International Journal of Agriculture and Environmental Research

ISSN: 2455-6939

Volume: 07, Issue: 04 "July-August 2021"

EFFECT OF FARMER BUSINESS SCHOOL ON COCOA PRODUCTION IN THE SEFWI JUABOSO DISTRICT OF GHANA

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DOI: https://doi.org/10.51193/IJAER.2021.7406

ABSTRACT

Farmer Business School (FBS) which is a component of the specialized extension system of Ghana Cocoa Board was introduced to ensure sustainable and profitable cocoa production among farmers. The program has been on the run for ten (10) years now however, there is a paucity of empirical studies to show the effect of it on cocoa production. This study explore this gab in the Sefwi Juaboso District of Ghana using case study design involving multi-stage sampling procedure to select 100 (50 Farmer Business School participants and 50 non-participants of Farmer Business School) farmers for the study. Findings of the study established that farmers are highly interested in the program. FBS Participants are making higher yield with superior quality cocoa beans than Non-FBS participants. It is recommended therefore to COCOBOD and other stakeholders to adopt measures to promote participation of farmers in FBS so that the country can maintain its position on the world level in terms of yield and quality.

Keywords: Farmer Business School (FBS), Cocoa farmers, Cocoa production, Ghana.

INTRODUCTION

Cocoa farming is a major business in Ghana Mohammed, et al., (2012). The activity generate livelihood for millions of people Laird et al., (2007). The increasing demand for cocoa and the emerging food security issues throw the challenges for increasing yield and quality of cocoa in order to keep-up with the demand while not damaging the health of consumers Fold, (2001). Numerous efforts to increase yield and quality cocoa continue to be roll-out by cocoa sector stakeholders Schroth & Harvey, (2007). One of these efforts that need a careful study is the Farmer Business School Concept. The concept that seek to promote business consciousness

ISSN: 2455-6939

Volume: 07, Issue: 04 "July-August 2021"

among farmers so that they can adhered to best agronomic practices to ensure profitable cocoa farming gain grounds in Ghana since 2010 (Bingen et. al., 2003; Yaro, 2013).

Ghana is the second largest cocoa producing country in the world (Rifin, 2013). The country continues with efforts to maintain or even improve on its current position (Rifin, 2013). In the vain of these efforts comes with free inputs for farmers and comprehensive extension delivery. The extension system tries to instill business consciousness in farmers and as well promote sustainable cocoa production through the Farmer Business Education. Sefwi Juaboso Distrct, one of the largest cocoa production regions in Ghana, generating 10% of Western Region's total cocoa production is well dominated with the cocoa extension and its farmer business training (David & Asamoah, 2011).

The increasing demand by global cocoa processors for premium quality that is produced in a sustainable manner makes the Farmer Business Education very inevitable (Adams, 2006; Laven, 2010). Though some farmers do not avail themselves of the programs, other Ghanaian cocoa farmers have embraced the Farmer Business education Program (David & Asamoah, 2011). The education section is organized for cocoa farmers registered farmers in their respective communities. The effect of the Farmer Business School on the yield and quality of cocoa remains a mystery (David & Asamoah, 2011). A thorough comparative study measuring the yield and quality of cocoa produced by Farmer Business School participants as against that of nonparticipants in Farmer Business School is therefore necessary for ascertaining the success or otherwise of the program (Dormon et. al., 2004).

MATERIALS AND METHODS

Profile of Sefwi-Juaboso District

The Juaboso District was created out of the Sefwi Juaboso District in 1988 with Legislative Instrument (LI) 1473 (Boateng, 2012). The district has a surface area of about 1,284 square kilometres and serves as an entry/exit point between La Cote d'Ivoire and the Republic of Ghana (Knudsen & Fold, 2011). It has a population of about 86,574. It is located in the northern part of the Western Region of Ghana with Sefwi Juaboso as its capital (Knudsen & Fold, 2011). The district shares borders with Bia West and Asunafo North districts in the North, Asunafo South and Bodi districts to the East, and Suaman District to the south and la Cote d'Ivoire to the West (Boateng, 2012).

Agriculture is the main economic activity in the District. Endowed with Forest Ochrosols and Oxysols soil which is best for cocoa production, the District generates an average of 30,009.14 tonnes of cocoa annually (Boateng, 2012). About 75% of the workforce in the district is engaged in cocoa farming (Knudsen & Fold, 2011).

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The undulating landscape giving an altitude ranging from 152 to 510 meters above sea level with numerous rivers and streams that drain the area makes the District best for cocoa farming (Boateng, 2012). The District falls within the Tropical Rainforest Climatic Zone, with annual temperatures ranging from 25^{o} C to 35^{o}C and annual rainfall between 1500mm and 1800mm (Knudsen & Fold, 2011). The District experienced two long wet seasons separated by a short and relatively dry season (Vordzogbe et al., 2005). With relative humidity of 90 percent at night and 75 per cent during the day, the dry season is usually characterised by relatively low humidity, but relatively higher during the rainy season (Project Novella, 2003). The vegetation is mostly of Moist, Semi-Deciduous type with important timber species as Odum, Mahogany, Sapele and Wawa (Vordzogbe et al., 2005). These weather conditions and the vegetation as well make the District ideal for cocoa production (Vordzogbe et al., 2005).

Research design

The interest of this study was obtained from the preliminary investigation require a research design that will allow multi-perspective or holistic exploration of the issue especially within a specified sector like the cocoa sector as such a case study design (one of the comprehensive designs) was adopted for the study. According to Gerring, (2013), a case study which is a specific method of analyzing a problem of a specified population, provides deep illumination into complex issues within complex systems with good grounds for generalizing the findings across the specified population.

The case study design adapted here makes use of questionnaire survey, interviews and physical quality tests such as cut-test, bean count, moisture test and uniformity test to provide a broader assessment of the effect of farmer Business School on cocoa production in the Sefwi Juaboso District of the Western Region of Ghana. Conclusions of the study are grounded in the results of the study and thus avoid speculations.

Method of data collection

A multi-stage sampling procedure that includes purposive and simple random sampling techniques were employed for the study. The sampling was done in the following stages:

Stage 1: Purposive sampling technic which allows the selection of elements that generate relevant inputs (Sounders et al. 2009) was used to select the Sefwi Juaboso District for the study. The District was selected purposively because it is one of the leading cocoa producers contributing about 10 % of the western region's production and has been running Farmer Business School since 2010.

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Stage 2: A list of cocoa-growing communities within the District was obtained from the Cocoa Health and Extension Division's office within the District. The names of the communities were randomized with textfixer's random generator software to generate three (3) communities namely; Sayerano, Juaboso and Bonsu Nkwanta for the study. The textfixer's random generator is simple random sample software. The simple random sampling was adopted in this stage and stage 3 because the unit of analyses share similarity (cocoa production) since it (simple random sampling) is the most efficient tool for analyzing elements with similar characteristics.

Stage 3: A list of 450 (including FBS and Non-FBS participants) cocoa farmers in the three communities selected in stage 2 was obtained from the Cocoa Health and Extension office within the District. The names of the farmers were randomized with textfixer's random generator software to select 100 (50 Farmer Business School participants and 50 nonparticipants of Farmer Business School) farmers for the study. Arrangements were done with the selected farmers such that questionnaires were administered and cocoa samples (600 grams of beans were obtained from the beans of each of the selected farmers) taken from them.

Stage 4: The samples from the two farmer categories obtained in stage 3 were bulked and reduced to a workable sample of 700 grams through thorough bulking and quartering. 300 beans of the resultant work sample for each lot were cut lengthwise except for germinated beans which were cut breadthwise with sharp knives and physical observation was done on them to determine the defects and purity of the beans of each group. Another 300 grams of beans from each sample group were also weighed in a sub-lot of 100 grams with a cocoa scale. The weighed 300 grams beans in 100 grams lots were counted and the average bean count was expressed per 100grams. The uniformity index of the sample was determined by visually sorting the unusual beans from the 300 gram weighed beans and striking the percentage of such by the use of a scientific calculator. For the moisture test, a cup electrode Aquaboy (a moisture meter) was used to determine the moisture content of the beans. The process is such that 10 beans were loaded into the cup of the aquaboy and the reading button was clicked to indicate the moisture content of the beans after the cup is well closed. This was done three times and the average moisture reading was taken for each sample group.

Stage 5: Purposive sampling was used to select and interview the District Extension officers. , 1 QCC officer (the district head) and 2 transporters. The officer was believed to have in-depth knowledge about the farmer business school and cocoa production in the District hence his selection.

Data Analysis

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For the analyses, the quantitative data were analyzed with SPSS version 20.0 and Minitab-16 to produce frequency distribution tables. The choice of this software is based on the fact that they allow varied exploration of data and generate accurate results for informed judgement (Bartlett et al., 2001). Analyses of the quantitative data obtained from farmers surveys and the physical assessment of beans provide the basis to infer yield and quality issues in the cocoa sector of the District. The findings from the farmers' surveys and the physical quality assessment of sampled cocoa beans obtained from the selected farmers were validated during a meeting with District Extension Officer.

RESULTS AND DISCUSSIONS

Farmers' perception and interest in the Farmer Business School programs

Perceptions drive human attitude and so the best way to explain certain human behaviour is to first investigate the viewpoint they hold in anticipation. Farmers are rational people whose acts are usually backed by pre-conceived views. This section of the analysis seeks to provide understanding to cocoa farmers' perception of the Farmer Business School concept.

Table 2: Respondents perception of Farmer Business School

Perceptions	Responses	Percentage
FBS is very good	No	4
	Yes	54
	Uncertain	42
FBS lessons promote profitable production	No	0
	Yes	62
	Uncertain	38
FBS is a waste of time	No	51
	Yes	39
	Uncertain	10
I am highly interested in FBS programs	No	38
	Yes	62
	Uncertain	0

Source: Field data 2021

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The farmers have a positive perception about FBS and this is made clear with majorities (54%) response that the FBS is very good while 62% and 51% respectively affirms that FBS promote profitable production and participation in the program is never a waste of time. 62% of the respondents express high interest in the FBS program while 38% of the respondents are not interested in the program

Effect of Farmer Business School on cocoa yield.

The main purpose of FBS as stated in the first chapter of this study is to equip farmers with requisite business knowledge that will enable them to make gains in farming. This section of the analysis conducts a simple comparison to determine the effect of the FBS on cocoa farms' output (in tonnes)

Table 3: Effect of Farmer Business School on cocoa yield

Category	Frequency	Average Expenses/Ha (GH₵)	Average Yield/Ha (tonne)
FBS Participants	50	3000	1.0000
Non-FBS Participants	50	2000	0.5625

Source: Field data 2021

Table 3 shows FBS Participants investing more in the same size of land than the Non-FBS participants. The FBS Participants farms are yielding almost double the yield of the Non-FBS participants'. This shows that FBS participants see farming as a business and therefore put in the right investment and are thus generating enough gains.

Effect of Farmer Business School on cocoa quality

Cocoa production is not just about to yield, the quality of the beans affects the price and the demand for the bean. Table 4 was constructed after a physical quality analysis of cocoa beans obtained from FBS participants and Non-FBS participants. The separate analyses of beans from these categories of farmers allow a proper assessment of the FBS program.

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Table 4: Category of farmers and their bean quality

		Physical analyses				Cut-test Analyses (%)						
Category	**Frequency**	Moisture (%)	F/M (%)	Average bean count/100g	Uniformity Index (%)	Mouldy Beans	Slaty beans	Germinated beans	Weevil infested	Other defects	Percent purity	Grade
FBS Participants	50	6.8	0.000	88	13.2	0.3	1.0	0.7	0.0	0.0	98.0	I
Non-FBS Participants	50	9.5	3.000	104	12.0	2.0	9	6	0.0	0.0	83.0	SS
All put together	100	7.4	0.200	100	12.3	0.7	1.3	1.0	0,7	0.0	96.3	I

Source: Field data, 2020

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The moisture content of the beans from FBS participants was within the permissible limit (between 0.0-to-7.5) but high (9.5%) for the Non-FBS participants' sample. Foreign matter including bean placenta was high up to 3% (3grams per 300grams of beans) for beans from Non-FBS participants. Beans from FBS participants were without foreign matter. A combination of beans from the two categories of farmers shows a lower foreign matter content (0.2%).

On bean count, FBS participants farmers produce heavy beans (88 beans per 100grams) compared to Non-FBS participants (104 beans per 100grams). Though bean weight is largely attributed to plant variety, climatic conditions and harvesting time, post-harvest practices such as delayed pod breaking and fermentation also affect beans' weight. The science behind this is that sugar breakdown continues until the beans get dried and so any undue delay will lead to excess loss of sugar which usually gives weight to the beans.

The uniformity index was high for beans from all the categories even for the combined beans. A follow-up on some of the farmers from the various categories shows that none of them segregates their cocoa according to size. The cut-test results show that FBS participant farmers produce premium quality beans with 98% purity while Non-FBS participants are producing substandard cocoa with 83% purity. When the beans from the two categories of farmers were bulked and examine as a single sample, the cut-test result was of premium quality. This means that beans quality may reduce if the FBS participants' population or production from the Non-FBS participants dominates that of the FBS participants. Again this finding confirms Mbonomo et al, (2016) assertion that some farmers are short-cutting recommended agricultural practices.

ANOVA Analysis

Exploring the data in table 4, analyses of variance were conducted with the percent purity of the beans from the various categories as examined. This analysis was conducted to determine whether significance exist (in terms of beans produced) among the two categories of cocoa farmers within the Sefwi-Juaboso District. Table 5 displays the ANOVA result.

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Table 5: ANOVA: Category of farmers and their bean quality

Source	DF	SS	MS	F	P
Factor	2	404.78	202.39	51.11	0.000
Error	6	23.76	3.96		
Total	**8**	**428.54**			

Significant level = 0.05

The ANOVA analysis shows a larger F-value of 51.11 and a smaller P-value of 0.000 (less than 0.05). These observations (P= 0.000 and F=51.11) indicate inconsistency with the obvious Null hypothesis and hence the rejection of the null hypothesis: "FBS have no significant effects on the physical quality of cocoa beans". The alternative hypothesis "FBS have significant effects on the physical quality of cocoa beans" is however upheld. This finding confirms the assertion of Afoakwa et al., (2012) that bean quality is reduced when recommended practices are not adhered to.

KEY FINDINGS

The study shows that farmers have a positive perception of the Farmer Business School concept and are highly interested in it. The study also reveals higher investment and higher yield per field of the same size of land by FBS Participants than Non-FBS participants. From a beans quality perspective, FBS have significant effects on the physical quality of cocoa beans

CONCLUSION

It can be concluded that Non-FBS participants are deviating from recommended post-harvest practices hence producing low yield and poor quality cocoa beans. While the FBS participant farmers are investing recommended cash and effort and are hence generating higher yield and premium quality beans. Ghana's cocoa yield and quality will therefore reduce if measures are not taken to ensure farmers adherence to recommended agricultural practices.

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