



Introduction

The productivity of smallholder cocoa farmers in West and Central Africa is between 300 – 700kg/ha, which is lower compared to South East Asia and South America (1600kg/ha). The major causes of low productivity and efficiency among West and Central African cocoa farmers is attributed to low soil fertility, poor agronomic practices and low adoption of new technologies. Most cocoa farmers lack the needed technical knowhow on prudent and specific agronomic practices to adopt to gain a specific output in farm production. Therefore, research into new technologies and innovations and its related adoption is eminent. This will contribute to solving the primary concern of low yield and challenges such as low soil fertility and poor agronomic practices among cocoa farmers.

Objective of study

This study sought to find out factors that influence the adoption of agronomic practices (Chemical Fertilizer, Organic manure, Sanitary Pruning, Structural Pruning, Manual Weeding, Pest Management, Disease Management, Shade Management) among smallholder cocoa farmers in West and Central Africa

Materials and Methods

- The baseline data from the CocoaSoils-Sustainable intensification of cocoa production through the development and dissemination of Integrated Soil Fertility Management (ISFM) options program which was collected from 3280 cocoa farmers across Cameroon, Cote d'Ivoire, Ghana and Nigeria was used for this analysis
- The study adopted a multistage stratified random sampling technique to ensure a representative sample of cocoa farmers were selected.
- First, the study areas were purposively sampled based on project partner operational areas, which were stratified according to agro-ecological zones and the sample size proportionately distributed among partners according to number of farmers submitted for the survey.
- In all, a total of 3280 cocoa farmers were interviewed across the various agro ecologies in Cameroon, Cote d'Ivoire, Ghana and Nigeria
- The multivariate probit model was used in analyzing the joint factors that influence the adoption farm management practices among smallholder cocoa farmers

Table 1: Method of Village and HH selection

Variable	Treated
Agro Ecological Zones	X_Z
Number of states/regions	X_T
Number of LGAs/districts per state/region (operated by partners)	Y_T
Number of partner villages per LGA/district	NPV
Number of villages for CocoaSoils activities	Z_T
Number of HH per village (based on partner dissemination approach)	n_T
Total sample size	$N_T = X_T * Y_T * NPV * Z_T * n_T$

Results and Discussion

Results show that, perception of low soil fertility has a positive and significant level of influence on adoption. Higher income from cocoa motivates farmers to re-invest and adopt. Membership to farmer-based organizations allows access to better extension and influence adoption. When there is more labour available to support labour intensive management practices, likelihood for adoption is higher. The more experienced a cocoa farmer is, the more they are knowledgeable about the timing and intensity of management practices. Being a male farmer makes you more likely to influence decision and have more access to resources than women hence more likely to adopt farm management practices. Statistically, perception of low soil fertility increases the likelihood of adoption in Cameroon, educational level increases the likelihood of adoption in Cote d'ivoire, availability of labour increases the likelihood of adoption in Ghana and membership of farmer-based organization increases the likelihood of adoption in Nigeria (Table 2).

Table 2: Multivariate probit regression results

Variables (Cameroon)	Chemical fertilizer	Organic fertilizer	Disease management	Shade management
Sex	0.78	0.70	0.37	-0.59
Age	-0.16	-0.09	0.36	0.82
Educational Level	0.32	-0.91	0.75	-0.74
Cocoa farming experience	0.95	-0.75	0.78	-0.25
Membership of FBO	0.21	0.40	0.00***	0.02
Land ownership	-0.32	0.97	-0.96	-0.42
Labour availability	-0.36	0.46	0.00***	0.00***
Perception of Soil fertility	0.29	-0.37	0.00***	0.01*
Livelihood diversification	0.27	-0.93	-0.76	0.91
Income from cocoa	-0.56	-0.11	0.00	-0.36
Variable (Cote d'Ivoire)	Chemical fertilizer	Organic fertilizer	Disease management	Shade management
Sex	0.05	0.75	-0.30	0.58
Age	-0.42	0.65	0.97	0.74
Educational Level	-0.27	0.32	0.04*	0.99
Cocoa farming experience	0.73	-0.76	0.53	-0.97
Membership of FBO	-0.78	-0.75	-0.20	0.08
Land ownership	-0.38	-0.79	0.56	-0.98
Labour availability	-0.13	-0.06	-0.07	-0.99
Perception of Soil fertility	0.05	0.19	0.89	0.98
Livelihood diversification	0.00***	0.11	-0.74	0.01*
Income from cocoa	0.00***	0.00***	0.01*	0.06
Variable (Ghana)	Chemical fertilizer	Organic fertilizer	Disease management	Shade management
Sex	0.01	0.30	0.20	-0.51
Age	-0.21	-0.03	-0.07	0.72
Educational Level	0.01*	-0.91	-0.87	0.51
Cocoa farming experience	0.00***	0.43	0.11	0.41
Membership of FBO	-0.38	-0.55	-0.13	-0.33
Land ownership	-0.72	0.86	0.07	0.00***
Labour availability	0.00***	0.03	0.01	0.00***
Perception of Soil fertility	-0.34	0.74	0.85	-0.01
Livelihood diversification	0.15	0.19	-0.76	-0.25
Income from cocoa	0.00***	0.28	0.00***	-0.30
Variables (Nigeria)	Chemical fertilizer	Organic fertilizer	Disease management	Shade management
Sex	0.78	-0.74	-0.66	0.29
Age	-0.29	-0.52	0.37	-0.76
Educational Level	0.04*	0.70	0.10	-0.30
Cocoa farming experience	0.39	0.34	-0.18	-0.32
Membership of FBO	0.97	0.03	0.00***	0.01*
Land ownership	0.24	0.13	0.22	-0.01
Labour availability	-0.19	0.86	0.14	0.00***
Perception of Soil fertility	0.19	0.54	0.69	0.09
Livelihood diversification	-0.51	0.10	0.70	0.75
Income from cocoa	-0.83	0.00***	0.01	0.87

Conclusion

The factors that influence adoption of farm management practices are labour availability, educational level of farmers, membership of farmer group, perception of soil fertility and productivity among West and Central African cocoa farmers.

Recommendation

Policy design to enhance adoption of farm management practices must be targeted at addressing gender equity, labour supply, farmer co-operative formation, soil fertility and productivity among West and Central African cocoa farmers to contribute to an increase in farmer income.

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