



Factors influencing willingness and participation in cocoa certification programs among farmers in Sierra Leone

Factores que influyen en la voluntad y la participación en los programas de certificación del cacao entre los agricultores en Sierra Leona

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ABSTRACT: This paper examined the determinants of willingness and actual participation in Cocoa certification programs in Sierra Leone, exploring the perspectives of farmers and certification officers. A multistage sampling technique was used to select Kailahun district as the most predominant in cocoa production, the Kissi Tongi Chiefdom due to high concentration of cocoa farmers and certification officers, and 10 cocoa producing communities from each where 20 cocoa farmers were random selected to give a total sample size of 200 farmers; while 30 certification officers were also randomly selected in the study area. Data were collected farmers and certification officers using a structured questionnaire subjected to face validity and covering the socio-economic characteristics, participation, and constraints to participation. The data collected were coded and analyzed with the Statistical Package for Social Sciences (SPSS) Version 29, using frequency counts, percentages, Probit and multiple linear regression. The results show that the determinants of willingness to participate are ethnicity ($t = -3.01, p < 0.003$); marital status ($t = 1.81, p < 0.07$); religion ($t = 3.13, p < 0.002$) and income ($t = -6.26, p < 0.00$) while the determinants of actual participation are constraints on extension services ($t = 1.86, p < 0.06$); educational level ($t = 3.69, p < 0.00$) and participation in extension services ($t = 1.96, p < 0.05$). These results imply that critical socio-cultural factors influence willingness to participation, while technical factors determine actual participation. The combinations of socio-cultural and technical factors would enhance farmer's participation in agricultural programs and enhance adoption.

Key words: willingness to participate, cocoa farmers, certification.

RESUMEN: Este artículo examina los factores que influyen en la voluntad y la participación real en los programas de certificación del cacao entre agricultores en Sierra Leona. Se aplicó una encuesta transversal con diseño descriptivo a toda la población de 20000 familias productoras de cacao en el área de estudio, según el listado obtenido de la oficina agrícola. Se utilizó una técnica de muestreo por etapas para seleccionar un distrito, 15 jefaturas y 11 comunidades, de las cuales se eligieron aleatoriamente 200 agricultores de cacao como muestra. Se empleó un cuestionario estructurado para recopilar datos sobre características socioeconómicas, percepción sobre la participación en el programa de certificación y limitaciones para participar en dicho programa. El análisis de datos se realizó mediante el paquete estadístico SPSS versión 29, utilizando frecuencias, porcentajes, regresión Probit y regresión lineal múltiple. Los resultados muestran que la mayoría de los agricultores de cacao tienen menos de 40 años, son hombres, pertenecen al grupo étnico Mende, están casados, son cristianos, no tienen educación formal, poseen fincas menores de 4 hectáreas, viven en hogares con menos de 7 personas, tienen menos de 25 años de experiencia agrícola y ganan menos de 10000 Leones por temporada. La mayoría tiene una percepción positiva del programa de certificación, pero enfrentan restricciones muy severas para participar. Los factores significativos que determinan la voluntad de participar en la certificación del cacao son la etnia ($p < 0,05$), el estado civil ($p < 0,10$), la religión ($p < 0,001$), los ingresos ($p < 0,001$) y la participación en servicios de extensión ($p < 0,001$); mientras que los factores significativos que determinan la participación real son el nivel educativo ($p < 0,001$), la participación en servicios de extensión ($p < 0,10$), las limitaciones en los servicios de extensión ($p < 0,10$) y el impacto de dichas limitaciones ($p < 0,001$). Los resultados implican que los factores que influyen en la voluntad de participar son distintos de aquellos que determinan la participación efectiva en los programas de certificación.

Palabras clave: voluntad de participar, agricultores de cacao, certificación.

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INTRODUCTION

Cocoa is a leading agricultural export and a major source of foreign exchange and rural employment in Sierra Leone. It is vital to the economy, particularly outside the mining sector, and is the main source of livelihood for many rural inhabitants in regions like Eastern Sierra Leone. Cocoa is one of the main cash crops in Sierra Leone. The country produces dried cocoa beans between 14000 and 20000 metric tons per year, with an average yield of 410 kg ha. In 2017, the country was ranked 17th for both production and area harvested among all cocoa-producing countries because of its poor management practices (1). The World Bank Trade Statistics in 2017 records Sierra Leone's cocoa export earnings of US\$ 14461 million (2) despite the low yield as compared to other West African countries. As a major cash crop, cocoa farming is the main source of livelihood of rural inhabitants of Eastern Sierra Leone. Cocoa bean is predominantly produced in the Eastern region of Sierra Leone of which Kailahun, Kenema, Kono, and Bo districts accounts for about 114125, 58086, 43232, and 11715 hectares respectively (3); however, despite increasing hectares, cocoa yield in Sierra Leone has been varying on average, between 300 kg ha to 400 kg ha for the past two decades (3). However, the sector faces challenges such as low productivity, ageing plantations, and limited access to credit, which prevent it from reaching its full potential in the post-civil war period despite Sierra Leone being one of the major players in the global cocoa market; as cocoa contribute to the country's development and poverty alleviation strategies for many years. Africa's exports including Sierra Leone are concentrated in unprocessed and under trading cocoa and thus have substantial potential to trade more both in volume and in terms of product variety and sophistication (4). Approximately 40 % of cocoa farmers live below the poverty line (5), a global trend is mirrored in Sierra Leone (6). Farmers and traders incur high transaction costs in the transportation of cocoa from farms to aggregation centers and to final export processing warehouses in Freetown (7).

A major current challenge for the global cocoa sector is the availability of sufficient quality beans to feed a global demand that is estimated at 4.25 million MT per year and growing due to surging demand for chocolates and other cocoa derivatives (7).

A major program applied to address the decline production and the profitability of the cocoa sector is the cocoa certification. Sustainability concerns in global food systems have prompted a proliferation of sustainability standards as a non-state, market-based governance instrument to address environmental, social, and economic issues in agri-food value chains (8). Over 20 % of the global cocoa area is certified (9), but consumer demand and willingness to pay for sustainably produced food products are growing, with countries in the European Union and North America being the most important markets for certified cocoa (10). A key strategy of chocolate manufacturers is the promotion of sustainable farming practices amongst their supplying cocoa producers (7). A wide range of organizations, including national research institutions and non-governmental organizations (NGOs), have over the years assisted cocoa cultivation

by providing them with essentials services such as credit, extension advice, disease control programs, among others (11). Certification is a typology of sustainability certification which has been depicted as a critical tool for addressing environmental and socioeconomic challenges associated with commodity crop production, processing, and trade; although sustainability standards alone are not enough to usher in sustainability at scale (12).

The adoption of certification is often associated with premium price payments to participating producers as incentives for adopting sustainable production practices, improving livelihood/welfare of smallholders, and promoting further environmental sustainability efforts. However, reports are mixed on the impacts on participating farmers' well-being and its ability to ensure food systems sustainability at scale and/or address equity issues in the production process. Third-party certification is generally recognized as a multi-stakeholder initiative promoted by partnerships involving relevant national governments, international development organizations, NGOs, the private sector, and representatives of producers and consumers. These findings suggest that while the effectiveness of certification can vary by context and implementation, well-designed and supported certification programs have the potential to deliver tangible benefits to producers and contribute to broader development goals.

However, the effectiveness of certification in delivering improved sustainability outcomes in the agri-food sector remains challenged. Some studies report considerable sustainability gains from certification, in relation to reduced poverty (19), health benefits (20), or improved nutrition and gender equity (21). Certification has no effects on income in Peru (22), UTZ certification reduces coffee yield and income in Nicaragua (23), poor producers are marginalized and face entry barriers due to high investment and certification costs, as well as knowledge and labour constraints (24), undermine local and culturally-defined food systems by prioritizing global market demands, encouraging specialization in export commodities and monocultures, and thereby restricting food sovereignty (25). Some authors (13, 26) noted that the impacts of certification are highly context-dependent and shaped by institutional and economic factors. Certification is increasingly buyer-driven, and downstream supply chain actors, such as traders or processing companies, often take the role of operators of smallholder group certificates and the organization of the farm-level training, audits, and premium payments (27).

The literature is filled with studies on the factors that determine participation in agricultural programmes, in which many of these studies examined a broad range of factors such as gender, education, farm size, extension contact, household size, farm experience, age, distance and credit. Cocoa farmer's participation in the spraying programme was high among male cocoa farmers, with high farming experience, frequent extension contacts, and having small household size (28). Farmers' knowledge, perceived ease of use, education level, prior experience, and family size emerged as critical factors driving the adoption of fermentation technology in Indonesia (29).

The significant determinants of cocoa farmer's participation in Innovation Platform in order of magnitude are psychological factor, experience factor, community related factor, educational factor, economic factor and internal factor (30). The factors such as the age of smallholders, gender, training, farming experience, education, and attitude influence the smallholder's participation in the agricultural certification scheme (18). Farmers' access to training; advisory service through the value chain organization, persistence; and farmers' dependency on this value chain explained the implementation of sustainable farming practices among farmers in Ecuador and Uganda (31). Cocoa farmers' willingness to pay for cost-effective extension services in Ghana are perceived service quality, rainfall and temperature variability, climate change impact, age, education, access to credit, and farm income (32).

The factors influencing participation cocoa certification and traceability program are education level, membership in farmer-based organizations, age of the farm, and frequency of extension services (33). Among corporate-driven cocoa certification schemes a large difference in farm-level interventions across certification schemes and positive effects on farm production and producer income in those schemes with the strongest interventions were found (34), with the complementarity of control, market-based incentives, and capacity-building interventions in delivering beneficial farm-level effects. Factors influencing cocoa farmers' willingness and participation in certification programs are a mix of socio-economic factors, institutional factors, and perceptual factors. Higher education, better access to information, and positive attitudes toward the benefits of certification are often associated with greater participation, while limited extension services and a lack of awareness can be major barriers.

As part of the Dutch government-funded Cocoa Rehabilitation and Intensification Program, which aims to increase the country's sustainable cocoa output, Solidaridad established the Farmer Support Centre in 2018. The program provides a variety of services to 12000 cocoa farmers in Sierra Leone, using the support centres as a central location to increase their output, earnings, and standard

of living. Agrochemicals, fertiliser, crop protection, better planting materials, and financial services are all available at the Farmer Support Centres, which are one-stop shops. They were founded as a private sector-led organisation to provide smallholder cocoa growers with production and marketing services. In Sierra Leone, information on the socio-economic determinants of participation in the cocoa certification program is very limited despite the importance of cocoa to the economy. It is in this light that we sought to bridge the knowledge gap by providing empirical evidence of the factors influencing farmers' willingness and participation in the certification program. The main objective of this study is to explore the Factors influencing willingness and participation in cocoa certification programs among farmers in Sierra Leone.

MATERIALS AND METHODS

The Eastern Province of Sierra Leone, located in the far east of the country, northeast of Kenema, and close to the Liberian border, is where the study was conducted. The terrain and vegetation range from low and inland valley wetlands to hills and plateaus, a landform that support plantation farming and with high rainfall pattern. Figure 1 shows the map of the study area with Sierra Leone.

A cross-sectional survey based on descriptive design was applied, with all 20000 cocoa farm families in the study area as the population of study (35), based on the list obtained from the agricultural office. A multistage sampling technique was used, to select a district, 15 chiefdoms, and 11 communities, from which 200 cocoa farmers were randomly selected as the sample size. A structured questionnaire was used to collect data on socio-economic characteristics, perception of participation in certification program and constraints to participation in certification program. The perception was measured on a 3-point Likert scale of Agree (3), Undecided (2) and Disagree (1), while constraints was operationalized as very severe (3), severe (2) and not severe (1). Willingness to participate in certification program was operationalized as a dichotomous variable (willingness = 1 and 0 if otherwise); while participation was a pooled scores with a maximum and minimum score of (75 maximum and 25 minimum).

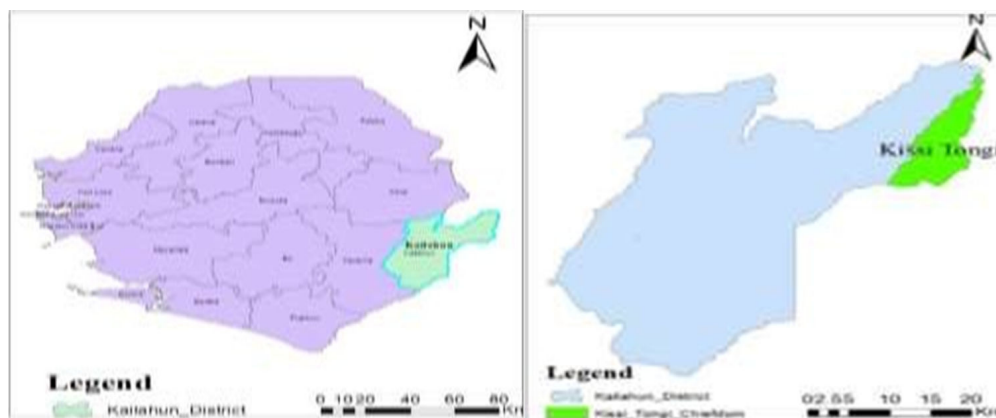


Figure 1. Map of Sierra Leone showing the study area

The lecturers from School of Agriculture and Food Sciences as well as Licensed Cocoa buyers face-validated the questionnaire. Data analysis was conducted with the Statistical Package for Social Sciences (SPSS) Version 29, using frequency counts, percentages, Probit regression and multiple linear regression. The research committee of the School of Agriculture and Food Sciences granted ethical clearance for the study. The Probit regression equation was expressed as: $Pr Y_i = 1 = \Phi(X_i \beta_i + u_i)$, Where, Pr denotes the probability of willingness to participate, $\Phi(.)$ is standard normal Cumulative Distribution Function, X_i is a vector of regressors with $n \times k$ matrices, β_i is $k \times 1$ vector of unknown parameters to be estimated to be estimated, u_i is $n \times 1$ residual error, and unknown β_i parameters are estimated via Maximum Likelihood. The Multiple linear regression was expressed as the OLS model: $Y = F(X_1, X_2, X_3, X_4, \dots, X_{13})$. The explicit form is stated as: $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + et$. Table 1 shows the description of variables covered in the study.

RESULTS AND DISCUSSION

Table 1 shows results of the demographic characteristics of farmers and other related variables on willingness and participation in cocoa certification program.

Table 2 presents the results on perception towards certification by farmers. The majority of the cocoa farmers have positive perception of the certification program. Many of the perception statements recorded high percentages on the agree category.

In Table 3 the findings on the constraints faced by farmers in participation in certification programs are presented. The majority of farmers indicated that they experience very severe

constraints in participating in cocoa certification program as many of the listed constraints recorded high percentages in the 'very severe' category.

Table 4 reveals that significant variables for willingness are quite different for the significant variables for participation, which constitute the results of the determinants of willingness and participation in certification programs by cocoa farmers

In Table 1, majority of cocoa farmers are less than 40 years, males, Mende, married, Christians, without formal education, having farm size less than 4 hectares, household size less than 7 persons, having farming experience less than 25 years, and earn less than 10000 Leones per season. The trend of these results may be attributed to the drive by government and NGO on the Cocoa Rehabilitation and Intensification Program where many job opportunities are linked to the cocoa value chain. Similar findings were reported among cocoa farmers in Ghana (36, 37). Cocoa farmers in Ghana have an average age greater than 50 years (38), while affirm that religious affiliation influence participation in cocoa certification program (39). Similarly, the source of income is mainly from cocoa farming, radio as main source of information, having high and positive perception scores, extension impact scores, technology impact scores, and experiencing very severe constraints in participation in certification program. Cocoa farmers in Ghana have no formal education, with 15 years of cocoa farming, having less than 5 persons per household, relied on extension officer and radio as sources of information and high frequency of contact with extension services (36, 37). License Buyer Agents (LBAs) and exporters are critical information sources in Nigeria (40). The findings further indicate that majority of the cocoa farmers are willing to participate in certification program, as the selected farmers for this study encompasses all producers, not just those engaged in certification.

Table 1. Descriptions of independent variables

Variables	Description	Expected sign	Remarks
Age	Age in years	+	Majority less than 40 years
Ethnicity	Dummy =1 if Mende, 0 female	+/-	Majority Mende
Marital Status	Dummy =1 if married, 0 otherwise	+/-	Majority married
Religion	Dummy =1 if Christian, 0 otherwise	+/-	Majority Christians
Educational level	Dummy =1 formal education, 0 otherwise	+/-	Majority without formal education
Cocoa farm size (hectares)	Farm size in hectares	+/-	Mainly less than 4 hectares
Number of Dependents	Number of persons	+/-	Mainly less than 7 persons
Farming Experience	Number of years	+	Mainly less than 25 years
Income (Leones)	Amount in Leones	+/-	Mainly less than 10000 Leones
Income sources	Dummy =1 cocoa farming, 0 otherwise	+/-	Mainly cocoa farming
Information sources	Dummy =1 extension officer, 0 otherwise	+/-	Mainly radio
Gender	Dummy =1 if male, 0 female	+/-	Mainly males
Willingness to participate in certification	Dummy =1 if yes, 0 otherwise	+/-	Majority are willing to participate
Perception of certification	Participation score	+	Mainly high perception scores
Constraint of extension services	Extension Constraints scores	+	Mainly very severe scores
Impact of extension constraint	Impact scores	+	Mainly extension impact scores
Impact of technology Constraint	Technology impact scores	+	Mainly technology impact scores
Constraint of certification	Certification constraints scores	+	Mainly high certification constraints scores

Source: Field data, 2024

Table 2. Farmers' perception of participation in certification program

Perception statements	Agree	Undecided	Disagree
Improves sustainable farming methods	191 (95.5)	7 (3.5)	2 (1)
Provides young people with sources of employment	163 (81.5)	25 (12.5)	12 (6)
Guarantees the effectiveness of cocoa seed quality	189 (94.5)	10 (5)	1 (0.5)
Guarantees the control of cocoa produce prices	179 (89.5)	18 (9)	3 (1.5)
Encourages agricultural diversity, innovation, and organic farming.	154 (77)	33 (16.5)	13 (6.5)
Boosts credibility and reputation	137 (68.5)	50 (25)	13 (6.5)
Participation in certification programs opens up new markets	178 (89)	12 (6)	10 (5)
Programs for certification raise the price of produce on the market	185 (92.5)	14 (7)	1 (0.5)
Cocoa certification increases financing availability and encourages self-reliance	151 (75.5)	36 (18)	13 (6.5)
Participation in cocoa certification promotes agroforestry methods	123 (61.5)	55 (27.5)	22 (11)
Engagement enhances marketing and brand recognition	175 (87.5)	20 (10)	5 (2.5)
Programs for certification aid in lowering contamination hazards	197 (98.5)	3 (1.5)	0 (0)
Long-term environmentally friendly farming methods are encouraged by certification	152 (76)	34 (17)	14 (7)
Certification encourages resilience and climate-smart activities	190 (95)	6 (3)	4 (2)
Taking part in certification improves produce traceability	168 (84)	26 (13)	6 (3)
Ensures that individual farmers receive both minimum and premium prices	144 (72)	37 (18.5)	11 (5.5)
Certification guarantees labour standards monitoring and interventions	157 (78.5)	26 (13)	17 (8.5)
Through roles, certification guarantees gender equality and equity	178 (89)	19(9.5)	3(1.5)
Taking part in certification increases profits	167 (83.5)	23 (11.5)	10 (5)
Accountability and openness are made possible via certification	167 (83.5)	27 (13.5)	6 (3)

Source: Field data, 2024

Table 3. Constraints faced by farmers in participation in certification programs

Constraints to Participation in cocoa certification program	Very Severe	Severe	Not severe
Certification costs for farmers and their cooperatives are very expensive.	93 (46.5)	68 (34)	39 (19.5)
Market entrance restrictions and insufficient staffing in cocoa certification programs	113 (56.5)	86 (43)	1 (0.5)
Absence of technology and equipment required for certification	102 (51)	82 (41)	16 (8)
Insufficient guidance or assistance for farmers and cooperatives seeking certification	73 (36.5)	111 (55.5)	16 (8)
Issues with logistics or transportation restrict the certification process.	115 (57.5)	80 (40)	5 (2.5)
Maintaining records for certification is challenging.	78 (39)	121 (60.5)	1 (0.5)
Having trouble getting technical support for certification	92 (46)	94 (47)	14 (7)
Limitations in language	158 (79)	41 (20.5)	1 (0.5)
Administrative obstacles and bureaucracy restrict certification.	63 (31.5)	126 (63)	11 (5.5)
Lengthy certification procedure	124 (62)	55 (27.5)	20 (10)
Certification offers few advantages to small-scale cocoa growers.	144 (72)	30 (15)	26 (13)
Lack of knowledge or comprehension of small-scale farming	128 (64)	71 (35.5)	1 (0.5)
Complex specifications, EU laws, rules, and guidelines	114 (57)	63 (31.5)	23 (11.5)
Certification is limited by low output.	93 (46.5)	56 (28)	51 (25.5)
Programs for cocoa certification demand extra work.	145 (72.5)	54 (27)	1 (0.5)
Certification programs are limited by a lack of enthusiasm from farmers.	143 (71.5)	46 (23)	11 (5.5)
Cocoa certification programs face challenges with compatibility and diversity.	127 (63.5)	52 (26)	21 (10.5)
The accessibility and availability of certification organisations	134 (67)	45 (22.5)	21 (10.5)
The accreditation has problems with openness and accountability.	151 (75.5)	48 (24)	1 (0.5)
Lack of farmers' interest limits certification programmes	81 (40.5)	95 (47.5)	24 (12)
Maintaining an organic farm is challenging because of new regulatory requirements.	89 (44.5)	85 (42.5)	26 (13)

Source: Field data, 2024

Table 4. Determinants of willingness and participation in certification programmes by cocoa farmers

Independent variables	Probit function on willingness	OLS function on actual participation
	Estimate (SE)	B (SE)
Age	.0022 (.0021)	-.006 (.034)
Ethnicity	-.160(.0531) **	.143 (1.295)
Marital Status	.0411(.0222) *	.145 (.111)
Religion	-.130(.039) ***	.155 (.121)
educational level	.001(.0085)	.758 (.205) ***
cocoa farm size (hectares)	.0065(.0088)	-.202 (.186)
Number of Dependents	-.005(.004)	.135 (.101)
Farming Experience	.001(.002)	.007 (.056)
Income (Leones)	.001(.001) ***	2.662 (.000)
income sources	-.025(.024)	.029(.018)
Information sources	.029(.018)	.095 (.367)
Gender	-.019(.031)	.058 (.708)
Participation in extension services	.004(.004) ***	.134 (.069) *
Constraint of extension services	.065(.045)	.137 (.074) *
Impact of extension constraint	-.079(.006)	.007(.007) ***
Impact of technology Constraint	-.035(.059)	-.083 (.134)
Constraint of certification	.001(.045)	-.073 (.104)
Intercept/ Constant	-1.013(.312) ***	85.496 (9.075) ***
Chi-Square/ F	111.87	1.96
Df	183	198
Sig.	.000	.033
R	NA	.352
R Square	NA	.120
Adjusted R Square	NA	.044

Source: Field data. 2024

Gender, age, education level, and preferred methods of receiving information influence farmers' willingness to participate in certification program⁴¹.

From Table 2, the prominent perception statements on certification program recorded above 70 percent under the agree category with statements on certification aid in lowering contamination hazards (98.5 %), Improves sustainable farming methods (95.5 %), encourages resilience and climate-smart activities (95 %) and guarantees the effectiveness of cocoa seed quality 994.5 %) as the most prominent. This may be because these are the immediate benefits of the certification program. Certification benefits both farmers and the broader cocoa industry by enhancing environmental sustainability and reduced use of pesticides^(42, 43). Conversely most cocoa farmers disagree with statements on certification promotes agroforestry methods and Certification guarantees labour standards monitoring and interventions. Farm workers' wages do not seem to benefit from the presence of certification and, that without certification cocoa plantation still maintain crucial agroforestry practices (44).

In Table 3, the prominent constraints on certification program recorded above 70 percent under the very severe category with statements on limitations in language (79 %), certification offers few advantages to small-scale cocoa growers (72 %), certification programs are limited by a lack of enthusiasm from farmers (71.5 %), and accreditation

has problems with openness and accountability (75.5 %). However, most cocoa farmers indicated not severe with constraints on Certification costs for farmers and their cooperatives are very expensive (19.5 %) and Certification is limited by low output (25.5 %). Certification might raise market prices, small-scale however, farmers are typically discouraged from participating since the upfront costs are greater than the benefits (43). Farmers find it challenging to navigate the system due to complicated certification processes, which causes delays and discontent (45), while some authors indicated that smallholder farmers are frequently unable to obtain information regarding certification schemes, which hinders their ability to decide whether or not to participate (46).

The results of the factors influencing cocoa farmers' willingness and involvement in certification programs are shown in Table 4, which shows that the major variables for willingness and participation are very different. The findings from the Probit regression model shows that the model is well fitted with Chi- Square value of 111.87, df=183, p < 0.00). The significant determinants of willingness to participate in cocoa certification are ethnicity (p < 0.05), marital status (p < 0.10), religion (p < 0.001), income (p < 0.001), and participation in extension services (p < 0.001). When cooperative-based certification models were used, ethnicity had no discernible impact, suggesting that group-based strategies could lessen ethnic differences (47). Farmers' belief in certification programs was influenced by their religious connection;

however, when certification was associated with economic rewards, religion had little to no impact, indicating that in certain situations, financial incentives may take precedence over religious considerations (48, 49). In order to guarantee higher market prices, farmers with lower incomes were more likely to take part in certification (50).

The variables influencing cocoa farmers' involvement in certification programs are revealed by the linear regression analysis (Table 4). The model is significant with F value of 1.96, $df = 198$, and $p = 0.033$. With an R-squared value of 0.120, the model indicates limited explanatory power, with the included factors accounting for around 12.0 % of the variance in participation. The significant determinants of participation in cocoa certification are educational level ($p < 0.001$), Participation in extension services ($p < 0.10$), Constraint of extension services ($p < 0.10$), Impact of extension constraint ($p < 0.001$). Age, access to support services, and farmers' comprehension of certification requirements were all significant predictors of compliance (51); while others noted that higher participation rates were linked to larger farms and active participation in farmer groups, underscoring the importance of social capital and resource accessibility in the adoption of certification (52). Market access, price surcharges, and the perceived advantages of certification all affect the uptake of certification programs (53).

CONCLUSIONS

- This paper provides empirical evidence on the factors influencing willingness and participation in cocoa certification programs among farmers in Sierra Leone. According to the research, most cocoa growers are married, young, in the labour force, have little education, and have fewer than seven dependents, with the radio was the most common source of information.
- Most respondents view certification programs as beneficial, pointing out their role in promoting ethical farming techniques, their influence on the quality of cocoa seeds, and their significance in controlling prices.
- Bureaucratic obstacles, high certification expenses, and difficulties obtaining technical help all make it difficult to participate in certification programs.
- Data from certification programs reveal that they face major obstacles that restrict the involvement of cocoa farmers. For farmers seeking these opportunities, structural obstacles include high costs, lack of experience, land tenure issues, and regulatory complexity.
- Low engagement is influenced by gender biases, sociocultural barriers, and ignorance. Despite the fact that certification is meant to advance market access and farming standards, varying opinions among certification officers suggest a discrepancy between the anticipated and actual benefits.

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