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Factors influencing Farmers Participation in Farmers'Field School in Ondo State, Nigeria

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Abstract:
The study examines the effects of Farmers' Field School (FFS) on cocoa productivity inOndoStates, Nigeria. Data were collected by means of well-structured questionnaire from 90 FFS farmers and non-FFS farmers. Data collected were analysed using descriptive statistics and probit regressionmethod. The result shows that in the selection model for Cocoa farmers in Ondo Statethe only significant variable determining FFS participations were age (P<0.001). In addition, only gender is correlatedpositively with the FFS participation probability. It should however be noted that FFS participation probability negatively correlated with extension, education andage.Farmers'field school had significant effects on the productivity of cocoa farming in the study area. The study recommended that government should put more effort on ways to attract and encourage young people who are agile and aggressive in farming business, and that FFS agricultural extension approach should be promoted in the studyarea.

Keywords: *Participation, farmer field school, probit regression and productivity*

1. Introduction

The need to change the extension approaches to participatory extension approaches had raised due to the huge criticism of the previous extension approaches (Ajayi and Okafor, 2006). Many institutions like Farming System Research (FSR), SmallPlot Adoption Technique (SPAT), Farmer Field School (FFS) are practicing this technique. Nigeria had started practicing this from in the Ondo State through the Sustainable Tree Crops Programme from 2003 (Gallagher, 2005; World Cocoa Foundation, 2007; STCP Nigeria, 2007). The main objectives are: Sharpen the ability of the farmers, introduce farmers to new ways of thinking, show farmers the importance of working in groups etc. According to Roling (1995), it boosts the farmers' enthusiasm, self-confidence. But, the effectiveness of this program has not been evaluated, thereby creating a gap that this study filled.We focused on two categories of farmers and they are as follows firstly, farmers that participate in Farmers' Field School (FFS)and those farmers that do not participate in Farmers' Field School.This study intends therefore to examine the factors influencing participation in farmers' field school and the effects on productivity of cocoa in Ondo State, Nigeria

2. Literature Review

2.1. Theoretical Background on Farmers Field School

The FFS approachemphasizes problem solving and discovery based learning. FFS aims to build farmers' capacity to analyze theirproduction systems, identify problems, test possible solutions (FAO, 2003). FFS can also providean opportunity for farmers to practice and test/evaluate sustainableland use technologies. The economics of cocoa production has been examined by Fadipe*et al*. (2012) in Oyo state, Nigeria.Ogunleye and Oladeji (2007)concentrated on factors that influence the choice of market channel. Adedeji*et al*. (2011) examined determinants of production, technical efficiency, and the sources of inefficiency in cocoa production in Oyo State. Earlymodels focusing on transfer of technology using a 'top-down' linear approach (Chambers and Ghildyal, 1984,Birner*et al*., 2006). A sizeable numberof models have been put into practice since the 1970s (Anderson *et al*., 2006), participatory approaches (for example, Hagmann*et al*., 1999), and almost recently farmer field schools (FFSs) (van den Berg andJiggins, 2007). Additionalextension modalities include ICT -based delivery (Birner*et al*., 2006).

Since the beginning of the Farmer Field School (FFS) method in Indonesia, this method of extension has increasingly become extensive (Van den Berg and Jiggins, 2007). Godtland (2004)assessed the impact of a pilot farmer's field-school (FFS) program on farmers' knowledge of integrated pest management (IPM) practices.

3. Research Methodology

The study was conducted in Ondo States of Nigeria. Ondo State is bounded on the East by Edo and Delta States, on the West by Ogun and Osun States, on the North by Ekiti and Kogi States and to the South by the Bight of Benin and the AtlanticOcean.Ondo States lie within the equatorial hot wet climatic belt except for the Northern part of these states wherethe derived savanna climate is experience. A multi-stage sampling procedure was used in selecting the respondents for the study.

- Stage 1: The agricultural zones in Ondo State are Ondo North, Ondo Central and Ondo South respectively were purposively selected based on the information.
- Stage 2: The area of this study was five local government areas.
- Stage 3: The farmers whose names were in the list obtained from STCP and Ministry of Agriculture offices wererandomly selected In all, farmers up to Ninety were selected (45 FFS farmers, and 45 non-FFS farmers from Ondo States) were selected for the study. 45 farmers were selected each from 150 OndoFFS participants constituting 30% of Ondo state FFS participants.

3.1. Analytical Technique

Descriptive statistics such as frequency, percentages, mean and probit regression model were employed in this study

3.2. Probit Regression Model

This is given as

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$$P(Y=1) = F(XB) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{XB} e \frac{-(XB)^2}{2} dx \qquad \text{Equation 2}$$

$$X = \left(1, x_{1i}, x_{2i,\ldots,} x_{ki,}\right)$$

$$\beta' = \beta_o, \beta_{1,\ldots\ldots\ldots\ldots} \beta_k,$$

$$\Pr(\text{FFS } participation\ 1\ and otherwisw\ ) \quad [\gamma_0 + \gamma_1 age + \gamma_2 educationlevel + \gamma_3\ gender + \gamma_4 extensioncontact + v_i$$

4. Results and Discussion

4.1. Socio Economic Characteristic of Respondents

Table 1 shows the socio economics characteristics of respondents in the study area. Age of farmers ranges from 25 – 75years. In the sample no farmer has been found less than 25 years ole, which clearly indicates that youth are not actively engaged. However, the engagement of adults has been praised in the literature also by calling them active (Ogungbile*et al*, 2002;Oloruntoba, 2000). Majority of the farmers (64.45%) were above the age of55 years. About 77.78% of the FFS farmers were males. The result reveals thatmore males are involved in cocoa farming. This may not be unconnected with the perennial nature of tree crops such ascocoa and oil palm which often leads to permanent holding on land which traditionally are owned by men. Solomon (2008) also reported this type of result for oil palm. Marital status showed that in the pooled category most of farmers are married as it had a frequency of 83.33%. While farmers that are single, separated, and divorced constitutes 8.89%, 6.67%, and 1.11% respectively. This may be an indication that marital status is an important factor in cocoa farming. According to Dikito – Watchtmeister (2001), marital status is a crucial factor in shaping social rural participation and acceptance. Farmers need a large family to reduce the cost of farm labour and maintain a relatively stable life style in the rural areaespecially for tree crop like cocoa. Majority (40%) of the respondents had one form of primary education or the other, while 27.78% had secondary education and, 18.89% hadno education, 12.22% attended tertiary education. Just 1.1% had post graduate education. This means that cocoa farming is dominated by the educated class with primary education. This is so because cocoa farming requires a lot of technical and scientific knowledge. The information on the innovations of cocoa farming is somehow complex and this need some high level of education to practice and the more educated an individual is, the easier it will be for him or her to decode and process information.The mean age of Cocoa trees of the respondents were 32.37 years, 29.75 years and 30.33 years in FFS, Non-FFS and the pooled category. Age of Cocoa Trees in South West States in Nigeria, it was noticed in the category that ispooled that age of cocoa trees that ranges 31-40 years had the frequency that is highest with 42.22%, followed by age of cocoa trees that ranges between 21 to 30 years with 27.78%, ranges of 11 to 20 years followed with 14.44%, 41 to 50 years was next with 12.22%, and lastly 0 to 10 years had 3.33% frequency. According to Alamu et al (2002) farmers with more resources including land are more likely to take advantage of a new technology. The finding agrees with that of Onemolease (2005), Okunlola and Adekunle (2000) Koyenikan (2002). The means of household size were 5.19, 5.37 and 5.27 in FFS, Non-FFS and the pooled category respectively. This can either be an asset or liability, if majority of the family

members are employable on the farms, they can be source of labour, if not higher amount of money is needed to maintain them, hence the lesser the investment capital available to the farmers as a result of low disposable income of farmers with large household size. Families with household size of 7 – 8 and 5-6 members had the highest frequency of 44.44% in the pooled category as revealed in Table 1, followed by household size of 9 – 10 members with 7.78% while families with household size of 2 – 4 members had the least frequency of 3.33%.Banmeke (2003) further asserted that household size is an important index inany rural development intervention which can affect the outcome of such intervention.

4.2. Factors Influencing Participation in Farmers Field School (FFS) in Osun State, Nigeria

The selection model was appraised using a maximum likelihood probit model. The result is reported in Table 2 shows that the selection model for Cocoa farmers in Ondo State result shows that the only significant determinant in FFS participations was age at significance level of 1%. In addition, only gender is correlated positively with the FFS participation probability. It should however be noted that FFS participation probability negatively correlated with extension, education andage.

4.3. Yield Regression Results for Ondo State

As depicted Table 3 yield regression results for Ondo state, model 1 OLS regression showed that land, labour, and fungicide lead to increases in cocoa yields at statistically significant levels. In looking at the elasticity terms, anincrease of one percent in available land resulted into a 0.72% increase cocoa yield increase at the mean and an increase of one percent in available labour resulted into 0.4% cocoa yield increase at the mean and lastly increase of one percent in available fungicide used lead to 0.18% cocoa yield increase. Despite this, the regressors are jointly statistically significant, because the overall F statistic value of 67.9. Simultaneously, the OLS estimate for participation in farmers field school in Ondo state had $R^2 = 0.802$ which shows that 80.2% of the variation in cocoa yield is accounted for.

In examining model 2 selection results which indicate that land, labour, and fungicide resulted into increase in cocoa yields at statistically significant levels. Assessing the result with respect to elasticity, an increase of one percent in available land was associated with a 0.44% increase cocoa yield increase at the mean, and an increase of one percent in available fungicide used lead to 0.56% cocoa yield increase. Exception to the model 1 is the invariant in sign, magnitude and significance of the inverse Mills ratio inclusion. The inverse Mills ratio coefficient 0.335 is significantly different from zero at 1% level of significance; its inclusion in the yield equation increases the explanatory power of participation variable of farmers' field school, proposing that the measured impact of cocoa productivity is not partly embodied in the characteristics associated with participation in farmers' field school. Therefore, hypothesis that farmers' field school participation effects are independent of the self-selection process is accepted with this model

5. Conclusion

Available empirical evidence from the study confirms the fact that impact of FFS participation was perceived as more effective in increasing cocoa productivity in Ondo state than the other extension approaches because it possesses all the features of participatory extension approaches. It was therefore recommended that FFS agricultural extension approach should be promoted in the studyarea.

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Age							
		FFS	**%**	**Non-FFS**	**%**	**POOLED**	**%**
[25 - 35)		0	0	1	2.22	1	1.11
[36 - 45)		3	6.67	3	6.67	6	6.67
[46 - 55)		7	15.56	18	40.00	25	27.78
[56 - 65)		17	37.78	17	37.78	34	37.78
[66 - 75)		18	40.00	6	13.33	24	26.67
TOTAL		45	100.00	45	100.0	90	100.0
Gender							
Female		8	17.78	12	26.67	20	22.22
Male		37	82.22	33	73.33	70	77.78
TOTAL		45	100.0	45	100.0	90	100.0
Marital Status							
Single		3	17.78	5	11.11	8	8.89
Married		37	82.22	38	84.44	75	83.33
Divorce Separated		1 4	2.22 8.89	- 2	- 4.44	1 6	1.11 6.67
TOTAL		45	100.0	45	100.0	90	100.00
Level of Education							
[0 - 5)		11	24.44	6	13.33	17	18.89
[6 - 10)		17	37.78	19	42.22	36	40.00
[11 - 15)		12	26.67	13	28.89	25	27.78
[16 - 20)		4	8.89	7	15.56	11	12.12
[20 - 25)		1	2.22	0	0	1	1.11
TOTAL		45	100.00	45	100.00	90	100.00
Age of Cocoa Trees							
[0 - 10)		0	0	3	6.67	3	3.33
[11 -20)		2	4.44	11	24.44	13	14.44
[21-30)		10	22.22	15	33.33	25	27.78
[31-40)		25	55.56	13	28.89	38	42.22
[41-50)		8	17.78	3	6.67	11	12.22
TOTAL		45	100.00	45	100.00	90	100.00
Size of Cocoa Plantation							
[0 - 5)		35	77.78	34	75.56	69	76.67
[6 - 10)		6	13.33	10	22.22	16	17.78
[11 -15)		3	6.67	1	2.22	4	4.44
[16-20)		1	2.22	0	0	1	1.11
TOTAL		45	100.00	45	100.0	90	100.00
Household sizes							
[2 - 4)		0	0	3	6.67	3	3.33
[5 - 6)		17	37.78	23	51.11	40	44.44
[7 - 8)		23	51.11	17	37.78	40	44.44
[9 - 10)		5	11.11	2	4.44	7	7.78
TOTAL		45	100.00	45	100.0	90	100.00

Table 1: Socio-economic Characteristics of the Respondents

	Dependent Variable:					
	FFS					
	(ekiti)	(Ondo)	(Osun)	(oyo)	(ogun)	(pooled)
Age	0.030	-0.068***	0.056**	-0.025	-0.057**	-0.019***
	(0.022)	(0.022)	(0.024)	(0.019)	(0.024)	(0.009)
Edu	0.186***	-0.042	0.204***	0.011	-0.009	0.043***
	(0.050)	(0.038)	(0.052)	(0.033)	(0.034)	(0.016)
Gender	-0.117	0.343	-0.376	0.318	0.162	0.130
	(0.420)	(0.435)	(0.450)	(0.393)	(0.415)	(0.180)
extension	-6.225	-6.415	-6.241	-6.314	-6.287	-6.188
	(299.862)	(335.205)	(302.075)	(312.288)	(325.363)	(148.451)
Constant	2.706	10.083	1.439	6.893	9.032	6.428
	(299.866)	(335.209)	(302.078)	(312.291)	(325.366)	(148.452)
Observations	90	90	90	90	90	450
Log Likelihood	-35.693	-42.177	-34.632	-39.964	-41.172	-212.401
Akaike Inf. Crit.	81.386	94.354	79.265	89.929	92.344	434.802

Table 2: Selection Regression Result for Pooled Data in South West States of Nigeria.
****, ** And * Represents 1%, 5% And 10% Significant Levels Respectively*

	Dependent Variable:	
	Log(yield)	
	OLS	Selection
	(1) t	(2) t
log(land)	0.724 6.523***	0.435 2.364***
	(0.111)	(0.184)
log(labour)	0.398 2.457**	0.448 1.623*
	(0.162)	(0.276)
log(tree)	0.075 1.027	-0.079 -1.013
	(0.073)	(0.078)
log(herbicide)	0.090 1.011	-0.083 -0.539
	(0.089)	(0.154)
log(fungicide)	0.175 1.768*	0.561 3.188***
	(0.099)	(0.176)
Constant	3.811 5.034***	4.010 2.979***
	(0.757)	(1.346)
Observations	90	90
R^2	0.802	
Adjusted R^2	0.790	
Rho		1.066
Inverse Mills Ratio		0.335 (0.084) 3.988***
Residual Std. Error	0.272 (df = 84)	
F Statistic	67.901*** (df = 5; 84)	

Table 3: Yield Regression Result Ondo State of Nigeria.
****, ** and * Represents 1%, 5% and 10% Significant Levels Respectively*