

## Cocoa Farmers' Willingness to Pay for Improved Extension Services in Ghana

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### ABSTRACT

*Agricultural extension services play a pivotal role in enhancing the productivity, resilience, and sustainability of farming systems, particularly for smallholder farmers. In Ghana, cocoa farming remains a vital economic activity, contributing significantly to livelihoods and national revenue. However, the effectiveness of extension service delivery has often been limited by inadequate resources, infrequent farm visits, and a lack of tailored support to address farmer-specific needs. As farmers increasingly face challenges, the demand for improved extension services has become more urgent. This study explores cocoa farmers' willingness to pay (WTP) for improved extension services in Ghana. The research employed a cross-sectional survey design, selecting 394 respondents through the multi-stage sampling process. Majority of the farmers were willing to pay for improved extension services, thus, arrangement for the supply of inputs, financial literacy and farm management training, and access to high-quality, certified seeds. Factors influencing willingness to pay included age, household size, household headship, farm size, sex, farming experience, access to credit, and skilled labour. There is strong consensus on three critical features of an improved extension system: the frequency of farm visits, prompt response from extension agents, and availability of essential tools and equipment. For improved extension services, the Ghana Cocoa Board must design and promote financial mechanisms that facilitate farmers' ability to pay for extension services through flexible payment options or subsidies for disadvantaged farmers.*

**Keywords:** Cocoa Farmers; Willingness to pay; Improved; Extension Service Delivery; Ghana

### INTRODUCTION

Agricultural extension service delivery encompasses a range of activities designed to furnish farmers and rural stakeholders with the necessary information and services to enhance their technical, organisational, and managerial skills, thereby improving their

living conditions and overall welfare (Raji et al., 2024). The development of extension service delivery in the cocoa sub-sector is continuously being modified. Before 1998, the Ghana Cocoa Board (COCOBOD) was the authorised agency responsible for the running of cocoa extension services. In the year 2000, cocoa extension

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was then fused into the Ministry of Food and Agriculture (MoFA) extension portfolio with the objective of delivering an economical system of extension to farmers (Amezah and Mensah, 2002).

Over the years, the Ghanaian government has produced hundreds of agricultural extension agents from the six agricultural colleges throughout the country; however, only a few are absorbed into government sectors like MoFA, COCOBOD and Ministry of Fisheries and Aquaculture. The rest are in the private sector or are unemployed doing their own jobs (Amezah and Mensah, 2002). Governments' declining development budgets and exceptionally miserable advancements in improving the economic and societal welfare of the population using state extension have resulted in a rise in demands for commercialisation or cost-sharing in the running of extension services (Okoro et al., 2006). Funding is the main factor affecting Ghana's agricultural extension services, and the monitoring of the inputs and outputs of the extension service personnel fell apart, creating more challenges in the eyes of the public (Amoah, 2013). Funding of agricultural extension services under the government is confronted with constraints like scanty monetary allotment and frozen employment (Speranza et al., 2009).

Agricultural extension services are crucial for improving farming practices, leading to increased productivity and better living conditions (Nwaobiala and Okpara, 2017). For example, cocoa farmers can use artificial hand pollination to boost productivity (Danso-Abbeam et al., 2018; Kair et al., 2019). These services provide information on improved farming techniques and expertise, offer training programmes, and communicate strategies. However, they must continuously evaluate new data and adapt to farmers' needs. Government-

sponsored agricultural extension programs often fail to adapt to varying needs, lack ownership, and lack quality staff. Consequently, they result in increased economic benefits for farmers (Nwaobiala and Okpara, 2017; Idachaba, 2005). The delivery of extension services is solely the responsibility of the government and significantly enhances cocoa production in Ghana (Temesgen and Tola, 2015).

African agricultural progress depends fundamentally on the prompt distribution of essential information to farmers (Anang et al., 2020; Rivera and Sulaiman, 2009). The effort to commercialise agricultural extension services (AESs) has not achieved the intended results in several developing nations, like Ghana. Currently, there is a growing need for agricultural extension services to efficiently address farmers' requirements in terms of output (Rivera and Sulaiman, 2009; Anang et al. 2020). Several advanced countries have charted a paradigm shift in the direction of regionalisation, contracting and subcontracting, public-private partnerships, privatisation, and amplified participation of non-governmental agencies in agricultural extension services provision (Zwane, 2016; Sylla et al. 2019). The result is cost-effective public expenses on these facilities and the better involvement of private and other interested parties. Additionally, lessons drawn from some African countries point to the fact that commercialised extension services are superior to those that are outright state-owned in providing valuable services (Sylla et al., 2019).

However, a logical step to fully commercialise cocoa extension services is to understand the willingness of cocoa farmer to pay for an improved system different from the one currently provided free by government. There are numerous studies on willingness to pay for private extension services (Danso-Abbeam et al., 2014; Anang et

al. 2020; Ejeta et al. 2019; Zwane, 2016; Sylla et al., 2019) and the factors that influence farmers' willingness to pay for private extension services (Shausi et al., 2019). However, there is limited empirical evidence on cocoa farmers' willingness to invest financially for improved cocoa extension services in Ghana. Therefore, this study aims at evaluating cocoa farmers' preparedness and readiness to contribute to an improved extension delivery system that meets their exact perceived requirements. The specific objectives are to: 1) assess farmers' willingness to pay for an improved cocoa extension service system; 2) identify services on which farmers are willing to pay for; 3) determine the factors that affect cocoa farmers' willingness to pay for extension services; 4) assess farmers' desired features of an improved system of extension delivery in the cocoa sector; 5) analyse farmers' perceived constraints to extension service delivery.

The key contribution of this study lies in addressing a significant gap in the literature by providing empirical evidence on cocoa farmers' willingness to financially invest in an improved extension service delivery system in Ghana. Unlike previous studies that predominantly focused on private extension services or the challenges of extension delivery, this research provides a detailed understanding of farmers' willingness to pay, their preferences for particular services, and the socio-economic factors that affect these choices. By assessing farmers' desired features for an improved system and identifying perceived constraints, the study delivers actionable insights that can inform the Ghana Cocoa Board, policymakers, and stakeholders in designing a sustainable and demand-driven extension model. This contribution is critical in transitioning from government-subsidized systems to a more commercialized approach, ensuring that extension services align with farmers' needs while remaining financially viable.

## METHODOLOGY

The study area was the Wassa Amenfi Municipality in Ghana's Western Region. Amenfi Central borders the municipality to the west, Mpohor Wassa East borders it to the east, Prestea Huni Valley borders it to the south, and the Upper Denkyira East and West Districts border it to the north. The division of the previous Wassa Amenfi District established the municipality in 2004. The entire land area comprises 1,729 square kilometers. Sekondi-Takoradi, the regional administrative centre, is 180 km away from the municipality's capital, Wassa Akropong (GSS, 2021).

This study utilized an exploratory research design that focused exclusively on quantitative frameworks. The research employed a cross-sectional survey design, entailing the collection of data at a singular moment from a sample of respondents drawn from the target population. Additionally, the survey design facilitated the collection of quantitative data, enabling statistical techniques to identify patterns, trends, and relationships among variables.

The target population for the study was farmers who are involved in cocoa production as a major means of living. The researchers believe that since the target farmers receive some form of extension services from the Ghana Cocoa Board, they should be able to express their independent opinions about the challenges they face and the requirements they have for an ideal service delivery system. All thirteen extension operational areas across the municipality constitute the population.

The study employed a multi-stage sample technique, with simple random sampling used in the first and second phases for the region and the municipality, respectively. In the third stage, a systematic random selection procedure was employed to select respondents from various

communities, thereby forming the sample for the entire study within the municipality. The researchers collected data from farmers via the Cocoa Health and Extension Division (CHED) of the Ghana Cocoa Board (COCOBOD) at the district office in Wassa Akropong, the municipality's capital. This division provided a list of cocoa farmers from the Cocoa Management Systems (CMS) database, indicating that the municipality currently has 27,392 cocoa farmers (COCOBOD, 2015). We calculated the sample size using Yamane's sample formula. Thus, we obtained a sample of 394.

We used structured questionnaires to collect primary data from cocoa farmers in the municipality for the study. By directly engaging with the cocoa farmers, we obtained firsthand information. We fully anonymised the obtained data, making it impossible to trace it back to individual participants. Also, respondents willingly participated in the research and provided written consent on the questionnaire before they participated in the study. The objectives of the study We explained the study's objectives to them and assured them of the confidentiality of their information and anonymity of their identities. We gave respondents ample time to complete the questionnaire. We did not offer financial incentives to influence participation or responses. We encouraged participants to skip any questions they found uncomfortable, but also advised them to approach the questionnaire thoughtfully and deliberately.

The researchers conducted face-to-face interactions. Five trained enumerators, familiar with the local context and fluent in the Akan language, administered the structured questionnaires to ensure consistency and reliability in data collection. The enumerators followed a standardised protocol to ensure consistency and minimize interviewer bias. Data were collected using paper-based questionnaires.

We conducted the surveys over four weeks in July-August 2023 to ensure comprehensive data collection while accommodating farmers' availability and scheduling constraints.

We extensively used the Statistical Package for the Social Sciences (SPSS) software. We analysed the socioeconomic characteristics of cocoa farmers using descriptive tools like mean, standard deviation, percentages, and frequency. We assessed farmers' willingness to pay for improved cocoa extension services using descriptive statistics like frequencies and percentages. We used Kendall's Coefficient of Concordance to assess farmers' desired features of an improved extension delivery system and examine the challenges to extension service delivery.

To determine the socio-economic factors that affect cocoa farmers' WTP for extension services, the binary probit model was employed. The binary probit model is specifically designed to analyze binary outcome variables, where the dependent variable takes on only two possible values, such as 0 (no) and 1 (yes). In this study, it was modelled as willing (1) and not willing (0). The binary probit model estimates the probability that the outcome variable equals one of the two possible values based on a set of predictor variables (socio-economic characteristics). It provides a probabilistic interpretation of the relationship between the predictors and the likelihood of the outcome occurring, making it useful for understanding the likelihood of binary events. The probit model allows for the specification of nonlinear relationships between the predictor variables and the log-odds of the outcome variable. This flexibility enables researchers to capture complex relationships that linear models might not be able to adequately represent, providing a more accurate depiction of the data.

## FINDINGS AND DISCUSSION

### Socio-economic Characteristics of Cocoa Farmers

Table 1 presents the socioeconomic characteristics of farmers in the study area, focusing on discrete variables such as sex,

marital status, household headship, engagement in off-farm activities, land ownership, access to extension services, credit access, and cooperative membership, as well as continuous variables including age, years of education, household size, farm size (in acres), and farming experience.

**Table 1: Socioeconomic Characteristics of Farmers**

Sl.No.	Variables	Frequency	Percentage
1	Sex		
	Male	289	73.35
	Female	105	26.65
2	Marital Status		
	Single	26	6.60
	Married	301	76.40
	Divorced	26	6.60
	Widowed	41	10.41
3	Household headship		
	Yes	309	78.43
	No	85	21.57
4	Off-Farm Activity		
	Yes	210	53.30
	No	184	46.70
5	Land Ownership		
	Land owner	238	60.41
	Abunu/Sharecropping	128	32.49
	Caretaker	28	7.11
6	Extension Access		
	Yes	392	99.49
	No	2	0.51
7	Credit Access		
	Yes	99	25.13
	No	295	74.87
8	Co-operative Membership		
	Yes	338	85.79
	No	56	14.21

Sl.No.	Continuous Variables	Mean	Std. Dev.	Min	Max
9	Age	51.218	12.355	23	79
10	Years of Education	5.594	5.301	0	13
11	Household size	6.858	3.289	1	31
12	Farm size (Acres)	8.121	6.546	1	60
13	Farming experience	23.416	12.347	3	78

The results indicate a primarily male sector with 73.35 percent of respondents identifying as male and 26.65 percent as female. Despite the predominance of male farmers, the growing recognition of women's role in agriculture, especially in specific tasks and crop production, underscores the need for policies that foster gender equity in agricultural practices (Fanelli, 2022). Married women make up the majority (76.40%), aligning with previous studies' findings that marital status affects agricultural participation. About 78.43% serve as heads of households, indicating their central role in decision-making (Hauwa et al., 2022). More than half of the farmers (53.30%) participate in off-farm activities to augment their income, whereas 46.70 percent depend exclusively on agriculture. Concerning land ownership, 60.41 percent possess their land, 32.49 percent engage in sharecropping, and 7.11 percent serve as caretakers. Extension services are broadly accessible, with 99.49 percent of farmers indicating accessibility. Cooperative membership is notably high; 85.79% of farmers are affiliated with farmer-based organisations.

The mean age of farmers is 51 years, indicating an ageing demographic involved in cocoa cultivation. However, ageing may reduce involvement in critical farming activities, particularly among older farmers (Ayodele, 2020). The average educational attainment is about six years, indicating a lack of formal education among the farmers. Households average approximately seven individuals,

indicating considerable familial participation in agricultural endeavours (Tetteh and Asase, 2017). Many farmers rely on family members for labour, which is essential given the physical demands of cocoa farming (Diawo, 2022). The mean farm size is 8.12 acres, with a broad spectrum ranging from one to 60 acres, illustrating the varied scope of agricultural operations among cocoa farmers. The average farming experience is 23 years, indicating substantial practical knowledge (Guest et al., 2023).

#### Farmers' Willingness to Pay for Private Extension Services

The results presented in Figure 1 provide insights into farmers' willingness to pay for improved extension service delivery.

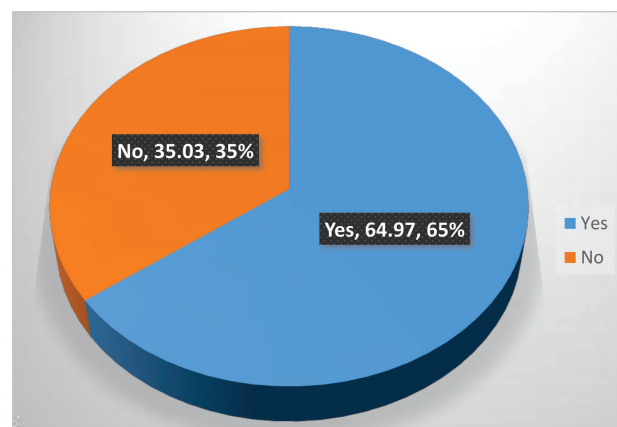


Figure 1: Farmers' Willingness to Pay for Private Extension Services

Out of the 394 respondents who were interviewed, 256 farmers expressed their

willingness to pay for the improved extension services, representing 64.97 percent of the total respondents. This indicates that the majority of cocoa farmers recognise the value of improved agricultural extension in enhancing productivity, profitability, and overall agricultural development (Silamat et al., 2024). Conversely, 138 farmers, representing approximately 35.03

percent of the total respondents, expressed their reluctance to pay for the improved extension services. This suggests a notable segment of the farming population may have concerns or reservations regarding the perceived benefits, cost-effectiveness, or accessibility of the proposed improvements (Ozor et al., 2013).

### Services Farmers Are Willing to Pay For

The results presented in Table 2 show the extension services for which cocoa farmers are willing to pay.

**Table 2: Extension Services Farmers are Willing to Pay For (n=256)**

Sl.No.	Improved Cocoa Extension Services	Willing to Pay	
		No.	%
1	Arrangement for the supply of inputs	231	90.23
2	Financial literacy and farm management training	211	82.42
3	Access to high-quality, certified seeds	208	81.25
4	Training of volunteer extension agents and local facilitators	128	50.00
5	Timely pest and disease management advisory services	121	47.27
6	Access to soil fertility testing and analysis services.	124	48.44
7	Climate-smart agriculture training workshops	147	57.42
8	Organizing adult literacy classes	161	62.89
9	Teaching home management and family nutrition	158	61.72
10	Precision farming tools and advisory services	179	69.92
11	Access to mechanisation services	188	73.44
12	Farm visits to address specific issues	214	83.59
13	Cocoa insurance packages tailored to climate risks	90	35.16
14	Involvement in non-farming activities	90	35.16
15	Assisting to process and recover loans	203	79.30
16	On-demand consultancy with agronomists or experts	155	60.55
17	Liaison with LBCs	82	32.03
18	Training on post-harvest management to reduce losses	88	34.38
19	Digital platforms for accessing information	165	64.45
20	Weather forecasting and real-time alerts via SMS or mobile apps	114	44.53

A majority of farmers (90.23%) expressed their willingness to pay for the arrangement of input supplies, highlighting the critical need for reliable access to inputs (Abebe, 2023). Similarly, services such as financial literacy and farm management training (82.42%), access to high-quality certified seeds (81.25%), and farm visits for addressing specific issues (83.59%) rank highly, indicating their perceived relevance to improving farm productivity and management. The high interest in financial literacy and farm management training suggests that farmers value knowledge that can enhance their operational efficiency (Ikoyo-Eweto et al., 2024). Additionally, a notable proportion of farmers are willing to pay for assistance in processing and recovering loans (79.30%) and access to mechanisation services (73.44%), reflecting a strong interest in financial stability (Abebe, 2023) and modern farming techniques (Sahu et al., 2024). About

64.45% showed interest in digital information access, which aligns with trends in agricultural digitalisation (Wang et al., 2024). Moderate interest (62.89% and 61.72%, respectively) suggests a recognition of the broader impacts of education on farming success (Abebe, 2023). Conversely, lower willingness for less direct benefits, such as liaising with Licensed Buying Companies (32.03%) and non-farming activities (35.16%), may indicate a preference for more tangible, immediate benefits that directly impact farm productivity and income.

### Factors Affecting Cocoa Farmers' Willingness to Pay

In Table 3, the analysis of the factors influencing farmers' willingness to pay was conducted using a binary probit regression model are presented.

**Table 3: Factors Influencing Cocoa Farmers' Willingness to Pay**

Sl.No.	Socio-Economic Factors	Coefficient	Std Error
1	Age	-0.028***	0.011
2	Marital status	-0.191	0.126
3	Years of education	0.014	0.016
4	Household size	0.069**	0.030
5	Household head	0.62**	0.259
6	Off-farm activity	-0.04	0.159
7	Land ownership	-0.099	0.129
8	Farm size	-0.048***	0.018
9	Sex	0.598***	0.187
10	Farming experience	0.029**	0.011
11	Bags of cocoa harvested	0.004	0.004
12	Cooperative membership	0.153	0.200
13	Access to credit	-0.558**	0.249



Sl.No.	Socio-Economic Factors	Coefficient	Std Error
14	Religion	-0.13	0.184
15	Access to skilled labour	0.775***	0.165
	Constant	0.25	0.577
	Mean dependent var=0.650; SD dependent var=0.478; Pseudo r-squared =0.481; Number of obs=394; Likelihood ratio $X^2(15)$ =92.129; Prob > chi2=0.000; Log likelihood =-209.091		

Among the significant factors, age has a negative and significant effect (-0.028), suggesting that older farmers are less inclined to pay for these services. This result conforms to other studies by Gebreegziabher and Mezgebo (2020) and Shausi et al. (2019). The common belief is that elderly individuals tend to value traditional practices, making them less inclined to endorse the concept of paying for new ideas. This implies that when change is not considered necessary, the need for enhanced extension services decreases, thereby removing the need for payment.

Farm size is negative and statistically significant at the 1% level, indicating that farmers with relatively larger farms are less likely to be willing to pay for improved extension services. This finding suggests that as farm size increases, the motivation to pay for such services decreases. Farmers with larger farms may already possess more extensive resources, including land, capital, and machinery. They might have the capacity to rely on internal resources or alternative means of obtaining agricultural information and technical assistance, thus reducing their perceived need for external extension services. Larger farms often benefit from economies of scale, allowing them to spread costs over a larger production base. They may perceive the marginal benefits of investing in

improved extension services as relatively lower compared to smaller-scale farms, where the potential impact of such services on productivity and profitability could be more pronounced. Farmers managing large operations may have developed internal expertise or employed specialised staff to address agronomic challenges, adopt new technologies, and optimize production practices. They may rely more heavily on in-house knowledge and experience, potentially diminishing their reliance on external extension services. Farmers with larger operations may have higher expectations regarding the quality, relevance, and timeliness of extension services. If they perceive existing extension programmes as inadequate or poorly tailored to their needs, they may be less willing to pay for additional services, preferring to invest resources elsewhere or seek alternative sources of agricultural information and support.

In contrast, being a household head (0.62) and farming experience (0.029) positively and significantly affect willingness to pay, indicating that decision-makers and experienced farmers are more likely to value and invest in these services. The positive and significant effect of being a household head (coefficient = 0.62) suggests that farmers who are primary decision-makers within their households tend to show

a greater willingness to pay for improved extension services. This is likely because household heads are typically more involved in managing farm operations and making strategic decisions to enhance productivity and sustainability. As key decision-makers, they may also have a stronger sense of responsibility for improving the livelihoods of their families, motivating them to invest in services that could benefit the household (Olumba and Olumba, 2024). Similarly, farm experience (coefficient = 0.029) positively influences willingness to pay, indicating that experienced farmers are more inclined to recognize the value of extension services. With years of farming, they likely have a deeper understanding of the challenges in cocoa production and the potential benefits of expert advice, training, and access to improved farming practices. This awareness may drive their willingness to invest in services that could help address these challenges, improve productivity, and secure long-term benefits for their farms (Akinrotimi et al., 2024).

Sex has a significant positive effect at the 1% confidence level. Male farmers are more inclined to show a willingness to pay for improved extension services compared to female farmers. Female farmers often face greater constraints in accessing land, credit, inputs, and productive assets compared to their male counterparts. Limited access to resources may diminish their capacity to invest in improved extension services, despite their potential benefits for improving agricultural productivity and livelihoods. Women in agriculture typically bear multiple responsibilities, including household chores, childcare, and other income-generating activities. Balancing these responsibilities with farm management duties can leave female farmers with limited time and energy to engage with extension services or participate in training and capacity-building programmes (Shausi et al., 2019).

Similarly, farming experience (coefficient = 0.029) positively influences willingness to pay. Experienced farmers are likely more familiar with the benefits of extension services after having observed or used similar services over time. Their accumulated knowledge and long-term perspective may lead them to value extension services as essential for maintaining or improving productivity and profitability. Access to skilled labour (coefficient = 0.775) significantly enhances farmers' willingness to pay for improved extension services, likely because skilled labour directly contributes to better farm productivity and efficiency. Skilled workers bring expertise that can optimize farming operations, making investments in extension services more appealing and relevant. Farmers with access to such labour may perceive improved extension services as complementary tools to further enhance their farm outcomes, which motivates them to allocate resources for these services (Ragasa and Mazunda, 2018). Conversely, access to credit (coefficient = -0.558) negatively influences willingness to pay, potentially indicating that farmers who have access to credit might already prioritise other investments or expenses over extension services. Alternatively, this finding could suggest that credit-constrained farmers may face financial limitations, leaving them unable to allocate funds for additional services even if they recognize their benefits. The inverse relationship underscores the importance of financial flexibility in influencing farmers' capacity to pay for improved extension services (Moahid et al., 2021).

### **Farmers' Preferred Features of Extension Service Delivery**

The results presented in Table 4 offers insights into how respondents ranked various attributes of private extension services based on their perceived importance.

**Table 4: Farmers' Preferred Features of Extension Service Delivery**

Sl.No.	Features of Improved Cocoa Extension Services	Mean	Rank
1	Frequency of farm visits	1.38	1 <sup>st</sup>
2	Promptness of agents	2.19	2 <sup>nd</sup>
3	Availability of relevant tools & equipment	4.07	3 <sup>rd</sup>
4	Good communication	4.24	4 <sup>th</sup>
5	Good form of mobility for agents	5.25	5 <sup>th</sup>
6	Inclusion of marginalised groups in extension activities	6.30	6 <sup>th</sup>
7	Good agent-farmer relationship	7.22	7 <sup>th</sup>
8	Language localisation of extension materials and advice	7.32	8 <sup>th</sup>
9	Proximity of agent	7.73	9 <sup>th</sup>
10	Relevance of service/extension programme	9.30	10 <sup>th</sup>
	N=394; Kendall's Wa=0.703; Chi-Square=2492.427; Df=9; Asymp. Sig.=0.000		

The obtained Kendall's W value of 0.703, significant at the 1% level, indicates substantial agreement among respondents about the relative importance of the listed features. "Frequency of farm visits" leads the list of attributes, holding the top spot with a mean rank of 1.38. This accentuates the crucial role of regular visits by extension agents to farms. Such frequent visits enable agents to offer timely advice, track progress, and address challenges or queries faced by farmers on-site. Research indicates that farm visits have a significant impact on farmers' satisfaction with extension services and help moderate their expectations (Ganpat et al., 2017). Frequent farm visits positively correlate with improved technology performance, as demonstrated in a study on greenhouse technology in Kenya (Omoro et al., 2015). Extension staff visits are considered one of the most effective individual contact methods for disseminating agricultural technologies, ranking first among various approaches. However, the high dependence on

farm visits raises sustainability concerns due to their cost (Ganpat et al., 2017). The 'promptness of agents' attribute is closely followed, achieving the 2<sup>nd</sup> rank with a mean rank of 2.19. This underscores the importance of agents' responsiveness and timeliness in addressing farmers' concerns and providing assistance when required. Studies have shown that timely access to inputs and information is a critical priority for farmers (Sajesh and Padaria, 2019). Factors such as quick availability, reliability, and timeliness of information influence the effectiveness of agricultural expert systems (Ravi and Allan, 2016).

With a mean ranking of 4.07, the 'availability of relevant tools and equipment' ranks 3<sup>rd</sup>. This feature underscores the significance of equipping extension agents with suitable tools and resources, which enhances their ability to provide effective services. Studies have shown that information and communication technologies

(ICTs) play a significant role in enhancing extension agents' capabilities. Extension agents generally prefer user-friendly digital decision support tools that provide accurate, detailed information while being time-efficient (Oyinbo et al., 2020). Good communication, ranked fourth with a mean score of 4.24, is a cornerstone of effective extension services and has far-reaching implications for agricultural development. In the context of improved extension services, communication serves as the backbone for transferring knowledge, skills, and information to farmers, ensuring that critical messages about sustainable practices, pest management, or climate adaptation are understood and implemented effectively (Ljajić and Piršl, 2021).

## CONCLUSION

Majority of cocoa farmers are willing to invest in improved extension services. The top three services farmers are most inclined to pay for include arrangement for the supply of inputs (90.23%), financial literacy and farm management training (82.42%), and access to high-quality, certified seeds (81.25%). Key socio-economic factors influencing farmers' WTP for the improved services include age, household size, household headship, farm size, sex, farming experience, access to credit, and skilled labour. There is strong consensus on three critical features of an improved extension system: the frequency of farm visits, prompt response from extension agents, the availability of essential tools and equipment, and good communication.

Extension services should establish partnerships with input suppliers to ensure timely availability of high-quality seeds, fertilisers, and other essentials. Subsidised pricing or flexible payment options could further increase access for farmers. Extension programmes should integrate financial literacy and farm management training

into their regular curriculum. Workshops, field demonstrations, and farmer-based organisations can be leveraged to deliver tailored training that aligns with local needs. Extension services should collaborate with certified seed producers to guarantee farmers access to improved cocoa varieties. Mechanisms such as seed fairs, distribution networks, and certification schemes should be reinforced to maintain trust and quality assurance.

Tailored strategies should be developed to address the unique needs of younger farmers, larger households, and female farmers, ensuring inclusivity in service delivery. Frequent and purpose-driven farm visits should be institutionalised to build trust and enhance advisory quality. Extension officers should proactively identify farmer challenges during visits, offering timely and actionable solutions. Good communication is a critical feature of extension systems. Training programmes for extension agents should include communication skills development, ensuring they can convey technical information in simple, actionable ways. Two-way feedback channels should also be established, such as helplines, farmer forums, or mobile apps. Extension systems must have mechanisms to respond quickly to farmer concerns, particularly those related to pest and disease outbreaks. A rapid response team or hotline service could be developed to address emergencies effectively. Essential tools and equipment should be made available for both extension officers and farmers. Partnerships with financial institutions could help establish low-interest loans or savings schemes tailored for cocoa farmers. Access to skilled labour significantly enhances willingness to pay. Extension systems should therefore prioritise training volunteer extension agents, local facilitators, and farmhands in modern agricultural practices to support farmers effectively.

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