EFFICIENCY OF INNOVATION UPTAKE AMONG COCOA FARMERS IN ONDO STATE, NIGERIA

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Agricultural Policy Research in Africa



Outline

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- Methodology
- Results and discussions
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Introduction

- Agricultural sector in Nigeria was the most important in terms of contributions to GDP in the 1960s.
- Nigeria was once the second leading producer of cocoa in West Africa (Samuel, 2017).
- Currently the country is ranked fourth with production of 255, 000 metric tons during 2017/2018 season (International Cocoa Organization, 2019).
- Nigeria's share of global production has declined as a result of the poor utilization efficient production processes in combination with poor adoption of technology.



Introduction

Unlike Nigeria, other countries utilize improved inputs and technologies to increase their production levels (PWC, 2017).

- The use of technology and better inputs are expected to play an increasing role in raising agricultural productivity (Fuglie and Rada, 2013).
- Innovation uptake is dependent on the capacity of the user to access innovation and later use it.

Mere provision of information to farmers does not guarantee its use.



Introduction

The objectives of this study were to:

estimate the cost and returns of cocoa production among adopters and non-adopters of disseminated improved cocoa technologies.

• determine the technical efficiency of cocoa farmers in the study area.



Methodology

- ► The study was conducted in Ondo State, Nigeria.
- Located between latitude 7°10¹ North of the Equator and longitude 5°05¹ East of the Greenwich meridian.
- Comprises of 18 LGAs.



Methodology

- A multi-stage sampling technique was employed in the collection of data.
- In the first stage, two local government areas, Idanre and Ondo East were randomly selected.
- The second stage involved random selection of three villages from each LGA giving a total of six villages.
- In the last stage, two sets of farmers: adopters and non-adopters with each set comprising of 10 farmers were randomly selected from the selected villages making a total of 120 cocoa farmers.



Methodology

- Data were collected using structured questionnaire with the aid of trained enumerators.
- The data were analyzed using budgeting technique and stochastic frontier production function (SFPF).
- NFI = GR TC(1) The model for the estimation of the TE is specified as:
 - - $U_{1} = \delta_{0} + \delta_{1}Z_{1} + \delta_{2}Z_{2} + \delta_{3}Z_{3} + \delta_{4}Z_{4} + \delta_{5}Z_{5} + \delta_{6}Z_{6} + \delta_{7}Z_{7} + \delta_{8}Z_{8} + \delta_{9}Z_{9} + \delta_{10}Z_{10} + \delta_{11}Z_{11} + \delta_{12}Z_{12} + \delta_{13}Z_{13} + \delta_{14}Z_{14} + \delta_{15}Z_{15} + \delta_{16}Z_{16} + \delta_{17}Z_{17} \dots (3)$

Results and discussions

- Socio-economic characteristics of the farmers:
- cocoa farms are predominantly operated by males (65%) and married.
 - mean: age of 51 years, 6 years of education, 21 years farming experience, household size of 6 members, and farm size of 6 hectares.
- Uses more of personal funds and is aware of new cocoa technologies but rarely adopts the innovations.



Table 1: Estimated Cost and Returns analysis for Adopters and Non-adopters of the disseminated cocoa technologies in the study area

Cost items and revenue (NGN/Ha)	Adopters	%	Non-adopters	%
Variable cost				
Labour cost	6,122.97	11.02	14,585.88	36.32
Seedling	4,901.42	8.82	1,773.84	4.42
Agrochemicals	12,884.17	23.18	8,223.95	20.48
Fertilizer	31,668.67	56.98	15,576.13	38.79
Total variable cost	55,577.23		40,159.80	
Fixed Cost				
Farm tools (depreciation)	7,380.80	12.94	2,170.70	6.00
Interest on loan	16,847.75	29.53	10,673.60	29.55
Land	32,831.33	57.54	23,281.60	64.45
Total fixed cost	57,059.88		36,125.90	
Total Cost	112,637.11		76,285.70	
Returns				
Total revenue	293,567.91		192,036.22	
Net farm income	180,930.80		115,750.52	
Gross ratio	0.38		0.40	
Operating ratio	0.19		0.21	

Source: Data Analysis, 2013



Variable	Parameter	Coefficient	T- value
Constant (beta)	βo	2.696	3.904***
Agrochemicals	βι	0.056	0.328
Fertilizer	β_2	0.778	2.653**
Size in ha	β3	-0.050	-1.164
Depreciation	β4	0.574	5.829***
Labour input in man days	β ₅	0.019	2.159**
Seedling in number	β ₆	-0.001	-1.167
Constant (delta)	$\dot{\delta}_0$	-2.619	-1.755*
Age	δ_1	-1.626	-1.863*
Sex	δ_2	1.450	1.448
Marital status	δ3	5.973	3.548***
Educational status	δ4	-2.370	-2.378**
Membership of farmer org.	δ5	-1.586	-1.635*
Access to credit	δ_6	-0.699	-0.711
Dist. of farm to home stead	δ7	0.179	2.995***
Household size	δ_8	-0.762	-1.857*
Method of land acquisition	δ9	-1.587	-1.292
Nature of access road	δ_{10}	3.209	2.612**
Amount of rent	δ_{11}	-0.032	-0.290
Av. dist. to home in km	δ12	0.296	1.159
Av. dist. to market in km	δ ₁₃	-0.077	-0.612
Av. time taken from home	δ_{14}	-0.067	-1.554
Adoption status	δ15	-4.608	-3.049***
Formal education in years	δ_{16}	-0.102	-0.959
No. of children	δ17	0.724	1.459
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Table 2: Maximum Likelihood Estimates of Parameters of the Cobb-Douglas Frontier Function

 Table 2: Maximum Likelihood Estimates of Parameters cont'd

Diagnosis statistics

Sigma-square $(\delta^2 = \delta u^2 + \delta v^2)$ Gamma $(\gamma = \delta u^2 / \delta^2)$ log likelihood function LR test of the one-sided error Average = TE 8.627 0.486 -275.6399 38.2408*** 0.4123

6.785*** 3.499***

Note: ***, ** and *implies statistical significance at P<0.01, P<0.05 and P<0.10 probability levels respectively. Source: Field survey, 2013.



Efficiency Class Index	Frequency	Percentage
0.00-0.10	18.00	15.00
0.11-0.20	12.00	10.00
0.21-0.30	16.00	13.30
0.31-0.40	13.00	10.80
0.41-0.50	13.00	10.80
0.51-0.60	17.00	14.20
0.61 - 0.70	13.00	10.80
0.71 - 0.80	15.00	12.50
0.81-0.90	3.00	2.50
Total	120.00	100.00
Mean (%)	0.41	
Minimum (%)	0.02	
Maximum (%)	0.82	

Table 3: Frequency distribution of technical efficiency indices among cocoa farmers

Source: Field survey, 2013



Conclusion

- Adopting disseminated cocoa innovations was profitable in the study area.
- The technical efficiency of the farmers varied due to the presence of technical inefficiency effects of not adopting new and improved cocoa technologies.
- The study further concludes that marital status, distance of farm to homestead and nature of access road decrease the farmers' technical efficiency while age of cocoa farmers, educational status, membership of farmers' organization and adoption status of cocoa farmers increases their technical efficiency.



Recommendations

Farmers should be encouraged to join farmers organisations which will increase their awareness of new cocoa technologies.

There is need for government and other stakeholders to invest in extension services in sensitizing cocoa farmers of new innovations, as this has the potential to increase adoption rate as well as farmers' productivity, efficiency and income.





FOR YOUR ESTEEMED ATTENTION

