ASSESSMENT OF AGRICULTURAL EXTENSION SERVICES UTILIZATION AMONG COCOA FARMERS IN IKOM AGRICULTURAL ZONE, CROSS RIVER STATE, NIGERIA.

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Abstract
The study assessed the utilization of agricultural extension services among cocoa farmers in the Ikom Agricultural Zone of Cross River State, Nigeria. Specifically, the study described the socioeconomic characteristics of farmers in the study area, identified extension services available to them, examined their perception to extension services and identified the constraints to the utilization of extension services. A multistage sampling procedure was employed to select respondents, and data were analyzed using descriptive statistics. Results revealed that the majority of cocoa farmers (44%) were within the age range of 41–50 years, predominantly male (88%), and married (70%), with 87% possessing some level of formal education. Most respondents (65%) cultivated between 1–5 hectares of farmland, while 81% were members of cooperative societies, which facilitated information sharing and collective access to extension services. The major extension services utilized include dissemination of improved planting materials, pest and disease management support, training on production techniques, and climate-smart agricultural practices, all of which were perceived to significantly enhance productivity. Farmers strongly agreed that extension services improved their knowledge of modern production techniques (mean = 3.5) and contributed to yield increases (mean = 3.3). However, constraints to utilization included political and institutional instability, poor funding, low literacy levels, high costs, and inadequate number of extension agents. The study concludes that extension services are vital for improving cocoa production, but their effectiveness depends on overcoming the identified constraints.
Key words*: cocoa production, extension services, Ikom agricultural zone*

Introduction

Cocoa (*Theobroma cacao*) is one of the most important cash crops in Nigeria and a major source of non-oil export earnings. The country is currently the fourth largest producer globally, with output estimated at 280,000–320,000 metric tons in the 2022/23 season (Reuters, 2025; Nairametrics, 2025). Production is concentrated in the humid forest belt, particularly in states such as Ondo, Cross River, Ogun, Ekiti, Osun, Edo, Abia, and Imo, where smallholder farmers dominate cultivation. Cocoa industry grapples with aging plantations, low farm-level productivity, pests and diseases, infrastructural bottlenecks, and underdeveloped processing capacity, which constrain Nigeria's competitiveness in the global cocoa value chain (Daily Sabah, 2025). Enhancing extension services delivery, promoting youth participation, and expanding value addition are therefore crucial for revitalizing cocoa production and ensuring its sustainability in Nigeria's agricultural economy.

Cocoa production plays a central role in the rural economy of Cross River State, positioning the state as one of Nigeria's leading cocoa-producing regions after Ondo. The crop is predominantly cultivated in areas such as Ikom, Boki, Etung, Obubra, and Yakurr, where it serves as a major source of household income, employment, and foreign exchange earnings (Effiong and Effiong, 2015; FAO, 2021). Cocoa contributes significantly to the livelihoods of smallholder farmers, providing funds for food security, education, health care,

and other socio-economic needs. At the macro level, the crop enhances Cross River's contribution to Nigeria's non-oil exports, especially as cocoa accounted for over 35% of the country's non-oil export value in early 2025 (Reuters, 2025). Beyond its economic role, cocoa farming supports environmental sustainability by encouraging agroforestry practices that conserve soil fertility and biodiversity (Obok, Effiong, and Okon, 2020). Strengthening extension services, investing in local processing industries, and engaging youth in cocoa agribusiness remain crucial pathways for maximizing the importance of cocoa to Cross River State's agricultural development.

Cocoa farmers in Cross River State are predominantly smallholder producers, cultivating between 1–5 hectares of land, often with mixed cropping systems that combine cocoa with food crops such as cassava, plantain, and yam (Effiong and Effiong, 2015; Obok, Effiong, and Okon, 2020). Cocoa farming is a major livelihood activity, providing income for education, healthcare, and food security, and serving as a critical source of employment for rural youth and women through activities such as harvesting, pod-breaking, and processing (FAO, 2021). Rising global cocoa prices and increasing demand present opportunities for cocoa farmers in Cross River to expand production and integrate more fully into the international value chain (Reuters, 2025; Daily Sabah, 2025).

Agricultural extension services are critical to improving the productivity, quality, and sustainability of cocoa production, particularly among smallholder farmers who dominate the sector in Nigeria. Extension agents provide farmers with technical knowledge on good agricultural practices (GAPs) such as proper spacing, pruning, pest and disease control, soil fertility management, and post-harvest handling techniques, all of which are essential for increasing yields and meeting international quality standards (Anderson and Feder, 2007; FAO, 2021). In cocoa-producing regions like Cross River and Ondo States, extension delivery also facilitates access to improved seedlings, agrochemicals, credit, and market information, thereby enhancing farmers' capacity to respond to climate variability and fluctuating global prices (Arokoyo, 1998; Effiong and Effiong, 2015). Moreover, extension services help farmers adapt to sustainability requirements, such as the European Union's deforestation-free regulations, by promoting traceability systems and agroforestry practices (Daily Sabah, 2025; Reuters, 2025). Despite these benefits, the effectiveness of extension in cocoa production is often constrained by inadequate staffing, poor funding, weak farmer-to-agent ratios, and limited use of digital platforms, leading to low utilization and uneven impact across farming communities (Swanson and Rajalahti, 2010; Davis *et al*., 2012). Strengthening extension delivery through public private partnerships, cooperative-based training models, and digital advisory platforms is therefore vital for enhancing the role of extension in revitalizing Nigeria's cocoa subsector. Thus, improving access to extension services, inputs, and processing facilities remains a key pathway for sustaining cocoa production and ensuring its role in economic development and poverty reduction in Nigeria. Therefore, the specific objectives of this study are:

1. to describe the socioeconomic characteristics of the respondents
2. to identify extension services available to the respondents
3. to examine the perception of farmers to extension services
4. to identify the constraints to the utilization of extension services.

Materials and Methods

Study Area: This study was carried out in Central Agricultural Zone, Cross River State. Geographically, the zone lies approximately between latitude 5°30′N and 6°30′N and longitude 8°00′E and 9°00′E. It is bounded to the north by Obudu and Ogoja LGAs (Northern Zone), to the south by Akamkpa and Biase LGAs (Southern Zone), to the east by the Republic of Cameroon, and to the west by Ebonyi State. The zone is composed mainly of

Abi, Yakurr, Obubra, Ikom, Boki, and Etung Local Government Areas, which are characterized by fertile soils, dense rainforest vegetation, and favorable climatic conditions for tree crop cultivation. The zone serves as the cocoa belt of Cross River State, with Ikom, Boki, and Etung standing out as the largest cocoa-producing areas (Effiong & Effiong, 2015). Farming in the zone is largely dominated by smallholder households who cultivate cocoa alongside food crops such as cassava, yam, and plantain, thereby ensuring both income and food security (Ekpo & Udo, 2018).

Sample Size and Sampling Technique

This study adopted a multi-stage sampling procedure to select the respondents. In the first stage, three agricultural blocks (Boki, Etung and Ikom), were purposively selected. This selection was based on the fact that these blocks are predominantly involved in cocoa production within the Ikom agricultural zone. In the second stage, a simple random sampling technique was employed to select five villages from each of the selected agricultural blocks. Simple random sampling was adopted to ensure that every village in the selected blocks had an equal chance of being included in the sample, thereby minimizing bias and enhancing the representativeness of the sample. These villages were: Iso-Bendeghe, Nsadop, OKundi, Biajua and Boje for Boki block; Agbokim, Ajassor, Effraya, Etomi and Nsofang for Etung block and; Akparabong, Adijinkpo, Nde, Ofutop I and Ofutop II for Ikom block. In the third stage, ten cocoa farmers were purposefully selected from each of the villages in all the selected blocks, giving a total of one hundred and fifty (150) respondents. Data collected were analyzed using descriptive statistics such as frequencies, percentages, and means.

Results and Discussion

Distribution of Respondents by their Socioeconomic Characteristics

The results presented in Table 1 indicate that many cocoa farmers (44%) fall within the age range of 41–50 years, showing that cocoa production in the study area is dominated by farmers in their most active working years. This finding is consistent with Adejori *et al*., (2022), who reported that a substantial proportion of active cocoa farmers belong to this age bracket. The results also reveal that cocoa farming is largely male-dominated (88%), reflecting the gender dynamics of cocoa production. Furthermore, 70% of the respondents were married, suggesting that marriage contributes positively to cocoa farming, as spouses provide support in decision-making and family labour. Educational attainment among respondents was relatively high, with 87% having at least some formal education. This implies that most cocoa farmers possess basic literacy skills necessary for accessing and utilizing extension services. This agrees with Agbongiarhuoyi *et al*., (2010), who observed that education significantly influences the adoption of cocoa technologies such as hybrid seedlings, agrochemicals, pruning, and fermentation, since literate farmers tend to adopt innovations more readily.

Farm size distribution shows that 65% of the respondents cultivated between 1–5 hectares, while 81% belonged to cooperative societies. Farmers with larger farm sizes require greater extension support to optimize production, while cooperative membership provides opportunities for information sharing, collective action, and access to improved technologies. This finding corroborates Kehinde *et al*., (2018), who reported that cooperative membership significantly enhances the likelihood of adopting improved cocoa practices, including hybrid seedlings, fertilizer application, and better farm management.

In addition, 59% of the respondents had exposure to training on cocoa production, while 96% owned mobile phones, enabling them to access extension services through digital platforms. Training exposure is particularly vital, as it facilitates the adoption of modern techniques that boost productivity. Kamdem (2016) also reported that participation in Farmer

Field Schools (FFS) increased cocoa yields by an average of 97 kg per hectare, highlighting the positive impact of training on productivity.

Table 1: Distribution of Respondents by their Socioeconomic Characteristics (n = 150)

Variables	Category	Frequency	Percentage
Age	<30	30	20.0
	31-40	38	25.0
	41-50	65	44.0
	51-60	17	11.0
Sex	Male	132	88.0
	Female	18	12.0
Marital Status	Single	25	17.0
	Married	105	70.0
	Divorced	12	08.0
	Widowed	08	05.0
Education	Non-formal	20	13.0
	Primary	55	37.0
	Secondary	65	43.0
	Tertiary	10	07.0
Farm size	<1 hectare	08	05.0
	1-5 hectares	96	65.0
	6-10 hectares	34	23.0
	>11	12	07.0
Membership of Cooperative	Yes	122	81.0
	No	28	19.0
Farming Experience	<5 Years	10	07.0
	6-10	20	13.0
	11-15	32	21.0
	16-20	88	59.0
Training exposure	Yes	88	59.0
	No	62	41.0
Mobile phone ownership	Yes	144	96.0
	No	06	04.0

Source: Field survey, 2025

Extension Services Available to the Respondents in the Study Area

The results in Table 2 show that dissemination of improved planting materials, pest and disease management support, training on production techniques, and climate-smart agricultural practices were the top-ranking extension services available to the respondents, ranked 1st, 2nd, 3rd, and 4th respectively. Dissemination of improved planting materials has been widely promoted as a key extension service. Dalaa *et al*., (2021) reported that more than 1,100 cocoa farmers in Ghana who received training under the Climate Smart Cocoa (CSC) initiative adopted improved seedlings and climate-smart recommendations, which led to a 30–35% increase in seedling survival rate. This highlights the positive impact of extension services that focus on improved inputs and planting materials. Similarly, Asare et al. (2020) confirmed that climate-smart practices delivered via extension channels not only improve productivity but also strengthen farmers' resilience to climate shocks. In addition, Inkoom (2020) found that farmers' perception of extension service quality was significantly

associated with their adoption of climate-smart pest and disease control measures. The study showed that higher exposure to extension services enhanced production efficiency and food security, thereby underlining the importance of pest and disease management support as a critical extension service. Furthermore, regarding training on production techniques, the Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA, 2022) program in Ghana demonstrated that training-of-trainers (ToT) cascades provided to extension agents improved farmers' knowledge and practices, leading to higher adoption of modern farming techniques and better farm outcomes.

The implication of these findings is that strengthening extension service delivery in cocoa production goes beyond routine advisory roles to include the provision of practical inputs, technical guidance, and resilience-building strategies. The availability of improved planting materials ensures that farmers can replace aging trees with higher-yielding and disease-resistant varieties, thereby sustaining productivity. Pest and disease management support not only protects farmers from devastating yield losses but also enhances efficiency and contributes to food security. Training on production techniques equips farmers with the knowledge and skills to adopt innovations, while climate-smart agricultural practices improve resilience to climate variability. Collectively, these extension services play a pivotal role in boosting cocoa productivity, enhancing farmers' livelihoods, and promoting the sustainability of cocoa production systems.

Table 2: Extension Services Available to Respondents in the Study Area (n = 150)

Extension Services Available	Frequency	Percentage	Rank
Training in production techniques	98	65.0	3rd
Information on right timing to sell produce	65	43.0	8th
Dissemination of Improved Planting Materials	120	80.0	1st
Pest and Disease Management Support	102	68.0	2nd
Soil and Fertility Management Services	29	19.0	10th
Farmer Training and Capacity Building	67	45.0	7th
Climate-Smart Agricultural Practices	89	59.0	4th
Access to Credit and Inputs	80	53.0	6th
Use of Digital Platforms	84	56.0	5th
Market linkages and Agribusiness support	60	40.0	9th

Source: Field survey, 2025

Distribution of Respondents on their Perception on Extension Services

The results presented in table 3 shows farmers' perception of the use of extension service for cocoa production. The results show that farmers perceived that extension services improve their knowledge of modern cocoa production techniques (m = 3.5), training from extension agents increased cocoa yield (m = 3.3), extension services encourage farmers to form cooperatives (m = 3.1), and extension services encourage farmers to form cooperatives (m = 2.8). These findings are supported by empirical evidence. For instance, Ajayi *et al*., (2021) reported that cocoa farmers in Ife-East Local Government Area, Osun State, highly rated extension agents' roles in training on production techniques, establishing linkages with input suppliers, and facilitating marketing arrangements. This aligns with farmers' perception that extension services improve their technical knowledge. Similarly, Kamdem (2016) found that participation in Farmer Field Schools (FFS) significantly increased cocoa yields by about 97 kg per hectare in Cameroon, confirming farmers' perception that extension training enhances productivity. Furthermore, Aidoo *et al*., (2023) also noted that producer groups and

cooperatives in Ghana serve as effective channels for extension service delivery, enabling farmers to access improved inputs, adopt technologies, and share information. This validates the perception that extension services promote collective action through cooperative formation.

The implication of these findings is that extension services are perceived not only as a source of technical knowledge but also as a driver of improved productivity and collective action among cocoa farmers. By enhancing farmers' knowledge of modern cocoa production techniques, extension services contribute to increased adoption of innovations and improved efficiency.

Table 3: Distribution of Respondents on their Perception of Extension Services (n = 150)

Perception Statements	Mean	Rank
Extension services improve my knowledge of modern cocoa production techniques	3.5*1st	
Training from extension agents has increased my cocoa yield	3.3*2nd	
Extension advice on pest and disease control reduces crop losses on my farm	2.7*5th	
Extension services help me adopt new technologies more easily	2.7*5th	
Extension services encourage farmers to form farming group	2.28th	
Extension services are accessible and relevant to my farming needs	2.8*4th	
Extension services play a vital role in improving my farm income	2.3 7th	
Inadequate extension services are a major barrier to higher cocoa production	2.7* 5th	
Lack of regular visits by extension workers reduces the benefits I gain	2.5* 6th	
Extension services encourage farmers to form cooperatives	3.1* 3rd	

*Mean values above critical value of 2.5
Source: Field Survey, 2025

Constraints to Cocoa Farmers Utilization of Extension Services

The results of the constraints to the utilization of extension services by cocoa farmers in Ikom agricultural zone shows that political and institutional instability (m = 3.0), Poor funding of extension services (m = 2.9), level of education of farmers (m = 2.8), cost of extension services (m = 2.7), and inadequate number of extension agents (m = 2.6), were considered major constraints to effective utilization of extension services in cocoa production in the Ikom agricultural zone. These findings are consistent with empirical studies across cocoa-producing regions. For instance, Nnadi *et al*., (2019) found that political interference and institutional weaknesses undermine extension service delivery in Nigeria, reducing farmers' trust and access. Similarly, Ogunlade and Babatunde (2014) reported that inadequate funding of extension services in cocoa-producing areas of South-West Nigeria limited the frequency of farmer–extension contact and weakened technology dissemination. The role of education as a constraint is also highlighted by Agbongiarhuoyi *et al*., (2010), who observed that farmers with low literacy levels were less likely to adopt improved cocoa production practices. High cost of accessing services has also been documented by Akinbile and Ndaghu (2005), who noted that the financial burden of training and input procurement often discouraged smallholder farmers from fully utilizing extension services. Furthermore, Agbamu (2011) emphasized that Nigeria faces a serious extension agent–farmer ratio crisis, with one agent often serving over 3,000 farmers, thereby constraining effective outreach and personalized advisory services.

The implication of these findings is that the identified constraints significantly hinder the effectiveness of extension service delivery and, by extension, cocoa production in the Ikom agricultural zone. If these challenges persist, they could undermine the productivity, competitiveness, and long-term sustainability of cocoa farming in the region.

Table 4: Constraints to Cocoa Farmers Utilization of Extension Services (n = 150)

Constraints	Mean	Rank
Inadequate number of extension agents	2.6*	5th
Frequency of visit	1.8	8th
Competence of extension agent	2.3	6th
Political and institutional instability	3.0*	1st
Level of education of farmers	2.8*	3rd
Cost of extension services	2.7*	4th
Distance to the farm	1.7	9th
Language barrier	1.9	7th
Poor funding of extension services	2.9*	2nd
Farmer perception and attitudes	2.7*	4th

*Mean values above critical value of 2.5
Source: Field Survey, 2025

Conclusion

This study assessed the utilization of agricultural extension services among cocoa farmers in the Ikom agricultural zone of Cross River State. The findings revealed that the majority of cocoa farmers are within their active age range, predominantly male, married, educated to some extent, and actively involved in cooperative societies-characteristics that enhance their ability to access and utilize extension services. Key extension services utilized included dissemination of improved planting materials, pest and disease management support, training on production techniques, and climate-smart agricultural practices, which were all perceived to positively influence knowledge, productivity, and collective action. Farmers generally acknowledged the benefits of extension services in improving modern production practices, increasing yields, and encouraging group participation. However, utilization was constrained by political and institutional instability, poor funding, low literacy among some farmers, high cost of services, and inadequate extension personnel. The study therefore concludes that while extension services play a pivotal role in improving cocoa productivity and farmers' livelihoods, addressing the highlighted constraints is essential to strengthen their effectiveness and ensure sustainable growth of the cocoa subsector in the Ikom agricultural zone

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Cocoa farmers' capacity should be enhanced through education and training
2. Extension services should be strengthened through the provision of adequate funding
3. Farmers' cooperative should be promoted and strengthened to enhance knowledge sharing

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