



Drivers of Financial Inclusion among Cocoa Producers in the Southwest Region of Cameroon

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Research Article

Abstract

Purpose: Financial inclusion can considerably promote cocoa production and provide a buffer for the escape from poverty traps for cocoa-growing economies like Cameroon. However, the Southwest region of Cameroon still experiences a low level of cocoa production and poverty primarily due to financial exclusion. This article explores the drivers of financial inclusion in the region.

Method: A stratified multistage sampling technique was used to survey 380 cocoa producers in the main cocoa-producing areas in the region through semi-structured questionnaires. Descriptive statistics were used to analyze the socio-economic variables and the probit model to analyze the drivers of financial inclusion, subject to the three major dimensions of financial inclusion; access to, use, and quality of financial services.

Results: On average, the long distance of financial institutions (9.3 km), intermediate farm sizes (2.6 ha), and low annual income (1,125,863 FCFA) negatively influenced financial inclusion resulting in just 16.6% of farmers being financially included. The findings also revealed that financial inclusion is significantly enhanced by an increase in income, farm training, the closeness of formal financial institutions (FFIs), larger household size, and small-scale production at a 1% significance level, and more years of farming experience at 5%. Moreover, 51.3% of the major constraints to financial inclusion were accounted for by lack of collateral security, distant FFIs, and low income.

Implications: Reducing the distance of FFIs by establishing more institutions with considerations on collateral, increasing income through extension services like farm training, and sound agronomic practices will enhance financial inclusion.

Originality: The uniqueness of this study lies in the context of the socio-political crisis during which cocoa producers were interviewed and exploring how the crisis influenced financial inclusion through a host of factors. Moreover, besides just access to credit as considered by most studies in Cameroon, the current study considers the use and quality of formal financial services as well.

Keywords: Financial Inclusion, Cocoa Producers, Drivers, Formal Financial Institutions, Cameroon.

1. Introduction

Globally, emphasis is being laid on financial inclusion as a foundation for the economic development of most economies (Desalegn & Yemataw, 2017; Amoah *et al.*, 2020; Mhlanga *et al.*, 2020). Financial inclusion is a global target for 8 of the 17 sustainable development goals (SDGs), primarily among which are SDG1 on eradicating poverty; and SDG2 on ending hunger, achieving food security, and promoting sustainable agriculture (IFAD, 2016). Many of the issues faced by farmers, such as low yields, low income, poverty, and inequality, are primarily a result of financial exclusion (Adeola & Evans, 2017;

Fowowe, 2020; Akanbi *et al.*, 2020). According to Bonnieux (2019), there is a worldwide deficit of over USD 150 billion between the supply and demand of credit among cocoa producers who are mostly smallholders (90%) of less than 5 ha resulting in low income and inability to produce in the future. Consequently, financial inclusion is essential in enhancing smallholder farmers' access and use of formal financial services (FFSs) that will increase the level of cocoa production, reduce poverty and guarantee more inclusive social and economic growth (Demirgüç-Kunt *et al.*, 2018; Olaniyi, 2017).

During the 2018/2019 season, Africa contributed about 77% of the 4.8 million tons of cocoa produced worldwide (ICCO, 2019). Cameroon contributed about 4.6% and is ranked fifth after Ivory Coast (39.8%), Ghana (21.1%), Indonesia (9.8%), and Nigeria (5.5%) (ICCO, 2020). Also, cocoa is Cameroon's second top export commodity with a 12.4% contribution to GDP after petroleum with 36.3% (ITA, 2021). According to Business in Cameroon (2021), the Southwest Region is one of the main cocoa-producing regions in Cameroon, with a 31.6% contribution to total production, and is ranked second after the Centre region (43.6%). Unfortunately, the Southwest region lost its first spot in 2018 to the Center region partly due to financial exclusion as a result of the socio-political crisis in the area that pushed most of the formal financial institutions to shut down/relocate (Lescuyer *et al.*, 2020). Mukete *et al.* (2018) equally revealed that the lack of technical assistance and access to finance is a major hindrance to cocoa production that caused the Southwest region to lose its first spot to the Center region. Also, Martey *et al.* (2015) and Akram *et al.* (2013) further depicted that, farmers are technically inefficient because of inefficient use of inputs and technology due to untimely credit services with unaffordable terms and conditions.

Sadly, the level of financial inclusion in the Southwest Region (SWR) and Cameroon at large is still very low (Omar & Inaba, 2020). Compared to other Sub-Saharan African countries as a whole, Cameroon falls short by 2.8% in terms of bank branches per 1,000 adults, 8% in terms of account ownership, 5.9% in terms of financial institutions, 4% in terms of formal savings, and rather 7% more in terms of formal borrowing (World Bank, 2018; Hunguana *et al.*, 2020). This is driven by the fact that financial inclusion has not yet been taken too seriously in Cameroon. For example, the report released by the Worldwide Association of Central Banks in 2015 did not list Cameroon amongst other nations with national financial inclusion strategies nor did the annual report by the Bank of Central African States (BEAC) in 2018 refer to any (Hunguana *et al.*, 2020). Hence, only about 40% (urban areas) and 17% (rural areas) of farmers in Cameroon had access to FFSs in 2019 (Doh, 2020). Omar and Inaba (2020) underscored that the low level of financial inclusion, therefore, is a result of limited or no access to FFSs, unavailability, and/or non-use of such financial services.

Demirgüç-Kunt and Klapper (2013) measured financial inclusion through variation in the use of financial services across and within countries and revealed that formal account ownership serves as an entry point into the formal financial sector. Thus, bank accounts, savings, and credit highlight the distinction in various countries' levels of financial inclusion. The main determinants of financial inclusion revealed so far in African countries are; age, education, financial literacy, income, internet connectivity, gender, residence area, employment status, marital status, household size, degree of trust in financial institutions, and particularly income and level of education (Soumaré *et al.*, 2016; Zins & Weill, 2016; Abel *et al.* 2018; Gautier *et al.*, 2020). Furthermore, Crisil Inclusix (2014) and Chattopadhyay (2011) stated that lack of awareness and illiteracy are the factors that lead to low demand for banking services and consequently surface as the main reasons for financial exclusion. Thus, education and financial literacy have been identified as major influencers of financial inclusion (Ndoya & Tsala, 2021). Also, most credit providers require collateral which a majority of the smallholder farmers lack (Robinson, 2013; Razavi, 2014; Shillie *et al.*, 2022).

Financial inclusion is multidimensional and involves measurements such as access to, use, and quality of FFSs in terms of account ownership, formal borrowing, and formal saving (Chakravarty & Pal, 2013; Demirgüç-Kunt *et al.*, 2013). However, previous studies in Cameroon have rather focused on the constraints of and access to credit (Nchinda & Kamdem, 2020; Bin *et al.*, 2021; Mukete *et al.*, 2021;

Atamja & Yoo, 2021; Shillie *et al.*, 2023) and account ownership (Gautier *et al.*, 2020) without necessarily focusing on the multidimensionality of financial inclusion. Consequently, there is limited literature to underpin the extent to which cocoa producers, especially the vulnerable groups like the poor, women, and youths in Cameroon are financially included amidst the socio-political crisis plaguing the SWR that has caused production level to fall due to financial exclusion as a result. Thus, this study aimed at determining the drivers of financial inclusion among cocoa producers in the SWR of Cameroon. The remainder of the paper is divided into the following headings: methodology (section 2), results and discussion (section 3), conclusion and recommendations (section 4), and then limitations and direction for further study (section 5).

2. Methodology

2.1 Study area

This study was carried out in the Southwest Region (SWR) of Cameroon. The SWR is English-speaking and is bordered by Nigeria to the West, the Atlantic Ocean to the South, the Northwest region to the North, and the Littoral and West regions to the East (Figure 1). Situated above the equator between latitude 2° and longitude 6° N (Chambon & Mokoko, 2015), the region covers a total surface area of 25,410 km² and a population of 1,553,300 inhabitants across a diversity of ethnic groups (City Population, 2020). Along the line of volcanoes, it is a climatic zone that is covered with humid forests and with an altitude of up to about 4,100 m. It is divided into 6 administrative divisions (Fako, Koupe-Manengouba, Lebialem, Manyu, Meme, and Ndian), and 31 subdivisions.

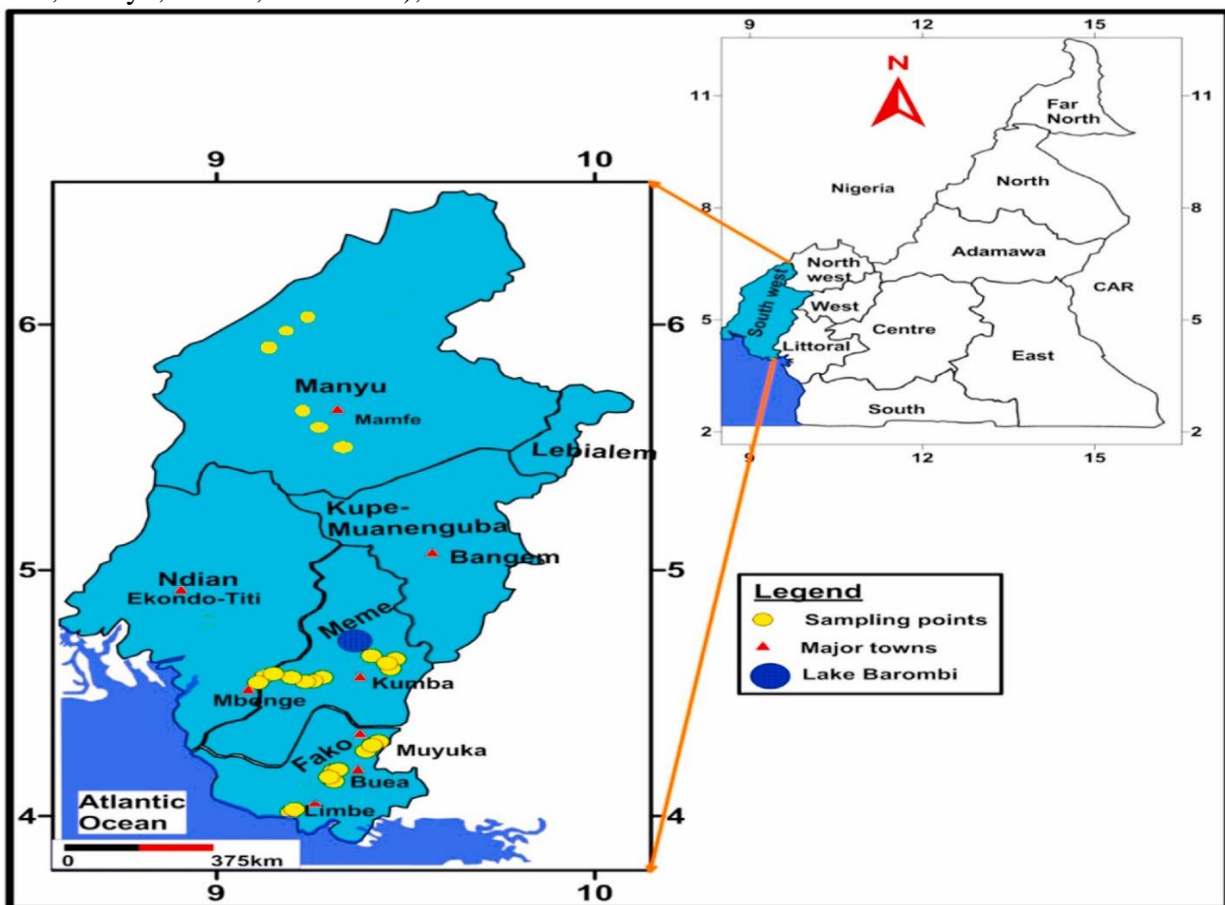


Fig. 1. The map of South West Region, Cameroon

Source: Resource Services of Agricultural Development, MINADER, 2015

The climate of the SWR is characterized by two main seasons; the dry season (November to March) and the rainy season (April to October) (DDARD, 2020). Annual rainfall averages vary from 2,000 to 3,000 mm depending on the location and are spread over an average of 156 days (MINADER, 2015). Humidity is rarely below 60% and at the height of humidity, it surpasses 80%. Average temperatures range between 23°C and 28°C (Bidault, 2000).

Agriculture is the main economic activity in the region. According to DDARD (2020), about 1,089,055 ha (that is, 42.8% of the total surface area) is under cultivation by over 61% of its inhabitants of which about 70% live in rural areas. In all, there are about 947,513 farmers in the region. The rich volcanic soil nature favors perennial crops like cocoa, palms, tea, coffee, citrus, and rubber, plus commonly grown food and vegetable crops like cassava, maize, yams, cocoyams, egusi, Irish potatoes, groundnuts, pepper, and plantains.

According to MINADER (2021), out of the total number of farmers in the SWR, about 79,893 are cocoa producers and constituting about 8.4% of the total number of farmers. According to the same report, a total of 138,080.1 tonnes are obtained from a cultivated surface of about 211,148.5 ha.

2.2 Sampling and data collection

The stratified multistage sampling technique was used to survey 380 cocoa producers. The first stage of the sampling was a purposive selection of the main cocoa-producing areas based on their percentage contribution. These areas were Meme (37.0%), Manyu (26.6%), Koupé-Manengouba (23.3%), and Fako (8.6%) (MINADER, 2021). The second stage equally involved a purposive selection of four subdivisions from each of the four divisions while taking their percentage contribution and accessibility into account. Finally, the third stage entailed the random selection of a hundred respondents from each area while taking into account the Cochran (1963) equation for large populations that is similar to the current study. With the aid of four research assistants, the household heads were approached at their homes, market, and farms, and through semi-structured questionnaires, the research questions were captured under 3 sections: socio-economic variables, drivers of financial inclusion, and constraints (barriers) to financial inclusion. In all, 380 questionnaires were valid for analysis.

2.3 Analytical framework

The study mainly seeks to explore the drivers of financial inclusion among cocoa producers in the Southwest region of Cameroon through primary data. First, descriptive statistics are applied to the socio-economic variables of respondents to further highlight drivers of financial inclusion. Secondly, the researchers employed the probit model to explore the drivers of financial inclusion considering the following independent variables; gender, age, marital status, household size, education level, primary occupation, training, experience, distance to the nearest formal financial institution, income and land size as further described in Table 1. Regarding the dependent variables of financial inclusion, the dummies of the three dimensions of financial inclusion (access, use, and quality) were captured in line with Asuming *et al.* (2019) and Fowowe (2020) (Table 1). Thus, the probit model as proposed by Martinez *et al.* (2013) and by extension Astuti *et al.* (2021) was used since the endogenous variables (financial inclusion dimensions) are dichotomous and explained based on probability. According to Gujarati (2012), the probit model is suitable because of its applicability to the cumulative distribution function that favors binomial data. Moreover, the study is confirmatory and the probit model seeks to confirm the various determinants of financial inclusion. Thirdly, the rank-ordered model was used to estimate the major constraints associated with financial inclusion.

2.4 Model Specification

Similar to Astuti *et al.* (2021), the probit model could be expressed as follows:

$$y_i^* = \beta_0 + \beta_i x_i' + \mu_i \dots\dots\dots (1)$$

$$\therefore y_i = 1 \text{ if } y_i^* > 0; y_i = 0 \text{ if } y_i^* \leq 0$$

Where: y_i represents the i^{th} farmer who is either formally financially included (1) or not (0); x' is the latent variable that determines whether included or not and it is explained by a host of independent variables (x_i) included in the vector (x'); β_i refers to the coefficients of the independent variables; β_0 is the intercept parameter; and μ , the random variable with a normal distribution of the mean, 0 and variance, 1.

Considering y_i as a threshold and y_i^* over y_i , then an individual is assumed to be financially included. The threshold y_i just as y_i^* , if taken to be normally distributed, the regression estimates and information on y_i could be obtained.

$$P_i = P(y_i = 1|x') = P(y_i \leq y_i^*) = P(Z_i \leq \beta_0 + \beta x_i') = F(\beta_0 + \beta x_i') \dots\dots\dots (2)$$

Where: $P(y_i = 1|x')$ refers to the probability of an event occurring at x which is a fixed value; Z is the standard normal variable, $Z \sim N(0, \sigma^2)$; and F is the cumulative normal distribution function (CDF). Mathematically, the probit model is expressed as follows:

$$F = \left(\frac{1}{\sqrt{2\pi}}\right) \int_{-\infty}^{y_i} e^{\frac{1}{2}(-z^2)} dz \dots\dots\dots (3)$$

$$F = \left(\frac{1}{\sqrt{2\pi}}\right) \int_{-\infty}^{\beta_0 + \beta x_i'} e^{\frac{1}{2}(-z^2)} dz \dots\dots\dots (4)$$

The probability of success is represented by P , and then the value between $-\infty$ and y_i is the standard normal value (equation 3), similar to the utility index for $\beta_0 + \beta_i$ (equation 4). By running the inverse of the CDF, the parameter estimates of the explanatory and unobserved variables can be obtained as follows:

$$Y_i = F^{-1}(y_i) = F^{-1}(P_i) \dots\dots\dots (5)$$

$$= \beta_0 + \beta_i x_i' \dots\dots\dots (6)$$

As specified in the implicit function (equation 1), the maximum likelihood estimation method (MLE) is applied as expanded in the model below:

$$P(\text{FinIcl}=1/X) = \beta_0 + \beta_1 Sx + \beta_2 Ag + \beta_3 As + \beta_4 Ms + \beta_5 Hs + \beta_6 El + \beta_7 Po + \beta_8 Ex + \beta_9 Dt + \beta_{10} R + \beta_{11} Ls + \mu_i \dots\dots\dots (7)$$

Where the dependent variable, $P(\text{FinIcl}=1/X)$ is the probability that a farmer will be financially included given the vector of the observable variables. Furthermore, the model was split into three different models (7a, 7b, and 7c) concerning the dimensions of financial inclusion. This was to determine the effect of inclusion drivers based on each correlate and then identify the variables that significantly affect all three correlates (financial inclusion). This is similar to the study of Fowowe (2020).

Model 1/ Access correlate:

$$P(\text{Act}=1/X) = \beta_0 + \beta_1 Sx + \beta_2 Ag + \beta_3 As + \beta_4 Ms + \beta_5 Hs + \beta_6 El + \beta_7 Po + \beta_8 Ex + \beta_9 Dt + \beta_{10} R + \beta_{11} Ls + \mu_i \dots\dots\dots (7a)$$

Model 2/ Use Correlate:

$$P(\text{Bor}=1/X) = \beta_0 + \beta_1 Sx + \beta_2 Ag + \beta_3 As + \beta_4 Ms + \beta_5 Hs + \beta_6 El + \beta_7 Po + \beta_8 Ex + \beta_9 Dt + \beta_{10} R + \beta_{11} Ls + \mu_i \dots\dots\dots (7b)$$

Model 3/ Quality Correlate:

$$P(\text{Sav}=1/X) = \beta_0 + \beta_1 Sx + \beta_2 Ag + \beta_3 As + \beta_4 Ms + \beta_5 Hs + \beta_6 El + \beta_7 Po + \beta_8 Ex + \beta_9 Dt + \beta_{10} R + \beta_{11} Ls + \mu_i \dots\dots\dots (7c)$$

The variables are further described in Table 1.

Table 1. Variables influencing the financial inclusion of farmers

Code	Variables	Description	Unit/ Nature
Dependent/ Outcome variable			
P(Act=1/X)	Access	Dummy: 1 = Owns an account; 0 = Otherwise	Dummy
P(Bor=1/X)	Usage	Dummy: 1 = Borrows money; 0 = Otherwise	
P(Sav=1/X)	Quality	Dummy: 1 = Saves money; 0 = Otherwise	
Independent variables			
Sx	Sex	Dummy: 1 = Male; 0 = Otherwise	Dummy
Ag	Age	Age of individual or household head	Years
As	Age square	Age of individual or household head squared	Years
Ms	Marital status	Dummy: 1 = Married; 0 = Otherwise	Dummy
Hs	Household size	Total number of household members	continuous
EI	Education level	Dummy: 1 = > Primary Education; 0 = Otherwise (if just primary or no formal education)	Dummy
Po	Primary occupation	Dummy: 1 = Full-time farmer; 0 = Otherwise	Dummy
Ex	Experience	Number of years involved in cocoa production	Years
Dt	Distance	Distance to the nearest formal financial institution	Km
R	Farm Revenue	Total amount generated from cocoa sales	FCFA
Ls	Land size	Total land size under cultivation	Ha

3. Results and discussion

3.1 Descriptive statistics on the drivers of financial inclusion

The findings of this study show that only about 28.9% of the farmers had access to formal financial services (FFSs) amongst which 16.6% utilized the services and 23.7% regarded the services to be of high quality (Figure 2). As such, access to FFSs is not enough to boost the level of financial inclusion but the use and quality of FFSs are equally important. Similarly, the World Bank (2018) suggested some ways to improve financial inclusion such as incorporating the use of credit cards to increase the number of transactions per account, increasing the number of bank branches, increasing the number of agents per customer, reducing cost in accessing financial products, high saving balances, and access to huge loans.

The majority of farmers that were interviewed were males (95.3%). The men dominated on all fronts regarding access to (28.4%), use (16.1%), and quality (23.2%) of FFSs unlike just 0.5% of women across all dimensions (Figure 2). Overall and proportionately, about 11.1% (of the 4.7%) of women involved in cocoa production were financially included as opposed to 16.9% of men, and a general inclusion rate of 16.6% for the region. The remaining 70.5% of the respondents relied on informal sources of credit and 12.9% were excluded from both formal and informal financial sectors. Similarly, Ndoua and Zogning (2022) revealed that men are more financially included in Cameroon than women by about 14%. Hunguana *et al.* (2020) showed that women are less favored and usually attached to a higher-level risk because of their informal economic activities and fewer skills. According to Ndoya and Tsala (2021), education is the major contributor to this gender gap in Cameroon. Thus, there is a need for financial literacy and more training among women.

As shown in Table 2, the findings revealed a productive age in the production sector (40.8 years on average) which favors cocoa production given that it is a strenuous activity. Also, up to 63.4% of the producers were married with an average household size of 5 members representing a larger workforce. Moreover, 80.0% of the respondents were involved in full-time farming which permitted them to properly monitor their farm operations. Also, cocoa producers had a mean farm experience of up to 16.5 years. Consequently, age, household size, and experience favored cocoa production in terms of higher yield and farm income which contributes positively to financial inclusion.

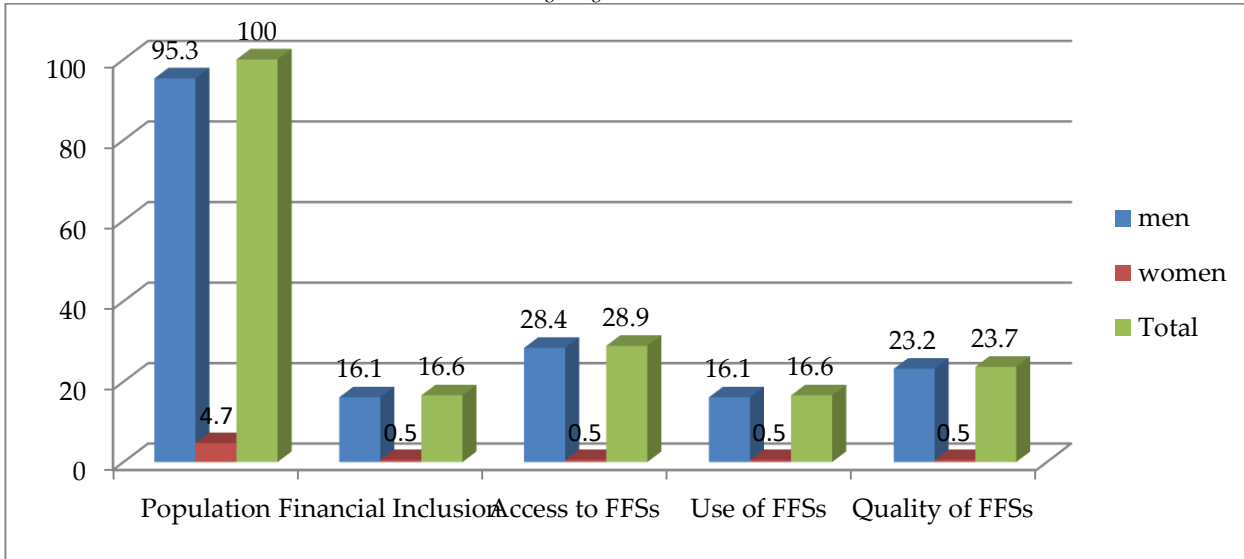


Figure 2. Percentage distribution of gender disparity across the dimensions of financial inclusion

Source: Author's computation from survey data, 2021

On the other hand, only about 27.4% of producers received formal education above the primary level and just 9.5% obtained farm training. Due to low levels of education and production knowledge, farmers' ability to produce more and realize more income is limited and a lack of basic knowledge and information on FFSs will further result in low financial inclusion. The socio-political crisis did not permit organizations like GIZ and ACEFA to access the area and carry out training besides that extension services were hindered and most schools were not operational. In addition, distance to formal financial institutions (FFIs) is one of the concerns regarding farmers' inclusion. The mean distance to the nearest FFI was revealed to be about 9.3 km considering that most of the cocoa producers are in the villages (remote areas) and coupled with the socio-political crisis that has pushed some FFIs to shut down and others relocated to major towns. Additionally, cocoa producers are intermediate owners with an average farm size of about 2.6 ha. This could be one of the reasons why farmers realized just about 1,125,863 FCFA as annual farm income from their sales of cocoa (Table 2) which further hinders financial inclusion.

Table 2. Descriptive Statistics of financial inclusion dimensions and its drivers

Variables	Mean	SD	Minimum	Maximum
Access to FFSs	0.2895	0.4541	0	1
Use of FFSs	0.1658	0.3724	0	1
Quality of FFSs	0.2368	0.4257	0	1
Male	0.9526	0.2127	0	1
Age (years)	40.8342	11.6257	18	67
Married	0.6342	0.4823	0	1
Household Size	5.0632	1.9223	2	13
Above Primary education	0.2737	0.4464	0	1
Full-time Farmer	0.8000	0.4005	0	1
Farm Training Received	0.0947	0.2932	0	1
Years of Experience (years)	16.4552	9.1551	3	40
Distance to the nearest FFI (km)	9.3216	5.8593	0.7	25
Farm Income (FCFA)	1,125,863	1,189,582	164,000	1.10e+07
Land size (ha)	2.5582	2.5565	0.5	18.5
Observation	380			

Source: Author's computation from survey data, 2021

3.2 Estimate of the drivers of financial inclusion

Results on the drivers of financial inclusion are presented on the three different dimensions of financial inclusion; access, use, and quality of FFSs as seen in Table 3. Respectively, the likelihood ratio of 225.6, 185.7, and 183.1 for access, use, and quality of FFSs was found to be significant at 1%. Thus, the respective pseudo R^2 of 0.49, 0.54, and 0.44 further revealed that the variables considered in the study (gender, age, age squared, marital status, household size, level of education, primary occupation, farm training, years of experience, distance to the nearest FFI, revenue, and land size) are considerable in the model (Table 3). Besides, the study identified 6 core drivers that significantly influence financial inclusion on account of all three dimensions of financial inclusion and should be considered in any policy aimed at enhancing financial inclusion in the area. These drivers were; an increase in income, farm training, the closeness of formal financial institutions (FFIs), larger household size, and small-scale production at a 1% significance level, and more years of farming experience at 5% as seen in Table 3.

Farm income generated from cocoa sales significantly contributed positively to the inclusion of farmers in the formal financial markets (FFMs). Therefore, an increase in farm income accounted for a greater likelihood of financial inclusion in the study area. According to several studies (Soumaré *et al.*, 2016; Zins & Weill, 2016; Abel *et al.*, 2018), income is one of the main drivers that positively enhances financial inclusion. So, access to inputs and proper agronomic practices can be achieved through subsidies and training in order to enhance the return (benefit) from production.

From the findings, farm training equally plays a key role in the inclusion of farmers in the financial market. Training received by farmers was positively correlated with financial inclusion and significant at 1% on all counts of financial inclusion dimensions. By implication, farm training can influence financial inclusion by about a 0.49 increase in access to FFSs, a 0.12 increase in the use of FFSs, and 0.38 higher quality in FFSs. Hence, training just like education has a significant contribution to the knowledge and application of farm and financial principles especially on access to finance (49%) as revealed. According to Le *et al.* (2019), higher literacy enables farmers to understand the pros and cons of financial services and enables them to use financial services wisely.

Also, an increase in the years of farming experience exhibited a significantly higher likelihood of farmers being included in FFMs than their fellow counterparts with lesser experience. Hence, experience just like knowledge in the mastery of farm operations enabled the farmers to be more productive. This in turn generated more farm income and with many years of farming, the farmers could realize the need for financial inclusion through which they were able to scale up their production by obtaining loans.

How close FFIs are to the farmers can influence financial inclusion. Results show that distance to FFIs is statistically significant at 1% and exhibits a negative relationship on all the dimensions of financial inclusion. The further the distance to the nearest FFI, the more farmers are excluded from FFSs. That is, marginally, a unit increase in the distance to FFIs resulted in a higher probability of 0.03 lesser access to FFSs, 0.008 lesser use of FFSs, and 0.02 lower quality of FFSs as compared to if the FFIs were closer. This is in line with the study of Akudugu (2013) who revealed a significant contribution of FFI distance on financial inclusion. Thus, there is a need for more FFIs to be established and brought closer to the farmers. Also, all the FFIs that have not been operational due to the socio-political crisis can be revived by the government and necessary stakeholders by advocating for peace and justice. As a result, many people will be included in the financial mainstream.

The land size was another driver that exhibited a negative relationship with financial inclusion and was statistically significant at 1% for the three dimensions of financial inclusion. When land size increases, there is a greater likelihood of financial exclusion. Marginally, if land size increases by a unit, there is a greater probability that access to FFSs will fall by a likelihood of 0.16 units, use of FFSs will drop by 0.04 units, and quality by 0.10 units. The reason was that farmers were unable to properly manage larger farms and it resulted in low yields/ farm income which intend hinders financial inclusion. As such, larger farms do not necessarily imply higher yields. Thus, producers must be thought proper ways of farm

diversification and the incorporation of mechanization in the management of such large farms. As seen, small-scale production greatly influences access (16%) positively when compared to the use (4%) and quality (10%) of FFSs.

Table 3. Estimates of the drivers of financial inclusion across three dimensions

Variables	Access Correlates		Use Correlates		Quality Correlates	
	Coefficients (Std errors)	Marginal effects	Coefficients (Std errors)	Marginal effects	Coefficients (Std errors)	Marginal effects
Male	0.0793 (0.5863)	0.0190 (0.1351)	-1.2440* (0.6659)	-0.2107 (0.1927)	-0.3492 (0.5732)	-0.0844 (0.1605)
Age (years)	0.1870** (0.0767)	0.0463** (0.0187)	0.0344 (0.1011)	0.0022 (0.0065)	0.1449* (0.0799)	0.0295* (0.0159)
Age Squared (years)	-0.0030*** 0.0009	-0.0007*** (0.0002)	-0.0014 (0.0012)	-0.0001 (0.0001)	-0.0025** (0.0010)	-0.0005*** (0.0002)
Married	0.2251 0.2493	0.0542 (0.0584)	0.5030* (0.3007)	0.0295 (0.0193)	0.3452 (0.2477)	0.0667 (0.0460)
Household Size	0.2135*** (0.0625)	0.0529*** (0.0153)	0.2408*** (0.0730)	0.0156*** (0.0061)	0.1408** (0.0560)	0.0287*** (0.0111)
Above Primary education	0.6991*** (0.2262)	0.1983*** (0.0734)	0.3731 (0.2589)	0.0287 (0.0252)	0.2769 (0.2211)	0.0606 (0.0524)
Full-time Farmer	-0.0869 (0.2303)	-0.0221 (0.0600)	-0.3135 (0.2589)	-0.0244 (0.0255)	-0.2853 (0.2203)	-0.0640 (0.0543)
Farm Training Received	1.4289*** (0.3000)	0.4915*** (0.1069)	0.8673*** (0.3272)	0.1078* (0.0622)	1.2166*** (0.2866)	0.3757*** (0.1056)
Years of Experience	0.0410** (0.0181)	0.0102** (0.0045)	0.0604*** (0.0228)	0.0039** (0.0018)	0.0415** (0.0178)	0.0085** (0.0037)
Distance to the nearest FFI (km)	-0.1207*** (0.0206)	-0.0299*** (0.0047)	-0.1174*** (0.0290)	-0.0076*** (0.0026)	-0.0958*** (0.0202)	-0.0195*** (0.0039)
Farm Income (FCFA)	1.93e-06*** (3.95e-07)	4.79e-07*** (0.0000)	2.48e-06*** (4.68e-07)	1.61e-07*** (0.0000)	1.73e-06*** (3.85e-07)	3.53e-07*** (0.0000)
Land size (ha)	-0.6321*** (0.1661)	-0.1567*** (0.0435)	-0.6670*** (0.1827)	-0.0433** (0.0190)	-0.4922*** (0.1608)	-0.1003*** (0.0349)
Constant	-4.9181*** (1.7082)		-1.9744 (2.2679)		-3.6626** (1.7728)	
Pseudo R ²	0.49		0.54		0.44	
Prob > chi ²	0.0000		0.0000		0.0000	
LR chi ² (12)	225.55		185.72		183.11	
N	380		380		380	

Note: ***, **, * = Significant at 1%, 5%, 10%. Values in parenthesis are the standard values

Source: Author's computation from survey data, 2021

Results also showed that a larger household (HH) size had a significantly higher likelihood of 0.21 access to FFSs, 0.24 use, and 0.14 quality of FFSs. Soumaré *et al.* (2016) also indicated that a larger HH size contributes significantly to financial inclusion. More members in a household can augment labor and maximize farm income. The excessive wage paid to hired labor is minimized. As such, more income is obtained which promotes financial inclusion.

The results further showed that age and education were significant positive drivers of access to FFSs as expected. For all three dimensions of financial inclusion, age was directly proportional but the age squared was inversely proportional to financial inclusion. This is consistent with the study of Peña *et al.* (2014) and Abel *et al.* (2018) where financial inclusion increases with age up to a particular age and then begins to fall due to the negative quadratic nature. In terms of education, the coefficient on all dimensions was positive indicating that the higher the level of education, the higher the level of inclusion. Peña *et al.*

(2014) and Abel *et al.* (2018) also supported that knowledge of the FFM and its services influences financial inclusion and access to FFSs in particular.

The results also depicted that males have more access to FFSs. This is an indication that males have more access to FFSs by a 0.08 higher likelihood than their female counterparts. Thus, marginally, for every man who adds, there is a probability of 0.02 more access to credit as confirmed in a study by Akudugu (2013) that men are more likely to be included in the financial market than women. On the other hand, the coefficient of males for the use and quality correlates was negative. This implied that the more the number of males, the lesser the use and quality of FFSs. Hence, other than just access to FFSs, women were found to make more use of these services than men and as such, should be motivated and included in the FFMs through access. Women exhibited an inverse relationship with access to FFIs due to a lack of collateral because land tenure systems in the area do not favor women. Thus, land acquisition and ownership should be made liberal for the farmers, especially women.

3.3 Constraints encountered by farmers about financial inclusion

The study found that the lack of collateral security is a major challenge to farmers' financial inclusion (Table 4), similar to the study by Shillie *et al.* (2022). Another challenge identified by this study was the distance to FFIs that were further away from the farmers (9.3 km) making it difficult for farmers to fully integrate themselves into the FFIs. Some of the few institutions that were closer to the farmers were relocated to the major towns due to the insurgence of the socio-political crisis in the area. Moreover, the low-income status of the farmers restricted them from covering the cost of account creation, and the inability to save. As a result, it was challenging for farmers to be granted loans. In all, the lack of collateral security, distant institutions, and low income accounted for up to 51.3% of the constraints that retarded the level of financial inclusion in the region. Thus, these three variables must also be taken into account for any policy design to increase the level of inclusion.

Table 4. Financial inclusion constraints faced by farmers

Constraint	Observation				Ratio	Rank
	Actual Problem		Not an Actual Problem			
	Frequency	Percentage	Frequency	Percentage		
Lack of collateral security	287	25.2	853	74.8	1 : 3.0	1 st
Distant institutions	152	13.3	988	86.7	1 : 6.5	2 nd
Low income	146	12.8	994	87.2	1 : 6.8	3 rd
Financial illiteracy	145	12.7	995	87.3	1 : 6.9	4 th
Lack of trust/skeptical	124	10.9	1,016	89.1	1 : 9.0	5 th
Bureaucracy	116	10.2	1,024	89.8	1 : 8.8	6 th
Lack of information	49	4.3	1,091	95.7	1 : 22.3	7 th
Too expensive	38	3.3	1,102	96.7	1 : 29.3	8 th
Inadequate FFIs	34	3.0	1,106	97.0	1 : 32.3	9 th
Low education level	27	2.4	1,113	97.6	1 : 40.7	10 th
Inadequate loans	15	1.3	1,125	98.7	1 : 75.9	11 th
Belief system	7	0.6	1,133	99.4	1 : 165.7	12 th

Source: Author's computation from survey data, 2021

4. Conclusion and recommendations

Financial inclusion is a vital mechanism for the enhancement of cocoa production and productivity in the SWR of Cameroon. However, due to the low level of financial inclusion with a consequent negative effect on the cocoa production level, this study aimed at determining the drivers of financial inclusion across its three different dimensions. As a result, six significant drivers at $\leq 5\%$ level of significance were identified as enhancers of financial inclusion: increase in income, farm training, more years of farming experience, the proximity of formal financial institutions, larger household size, and small-scale cocoa production. By implication, distant formal financial institutions limit the level of financial inclusion. An average distance

of up to 9.3 km to the nearest FFIs due to the closure/ relocation of some financial institutions has contributed to financial exclusion. Moreover, low income hinders access to FFIs in terms of cost of account creation and savings. In addition, lack of farm training, fewer years of farm experience, and intermediate farmland sizes only further exacerbate low farm yields/ income and consequently financial exclusion. Also, lack of collateral security, distant institutions, and low income was identified as the main constraints to financial inclusion and accounted for up to 51.3% of the constraints that retarded financial inclusion in the region. Collateral security is one of the major requirements of financial institutions in accessing loans. Thus, lack of collateral due to intermediate farm sizes and producers operating mostly sharecrop leasing further hampers financial inclusion. Consequently, cocoa producers are unable to obtain loans that will enable them to invest in their farms and seek possible expansion/ diversification.

Policy issues to increase the level of financial inclusion should include the following. First, more FFIs must be established. This is achievable through government intervention to ensure that the remote areas most especially have access to constant electricity and stable network systems, and a guaranteed sustainable solution to the crisis plaguing the region. Also, there is a need for financial literacy through which the farmers will be educated on the various needs and services of the FFIs and how they can belong to these institutions. Equally, more practical-based farm training should be organized with proper follow-up by extension agents to ensure sound agronomic practices by the farmers. This will enable the farmers to efficiently produce their cocoa, minimize cost, and guarantee high cocoa bean quality. Consequently, the producers will obtain a higher income that will intend to enhance their capacity to be included in the FFIs. In addition, it is important that the government revisits its land tenure system and make it less procedural for women and youths inclusive. This will not only boost production but also serve as a source of collateral that will further enhance financial inclusion.

5. Limitations and direction for further study

The study laid more emphasis on the demand side of financial inclusion. Also, only one crop type (cocoa) was considered in the study. Thus, there is a need for further research that takes into consideration both the demand and supply side of financial inclusion as well as a consideration for farmers of the different types of crops cultivated (cereals, legumes, vegetables, fruits, staples, etc.). As such, these would further reveal definite drivers of financial inclusion.

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