



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 utilisation of agricultural extension services among cocoa farmers in the Ikom Agricultural Zone of Cross River State, Nigeria. A multistage sampling procedure was employed to select respondents, and data were analysed using descriptive statistics. Results showed that most cocoa farmers (44%) were aged 41-50 years, predominantly male (88%), and married (70%), with 87% having 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 available included the 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 utilisation included political and institutional instability, poor funding, low literacy levels, high costs, and an 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.

Keywords: Cocoa production, Extension services, Farmers, Ikom agricultural zone, Cross River State.

INTRODUCTION

Cocoa (*Theobroma cacao*) is one of Nigeria's most important cash crops 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. The cocoa industry grapples with ageing 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 revitalising cocoa production and ensuring its sustainability in Nigeria's agricultural economy.

Cocoa production plays a central role in Cross River State's rural economy, 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 smallholder farmers' livelihoods, 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 to maximise cocoa's importance 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 also 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, extension effectiveness 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 utilisation 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 revitalising 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.

MATERIALS AND METHODS

Study Area: This study was carried out in the 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 comprises mainly Abi, Yakurr, Obubra, Ikom, Boki, and Etung Local Government Areas, characterised by fertile soils, dense rainforest vegetation, and favourable 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, five villages from each selected agricultural block were purposively selected. 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 randomly selected from each village in all selected blocks, for a total of one hundred and fifty (150) respondents. Random selection was used to ensure that every cocoa farmer in the selected villages had an equal chance of being included in the sample, minimising bias and enhancing sample representativeness. The collected data were analysed using descriptive statistics, including frequencies, percentages, and means.

RESULTS AND DISCUSSION

Distribution of Respondents by their Socio-economic Characteristics

Table 1 indicates that most cocoa farmers (44%) are aged 41-50 years, suggesting 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 have the basic literacy skills needed to access and use 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 optimise 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, fertiliser 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 2 shows 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 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 greater exposure to extension services enhanced production efficiency and food security, underscoring 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 showed that training-of-trainers (ToT) cascades for extension agents improved farmers' knowledge and practices, leading to greater adoption of modern farming techniques and better farm outcomes.

Table 1: Distribution of Respondents by their 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

These findings imply that strengthening extension service delivery in cocoa production goes beyond routine advisory roles to include practical inputs, technical guidance, and resilience-building strategies. Access to improved planting materials ensures farmers can replace ageing trees with higher-yielding, disease-resistant varieties, 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 Rank	Frequency	Percentage	
Training on production techniques	98	65.0	3 rd
Information on right timing to sell produce	65	43.0	8 th
Dissemination of Improved Planting Materials	120	80.0	1 st
Pest and Disease Management Support	102	68.0	2 nd
Soil and Fertility Management Services	29	19.0	10 th
Farmer Training and Capacity Building	67	45.0	7 th
Climate-Smart Agricultural Practices	89	59.0	4 th
Access to Credit and Inputs	80	53.0	6 th
Use of Digital Platforms	84	56.0	5 th
Market and Value Chain Linkages	60	40.0	9 th

Source: Field survey, 2025

Distribution of Respondents on their Perception of Extension Services

The results presented in Table 3 show farmers' perception of the use of extension services 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*	1 st
Training from extension agents has increased my cocoa yield	3.3*	2 nd
Extension advice on pest and disease control reduces crop losses on my farm	2.7*	5 th
Extension services help me adopt new technologies more easily	2.7*	5 th
Extension services are accessible and relevant to my farming needs	2.2	8 th
Extension services encourage farmers to form cooperatives	2.8*	4 th
Extension services play a vital role in improving my farm income	2.3	7 th
Inadequate extension services are a major barrier to higher cocoa production	2.7*	5 th
Lack of regular visits by extension workers reduces the benefits I gain	2.5*	6 th
Extension services encourage farmers to form cooperatives	3.1*	3 rd

*Mean values above critical value of 2.5

Source: Field Survey, 2025

Constraints to the Utilisation of Extension Service by Cocoa Farmers

The results of the constraints to the utilization of extension services by cocoa farmers in Ikom agricultural zone show 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. Agbongiarhuoyi *et al.* (2010) also highlighted education as a constraint, observing that farmers with low literacy levels were less likely to adopt improved cocoa production practices. Akinbile and Ndaghu (2005) also documented the high cost of accessing services, noting that the financial burden of training and input procurement often discouraged smallholder farmers from fully utilising extension services. Furthermore, Agbam (2011) emphasised that Nigeria faces a serious extension agent-farmer ratio crisis, with one agent often serving over 3,000 farmers, thereby constraining effective outreach and personalised advisory services.

These findings imply 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 the Utilization of Extension Services by Cocoa Farmers ($n = 150$)

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

*Mean values above critical value of 2.5

Source: Field Survey, 2025

CONCLUSION

This study assessed the utilisation 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 utilise extension services. Key extension services included the 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 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, political and institutional instability, poor funding, low literacy among some farmers, high service costs, and inadequate extension personnel constrained utilisation. 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 adequate funding.
3. Farmers' cooperatives should be promoted and strengthened to enhance knowledge sharing.

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