem with Akubo et al (2024) who found that majority of the poultry farmers in Kogi State had no access to extension services. Also, majority (80.83%) of the respondents did not belong to any farmers, co-operative society in the study area. This contradict the findings of Obafemi et al (2022) who reported that most of the sesame farmers in Kogi State were not members of the farmers' association.

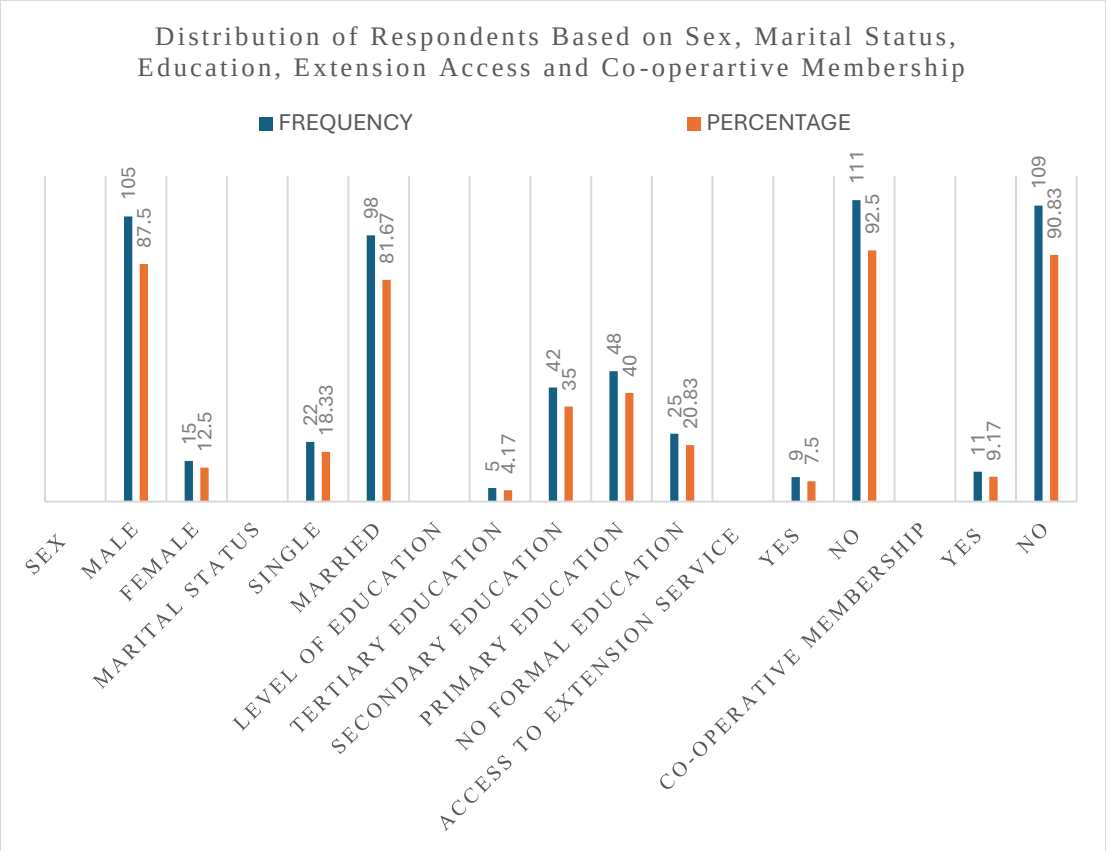


Fig 1: Bar charts showing the Distribution of Sex, Marital status, educational level, Access to Extension Services and Co-operative membership.

The Distribution of the Respondents Based on Age, Household Size, Farming Experience and Farm Size

Table 1 shows the distribution of the respondents based on age, household size, farming experience and farm size. It shows that the mean age of the respondents was 37 years. This implies that farmers were young people who were physically strong to withstand the rigours of manual farming. This result is consistent with Iyaji *et al*, (2022) who found that most of the farmers in Kogi State were in their productive age. Also, the result reveals that the respondents had mean household size of seven (7) people. The household size could serve a source of farm labour. This is in line with the findings of Egwemi et al (2023) who reported that majority of farmers in Kogi State had family size of 6-10 persons. Farmers had mean farming experience of thirteen (13) years. This does not agree with Ikenna et al, (2020), who found that many of the farmers in Nigeria had less than 10 years farming experience. The mean farm size was three (3) hectares, implying farmers had small farm size. This agrees with Obafemi et al (2022) who reported that small scale farmers in Kogi State cultivate about 2.8 hectares of land.

Table 1: Distribution of the Respondents Based on Age, Household size, Farming Experience and Farm size (N=120)

Variables	Frequency	Percentage (%)	Average
Age			
21-30	21	17.50	
31-40	63	52.52	37
41-50	29	24.17	
>50	7	5.83	
Household size			
1-5	19	15.83	
6-10	88	73.33	7
>10	13	10.83	
Farming experience			
1-10	27	22.50	
11-20	41	34.17	15
>20	52	43.33	
Farm size			
2-3	11	9.17	
3-4	34	28.33	3
>4	75	62.50	

Source: Field Survey, 2024.

Determinants of Participation in Contract Farming among Tomato Farmers in Ankpa Local Government Area, Kogi State

The estimate of Probit Regression on factors that influence tomato farmers' participation in contract farming is presented in Table 2. The result shows that Prob > chi^2 (0.0348) was significant at 5% alpha level, implying that the independent variables in the model were jointly statistically significant in determining tomato farmers' participation in contract farming in the study area. The coefficient of marital status was negative and significant at 5% in determining participation in contract farming. This means that a percentage increase in the number of married farmers would lead to 1.039 decreased probability of participating in contract farming. Similarly, an additional wife taken by already married farmers also led to 1.039 decline in the likelihood of involvement in contract farming. It implies that married farmers were less likely to participate in contract farming probably because they could easily breach the agreement due to family responsibilities. This is consistent with the findings of Ahamefule *et al,* (2018) who reported that married small-scale farmers were less likely to be able to repay their loans than single small holder farmers. Membership of co-operative societies was significant at 5% and positively signed. This implies that a unit increase in the number of co-operative societies to which a farmer belongs, would lead to 1.38 increase in the probability of participating in contract farming. This is perhaps because co-operative society is a medium through which contracting individuals/firms negotiate with potential contract farmers. co-operatives could also facilitate timely and effective dissemination of information among members. This is consistent with the findings of Assogba *et al.* (2017), who reported that membership of cooperative associations was found to increase the likelihood of access to formal and semi-formal credit. The coefficient of extension services was positive and significant at 5%. This implies that a percentage increase in the frequency of visits by extension agents to farmers increased the likelihood of participating in contract farming by 1.36. This is in line with the with Ahamefule *et al.* (2018) who reported that the number of supervisory visits was positively related to small holder farmers' ability to repay their loans and that increasing the number of supervisory visits will increases the probability of farmers been able to repay their loans.

Table 2: Probit Estimate on Factors Influencing Participation in Contract Farming (CF)

Participation in CF	Coeff.	Std. error	z	p >(z)
Age	.2960595	.2753922	1.08	0.282
Sex	-1.379698	.5161482	-2.67***	0.008
Marital status	-1.039109	.5268029	-1.97**	0.049
Education	-.0411718	.2517544	-0.16	0.870
Household size	.704186	.4605727	1.53	0.126
Farmin Experience	.2566738	.3377158	0.76	0.447
Co-operatives	1.377048	.5878665	2.34**	0.019
Farm size	-.1172429	.3136182	-0.37	0.709
Extension services	1.356149	.6411742	2.12**	0.034
Annual income	.2222541	.2571965	0.86	0.388
Access to credits	.6223789	.7769785	0.80	0.423
_cons	-3.229346	1.94784	-1.66	0.097
LR $chi^2(9)$	20.87			
Prob > chi^2	0.0348			
Log likelihood	-26.332234			
Pseudo R^2	0.2838			

CONCLUSION AND RECOMMENDATIONS

This study appraised participation in contract farming among tomato farmers in Ankpa Local Government Area, Kogi State. It was found that tomato farmers were mostly male who were young and active. Most of the farmers were secondary school leavers, with average household size of seven (7) persons and average of thirteen years of experience in tomato farming. The average farm size was three (3) hectares. There was inadequate access to extension services, and participation in co-operative activities was very minimal. Farmers also had no access to agricultural credit. Sex, marital status, membership of co-operative society and extension services were the principal factors that determined participation in contract farming among tomato farmers in Ankpa Local Government Area of Kogi State.

Based on the findings of this study, the following policy recommendations were made:

(i) Farmers should come together to form more co-operative societies to create awareness on contract farming, thereby making a greater number of tomato farmers involved in contract farming.
(ii) Provision of micro-credit facility to rural farmers by the government is highly imperative for improving productivity of tomato farmers. Farmers co-operatives could also serve as an informal avenue for micro-credits. This will help to combat food insecurity.
(iii) Government should endeavour to encourage and deploy more agricultural extension agents to the study area, and agricultural extension agents should be keen to their jobs, to keep the farmers abreast of information pertaining to contract farming.

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